

ARC13

Assessment of Research and Coproduction
at Mid Sweden University 2013



Mittuniversitetet

MID SWEDEN UNIVERSITY

ARCI3

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Mid Sweden University
Holmgatan 10
851 70 Sundsvall
www.miun.se

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Preface

High quality research and knowledge development at higher education institutions are of central importance to the long-term development of our society. This is why research at Mid Sweden University is so important, not only for the university itself, but also as a part of a greater scientific context and as a part of the surrounding society.

The last ten years have been characterized by a major growth in the field of research, both in terms of resources and productivity. Today, research is conducted within a relatively large number of subjects as well as within the seven research centres of the university. The demands on the research environments of the university are high. The academic quality must be internationally competitive at the same time as the research needs to be relevant to the development of society and the demands of the first-cycle courses and study programmes of the university.

In order to handle future challenges in a better way, to identify areas of improvement and to strengthen the international position of the university, an assessment of all research conducted at the university is an important part of the Research Strategy 2012–2016. The assessment covers the years 2007–2012 and is called Assessment of Research and Coproduction, ARC13.

In this book, the result of the assessment is presented together with the reports of the expert panels. The material shows that overall, the quality of research at Mid Sweden University is good and that we have been successful in our ambitions to conduct research in close cooperation with public and private organizations. The assessment, combined with the quality and development work that follows from it, will provide us with important prerequisites to be able to strengthen our international position as a university and at the same time increase the benefits of our research.

I look forward to the work that will follow and I would like to take the opportunity to thank all the employees of the university and the experts from around the world who have made the assessment and the reports possible.

Mid Sweden University in April 2014

Anders Söderholm, Vice-Chancellor

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1. Executive Summary

During 2013, Mid Sweden University performed an assessment of its entire research, Assessment of Research and Coproduction, ARC13. The two main purposes of ARC13 are to serve as a reference for strategic decisions on future research profiles at the university and for the quality development of the research environment.

ARC13 aims at identifying strong areas of research. As such, ARC13 will provide means to strengthen the quality of these scientific activities by offering reliable background material for future strategic decisions. The evaluation will also support the research units in their work on formulating plans for future research. The evaluation is aimed at assessing the performance and prospects of the whole research unit, not of individual scientists.

Mid Sweden University divided its research into 33 Units of Assessment (UoAs) that were grouped together in 9 research fields. Each UoA made a self-assessment consisting of three parts; strategic information about the UoA including SWOT analysis, quantitative data describing the UoA and two case descriptions identified by the UoA as particularly important or significant (Impact Cases).

An international scientific evaluation panel, one for each of the 9 research fields, undertook the evaluation of each UoA within the corresponding research fields regarding scientific quality and societal relevance. Among the UoAs, 7 research centres represent research in Mid Sweden University's profile areas. These research centres also serve as a platform for collaboration with financiers and other interested parties. Besides their scientific quality and societal relevance, an international generalist evaluation panel assessed the relevance of the research centres for the mission of the university from a cross-disciplinary perspective.

In total, 45 evaluators (roughly 50% female and 50% male evaluators) from 14 countries were engaged in the 10 evaluation panels. Based on the self-assessment report and site visits, each evaluation panel documented their findings in an assessment report for each UoA, see chapter 4.

In general, there is a positive outcome from the panel reports. The international generalist evaluation panel concludes that all research centres contribute to a high extent to the regional mission of the university. In addition, all research centres show strong applied research and has well developed networks. Some of the UoAs have received the top grade "excellent" on their scientific quality and relevance, and several of them received the grade "very good" and "good". It can be noticed that in general, the outcome of the UoAs that strictly fits into one discipline is slightly better than that of the cross-disciplinary UoAs. This might be a result of the evaluators being chosen based on their disciplinary merits. Overall, the Mid Sweden University researchers show high competence and are judged as very productive.

ARC13 has also identified areas of improvements. Such an area is strategy and

the need to better formulate and implement visions, strategies, goals etc. in the daily activities. Another observation from the expert panels is that, with a few exceptions, the UoAs are small. One way to grow is to be more attractive and therefore be more likely to receive external funding from non-traditional financiers like the Knowledge Foundation and the EU regional funds. This might imply that basic science needs to be more considered as a complement in the applied projects. The expert panels also stressed the need for more PhD students.

As a part of the evaluation process, Mid Sweden University also performed analysis of the bibliometrics, financing, and the Impact Cases reported in the self-evaluation by the UoAs. The bibliometrics covered the years 2007-12. Over 4000 publications from authors affiliated with Mid Sweden University were registered in DiVA during the period of interest. About 50% of the publications origin from the Faculty of Human Sciences and 50% from the Faculty of Science, Technology and Media. Most of the UoAs publish the majority of their articles in peer-reviewed journals. It was also noticed that the most commonly used database, Web of Science, is less representative to the research activities at Mid Sweden University for ranking purposes. The visibility of the database is less than 30%, implying that the major part of the publications from Mid Sweden University is found in channels not covered by Web of Science. However, half of the UoAs show a visibility above 50% in the Norwegian list, implying that the majority of the publications are published in channels relevant to the discipline.

It is obvious from the financial analysis that governmental grants is the most important source for research funding at Mid Sweden University, although grants from the EU, Swedish foundations and other public bodies contribute as well. Some of the UoAs show substantial financing from the Research Councils, indicating a high scientific quality of the research performed and addressed. Furthermore, the reported impact cases demonstrated a wide scope of impact areas ranging from wealth creation, changing practices and collaboration with large companies via improving social cohesion and start-ups to societal values, policy making and risk and safety, covering all research fields of the university.

In conclusion, ARC13 has provided a deeper insight into the university's strong areas and research environment, which was the aim of the assessment. The input from the international evaluation panels has formed a platform from which the university can set its future strategy and make the critical decisions needed to further develop and shape the university to be an active player that solves future societal challenges.

2. Introduction

2.1 Mid Sweden University in Brief

Mid Sweden University was established in 1993 when the university colleges of Sundsvall/Härnösand and Östersund were merged. In 2005, it became a full status university.

The university is a multi-campus network university with campuses in Härnösand, Sundsvall and Östersund. In total, Mid Sweden University hosts 15 000 students and offers 35 Master’s programmes, 45 study programmes and 550 independent courses. Around 1 000 persons are employed by the university, out of which 95 are professors and 215 graduate students. In 2013, the turnover was 932 MSEK, out of which 371 MSEK were related to research.

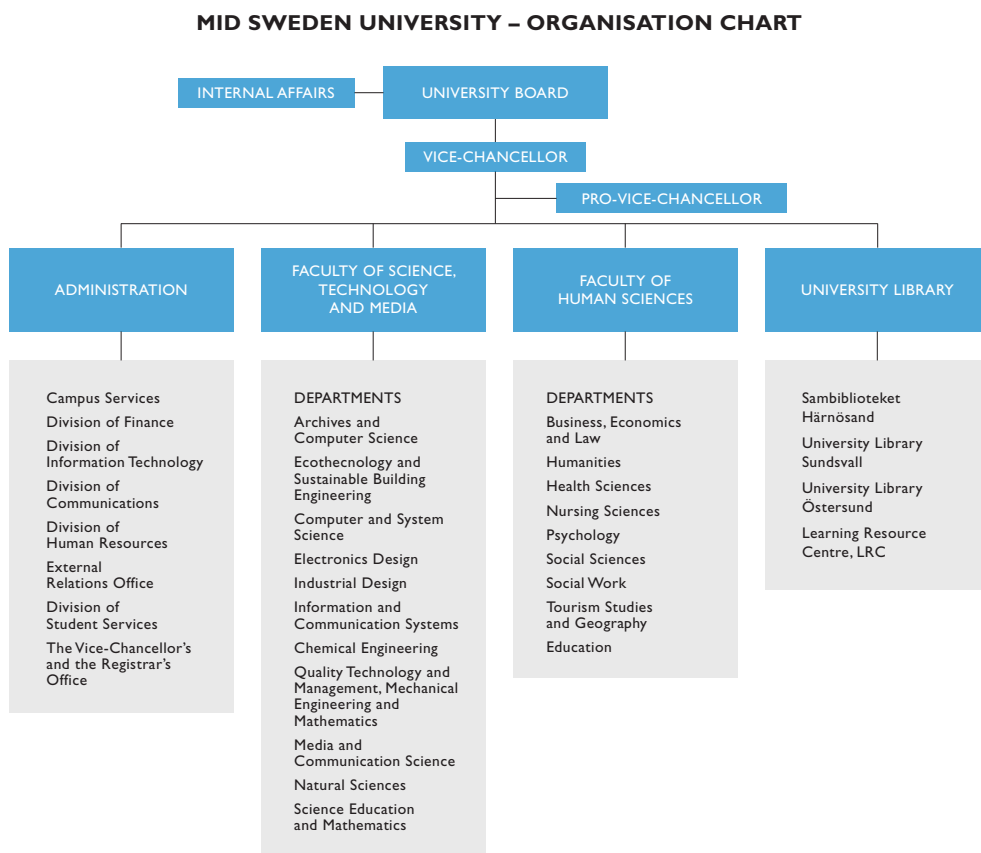


Figure 1: Organisation Chart – Mid Sweden University

First- and second-cycle courses and research are organized under the two faculties: Faculty of Human Sciences and Faculty of Science, Technology and Media. Research and collaboration with trade and industry and different organizations are important parts of the activities as it provides the students with an education close to reality and valuable placements. Mid Sweden University also focuses on e-learning and distance education, which makes higher education a possibility for more people.

In terms of research, Mid Sweden University has profiled areas in which it has an extensive commitment. All three campuses offer first- and second-cycle courses and research in at least three of these areas. This enables Mid Sweden University to develop a high level of competence within the chosen fields, which makes the university more competitive. This profile also gives Mid Sweden University a clearer role in the research community.

The research at Mid Sweden University is organized in research centres and scientific disciplines. It is the mapping of these 7 research centres and 26 scientific disciplines that constitute the 33 Units of Assessment (UoAs) in the Assessment of Research and Coproduction 2013 (ARC13), see Table 1. The research centres are the centres for research in the profile areas and some other research areas, but they also serve as a platform for collaboration with financiers and other interested parties.

Research Field	UoA	Subject/Centre
1. Economic Sciences,	1.1	<i>CER, Centre for Research on Economic Relations</i>
Law and Tourism	1.2	<i>ETOUR, The European Tourism Research Institute</i>
	1.3	Business Administration
	1.4	Economics and Statistics
2. Health Sciences	2.1	<i>SWSRC, Swedish Winter Sports Research Centre</i>
	2.2	Sport Science
	2.3	Public Health
	2.4	Nursing Sciences
	2.5	Rehabilitation Science
3. Social Sciences	3.1	<i>RCR, Risk and Crisis Research Centre</i>
	3.2	Sociology and Gender Studies
	3.3	Criminology
	3.4	Political Science
4. Humanities	4.1	English
	4.2	History
	4.3	Literary Studies, Religious Studies, Spanish, Swedish Language
5. Behavioural Sciences	5.1	Social Work
	5.2	Psychology
	5.3	Education
6. Media and	6.1	<i>DEMICOM, Centre for Study of Democracy and Communication</i>
Communications	6.3	Quality Technology and Management
	6.4	Information Systems
7. Engineering Sciences	7.1	<i>FSCN, Fibre Science and Communication Network</i>
	7.2	Chemistry
	7.3	Chemical Engineering
	7.4	Mathematics
	7.5	Sports Technology
	7.6	Engineering Physics
8. Computer and	8.1	<i>STC, Sensible Things that Communicate</i>
Information Sciences	8.2	Computer Science
	8.3	Electronics
9. Biology and	9.1	Biology
Environmental Sciences	9.2	Ecotechnology and Environmental Science

Table 1: Overview of the research at Mid Sweden University divided into research centres (bold italic style) and scientific disciplines (normal style)

Mid Sweden University has an important role to play in the development of the surrounding region. The university has close links with trade and industry, local and governmental authorities, and other bodies in the region. This cooperation is important to the development of Mid Sweden University and its ability to contribute to the development of the region.

2.2 Background to ARC13

Mid Sweden University states in its document *Research Strategy for 2012-16* that a review of the profile areas will be undertaken during this period. In addition, the need for a deeper understanding of the research environments within the scientific disciplines is stressed.

The starting point for ARC13 was that the assessment process itself should be quality driven. This means that the researchers were requested to take an active part in the preparation, reflect on their own research and the feedback given in ARC13 as well as in discussions in connection with the feedback given. All activities within ARC13 should be focused on a positive future development. The two main purposes of ARC13 are to serve as a reference for strategic decisions on future research profiles at the university and quality development of the research environment, especially on the third-cycle level. ARC13 aims at identifying strong areas of research in the broad spectrum of research at Mid Sweden University. As such, ARC13 will provide means to strengthen the quality of the scientific activities at the university by offering reliable background material for future strategic decisions. Furthermore, the evaluation will support the various UoAs when formulating plans for future research. The evaluation is aimed at assessing the performance and prospects of each UoA as whole, not of individual scientists.

The preparation for ARC13 started in 2012 and the assessment took place in 2013. ARC13 was partly financed by the Knowledge Foundation and the overall planning was done in cooperation with Halmstad University and University of Skövde, under the direction of a common steering group that coordinated the implementation. This means that the three universities had the same process and documentation, see section 2.3 for an overview of the process. This implies that the indicators for scientific quality and coproduction were substantially the same. Another consequence was that it was decided that external evaluation panels should assess each UoA and document their findings in an assessment report for each UoA, based on the self-assessment report each UoA provided, quantitative data, and site visits. In order to be able to recruit international evaluators, it was decided that all documentation should be written in English. However, each university was in control of and responsible for its own evaluation.

2.3 Overview of the ARC13 Process

ARC13 should be looked upon as a learning process for Mid Sweden University from several perspectives. It also has an impact that will last much longer than the ARC13 process. The ARC13 process itself ends with the publication of this book. However, Mid Sweden University has already started several follow-up processes, such as discussions with each UoA about the recommendations given in the panel reports, see chapter 4. An overall timeline for the ARC13 process is given in Table 2. Details of the ARC13 process are explained below.

	2012		2013												2014			
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Planning																		
a. Coordination with HH ¹ and HIS ²																		
b. ARC13 Management																		
c. Production of Evaluation Package																		
d. Planning of Overall Process																		
e. Planning of the Bibliometry																		
Preparation																		
f. Self Assessment Reports																		
g. Bibliometric Production																		
h. Recruitment of Evaluators																		
Execution																		
i. Evaluators Preparation																		
j. Site Visit Week																		
k. Panel Evaluation Report Writing																		
l. Analysis																		
m. Preparation of the ARC13 Book																		

¹ Halmstad University

² University of Skövde

Table 2: Overview of the ARC13 process.

2.3.1 Planning

The initial phase of the ARC13 process was characterized by a number of planning meetings with the common steering committee in order to synchronize ARC13 with the assessments at Halmstad University and University of Skövde. Three common working groups were established, focusing on scientific criteria (the scientific group), indicators for coproduction (the coproduction group), and bibliometrics (the bibliometrics group). The group representatives are listed in appendix D.

Simultaneously, the organization for ARC13 at Mid Sweden University was put in place. It consisted of the Mid Sweden University steering committee, chaired by the Vice-Chancellor, the start-up team, the general working team and the editorial team. The participants are presented in appendix E.

One result of the cooperation with Halmstad University and University of Skövde, see section 2.2, was the common production of an evaluation package, instructions to the experts of ARC13, and the grading scale, see appendix A-C. Besides these common documents, Mid Sweden University also decided on the research fields and related UoAs for ARC13, see Table 1. Based on this classification, the planning

of the site-visit week was initiated, guidelines for the recruitment of evaluators were formulated and the bibliometric planning and programming began.

In bibliometry, an affiliation based approach was used, meaning that publications during the period 2007-12 affiliated with Mid Sweden University were taken into account. The citation studies were based on publications during the period 2005-11. In order to give a wide perspective on bibliometry, several methods and databases were used such as DiVA, Norwegian list, Web of Science and the Karolinska Institute subset of Web of Science. More details on the bibliometry are given in "Appendix A – ARC13 Evaluation Package" and "Appendix F – Definitions of Bibliometric Indicators Calculated by the University Library". It was noted that Halmstad University and University of Skövde both used a researcher based approach, implying that the calculated indicators are difficult to compare.

International scientific evaluation panels (ISEP), one for each research field, undertook the scientific assessments. A unique feature for ARC13 was the international generalist evaluation panel (IGEP) that evaluated all the seven research centres and their relevance for the mission of the university from a cross-disciplinary perspective, as well as on non-scientific aspects like financing, organization, cooperation etc, since these centres are thought of as the face towards the surrounding society; see "Appendix G. Instructions to the Generalists ARC13". This also implied that the IGEP performed evaluations of several research fields and therefore, they could share their findings with the respective ISEP.

Besides sufficient scientific qualifications, Mid Sweden University also aimed at having evaluators that, as a group, showed:

- a sound gender balance
- representatives from different countries
- a mixture of younger and older evaluators

All in order to get a broad perspective on the research at the university.

2.3.2 Preparation

Each UoA was asked to suggest 5 scientific evaluator candidates and 5 candidates with a more societal background. Based on these suggestions, 10 evaluation panels were formed where roughly 50% of the evaluators were among those proposed and 50% were found in other ways. This was done in order to make it possible for the UoAs to propose candidates that are well established experts in their specific areas of research and to whom the UoAs, for different reasons, wanted to present their research to or receive new input from. A multi-step process coordinated by the University Library was used in order to secure that there was no conflict of interest between the evaluated UoA and each evaluator, see Appendix H: Conflict of interest". Furthermore, the UoA had to approve the final evaluation panels in order to secure that no personal conflicts existed between the UoA and the selected evaluators. There were no objections.

In total, the 10 evaluation panels (9 International Scientific Evaluation Panels and 1

International Generalist Evaluation Panel) consisted of 45 evaluators, see “Appendix I. International Evaluation Panels”, out of which 21 (47%) were female and 24 (53%) male, see Figure 2. Out of the ten evaluation panels, 5 (50%) were chaired by female evaluators and 5 (50%) by male evaluators, which implies a proper gender balance.

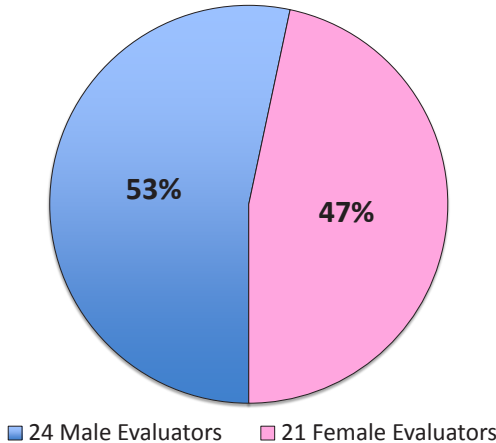


Figure 2: Gender balance between the evaluation panellists.

The 45 evaluation panellists came from 3 continents and 14 countries, see Figure 3. United Kingdom contributed with the most panellists, 7 persons, followed by Finland, Sweden, and USA with 6 persons each. All Swedish evaluators were chosen because of their societal background and knowledge, not on their scientific merits. This seems to be a fair number of countries represented in the evaluation panels. It could be noted that our neighbour country Denmark is not represented, although several Danish scientists were invited.

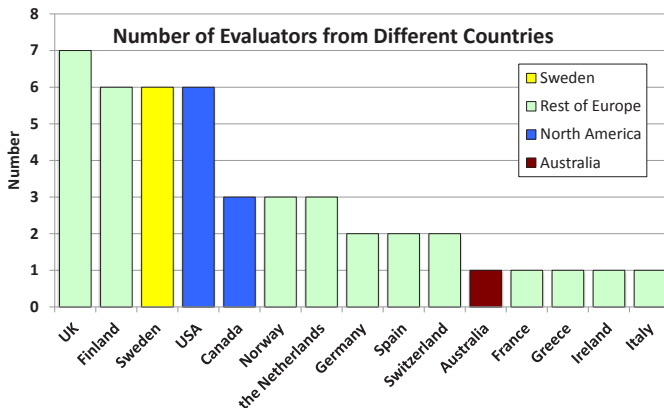


Figure 3: Number of evaluators from different countries and continents.

In accordance to the instructions given, 33 self-assessment reports were produced as input to the evaluation panellists - one from each UoA. In addition, more than 10.000 values on bibliometric indicators were produced and reported to the evaluation panellists. The bibliometric indicators calculated are summarized in “Appendix J. Main Bibliometric Data”.

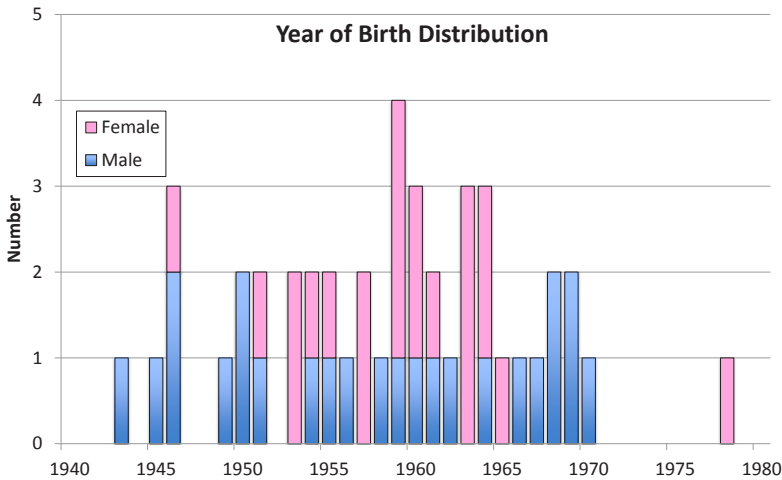


Figure 4: Year of birth distribution among the evaluation panellists.

2.3.3 Execution

Due to the fact that there are three campuses at Mid Sweden University (Härnösand, Sundsvall and Östersund) and also due to the introduction of a international generalist evaluation panel, the logistics of the site-visit week was complicated. Each research centre was first evaluated by its scientific evaluation panel and prior to the generalists assessment session, the international generalist evaluation panel, IGEP, met with the international scientific evaluation panels , ISEP, to learn about their findings so far. The IGEP chair headed the generalist assessment sessions with the ISEP participating in the session. After the session, the IGEP and ISEP met to share their impressions of the session and the performance of the research centre. In general, all UoAs, including the research centres, met with their ISEP for 3 hours, while the IGEP met with each of the research centres for 2 hours. A first draft of the evaluation report from each evaluation panel was produced during the site visit week and preliminary results were reported to the Vice-Chancellor on Friday afternoon during the site visit week. Deadline for the delivery of the final evaluation panel reports to Mid Sweden University was January 24, 2014. These reports are presented in chapter 4 of this book. Table 3 gives an overview of the logistics during the site visit week.

2.4 ARC13 and beyond

ARC13 is an important part of the university's research strategy and will certainly be included in the renewal and continuous improvement of research and postgraduate education. During December 2013 and spring of 2014, the two faculties met with all of the UoAs to discuss the results and experiences from ARC13. After processing and analysing the reports, an action plan will be developed, integrating the ambitions of the research strategy and the experiences from ARC13. The implementation process will be discussed and supervised by the Vice-Chancellor's steering group.

3. Summary of Some Findings from ARC13

This chapter deals with some findings observed in ARC13. Basically, it summarizes the evaluation panel reports for each UoA. In addition, the chapter reports on the deeper analyses performed on bibliometrics, financing and impact cases associated with ARC13.

3.1 General Impressions and Comments on the Evaluation Reports

The assessment in ARC13 has been performed from two perspectives:

- The international scientific evaluation panel perspective with the objective to assess the scientific quality and societal relevance of each UoA.
- The international generalist evaluation panel perspective with the objective to contribute to the institutional strategy of Mid Sweden University in the next 5-10 years by assessing the contribution of the 7 research centres.

Below are the summaries of the findings from these assessments. The scientific summaries are performed by the faculty and approved by the UoAs evaluated.

3.1.1 The International Generalist Evaluation Panel Perspective

The international generalist evaluation panel developed seven critical success factors that correspond to the role of the research centres in the profile of Mid Sweden University. These factors are:

1. Average scientific quality as reported by the expert panels
2. Number of thesis by Lic and PhD students
3. Cooperation with local industry and organizations as reported by the expert panels
4. National and international recognition
5. Bundling of research
6. External funding
7. Recruitment

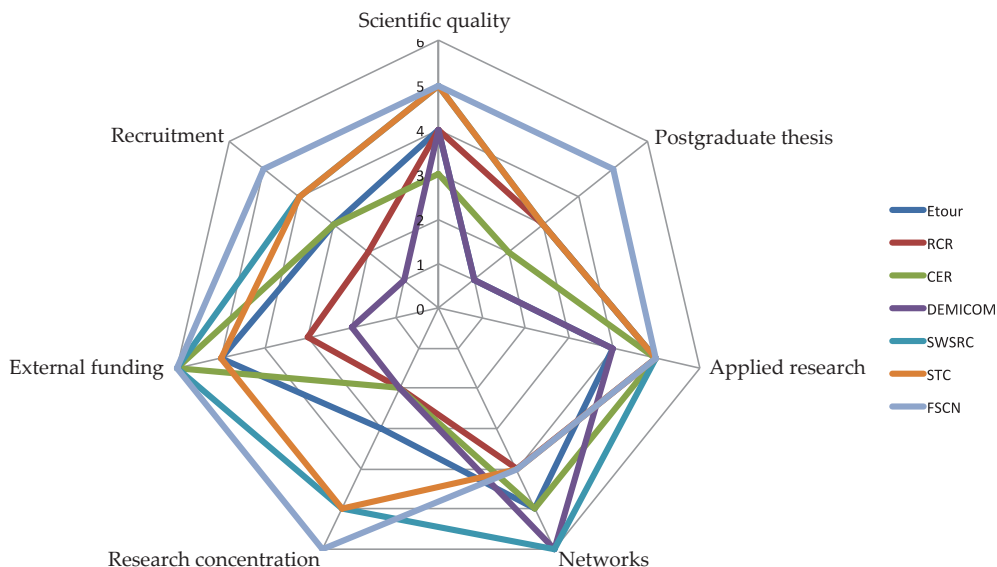


Figure 5: Overview of the strategic potential of the research centres at Mid Sweden University.

These factors are evaluated on a scale from 1 (=strong underperformance) through 6. The result was visualised in a radar diagram, see Figure 5. The estimation of factor 2 was based on both absolute figures of PhD theses produced at the center and the ratio between staff and theses. This estimation result in an underestimation of the productivity for centers with many PhD students and Master students in relation to staff. The overall conclusion is that all research centres contribute to a high extent to the regional mission of the university. In addition, all research centres show strong applied research and have well developed networks. Further strengths and weaknesses of each research center are shown in Figure 5.

3.1.2 The International Scientific Evaluation Panel Perspective

Below is a summary of the international scientific evaluation panel reports regarding scientific quality and relevance for each UoA.

UoA 1.1 Centre for Research on Economic Relations, CER

The expert panel concluded that the overall quality and productivity of the unit CER was “very good”, stressing in particular that many of the papers published by CER are in high quality journals. CER’s networks and collaborations with the surrounding society were “excellent” and the impact on society was rated as “very good”.

CER is the youngest research unit at Mid Sweden University and it has the smallest financial resource base. Consequently, the number of researchers is also limited. CER's future strategy underlines keeping up and further developing both the production of internationally valuable knowledge and benefits for their network partners in the surrounding society. A national and international book production is underway, including chapters provided by researchers from CER and seven other Swedish universities as well as international researchers. The panel also noticed an increasing interest in including CER as a partner in regional networking activities.

UoA 1.2 The European Tourism Research Institute, ETOUR

The expert panel concluded that the overall quality and productivity of ETOUR was "very good", with highly committed and productive staff. ETOUR has also been very successful in attracting external funding and shows very good results in terms of academic and private as well as public industry networking. Furthermore, coproduction of research, rated as "excellent", is a strong and successful tradition at ETOUR, resulting in a very good impact on society.

The evaluation report concludes that the field of tourism is large, growing and of high relevance for the region, the country and internationally. One strategic challenge is, however, to deal with tourism as a multidisciplinary and applied research field and the implications this has on attracting external funding. Therefore, a continued priority is to work with opportunities for research collaborations, both academic and industry, as well as to make efforts to maintain and further develop tourism education and research as a profile area within the university.

UoA 1.3 Business Administration

The expert panel concluded that the overall quality and productivity of research was "good" and that some of the research qualifies for the grade "excellent". The unit was described as having a considerable research expertise in auditing (located at CER), entrepreneurship, and marketing. Some of the professors have an international reputation and the overall societal impact was graded as "very good". The expert panel described the coproduction as "excellent" on account of the major research projects are organized around coproduction with both academic and non-academic external partners.

The expert panel addressed the potential of the unit and suggests a breadth of core business research and the development of a long term plan for the research.

UoA 1.4 Economics and Statistics

Expert evaluation was not performed due to the absence of self evaluation report.

UoA 2.1 Swedish Winter Sports Research Centre

The expert panel concluded that the overall quality and productivity was "excellent", with special developed methodologies. The experts state that this is not usual in

the sports sciences area in which most laboratories limit their investigations to the lab as a result of the difficulties in making data acquisition in outdoor conditions. The productivity is concluded to be “very good” as well as the research networks, coproduction and impact on society. The unit staff members publish their work in international recognized journals with high impact factors.

The expert panel addresses the recommendation to increase the number of PhD students and permanent staff and also to incorporate fundamental research into the overall agenda to be able to analyze the mechanisms that could explain their applied results.

UoA 2.2 Sport Science

The expert panel concluded that the overall quality and productivity of the unit was “very good”. The unit is well recognized at an international level for the methodological expertise, for the applied research and for the laboratory facilities. The research networks and infrastructure of the units were also graded as “very good”, as well as the impact.

The expert panel identifies one of the key challenges for the unit to be attracting externals funding in order to strengthen the PhD programme, finance post-doc positions and enable more research time for lecturers.

UoA 2.3 Public Health

The expert panel concluded that the overall quality and productivity of the unit was “good”. The research of the unit has reached national and international recognition. The research networks and collaborations are rated “very good” due to collaborations on a national and international level. It is also concluded in the report that the impact of the research on society is good and the DISA method is a proof of that.

Public health is prolific in research and in areas that are central for the discipline. Additionally, the research is local, national and international. The UoA publishes in peer-reviewed journals, often with international partners. The UoA is an attractive partner for collaboration and research which shows in the number of collaborations and the large number of PhD students. Public health has no problem recruiting supervisors either.

UoA 2.4 Nursing Sciences

The research within the unit is centred around four key themes: reproductive health-childhood and youth; mental health nursing; older people nursing care; medical and surgical nursing care. The overall quality of the research and productivity is concluded by the expert panel to be “very good” and “good”. It is concluded by the experts that much of the work done by the unit has international visibility. The unit’s impact on society is also graded as “very good” and many of the researchers

function as experts in different national groups in the field.

The expert panel also concluded that it needs to develop its coproduction, strategies and plans for the future.

UoA 2.5 Rehabilitation Science

The unit focuses on vocational rehabilitation and health in working life. It brings together multiple disciplines and mixed methods to address complex research questions about how work and life intersect to produce outcomes for individuals and society. The overall quality of the research of the unit is concluded by the expert panel to be “good” and the productivity “very good”. Both research environment and infrastructure and research networks are concluded by the experts to be “very good”. In the report, the research group at the unit is described as a group with a great potential to grow due to the collegial atmosphere, strong leadership, energy, openness to change and the respectful working environment. To achieve growth, this unit needs to develop its strategies and plan the future.

One important strategy is to focus future research and development projects and research outputs to some of the mentioned areas above, for example models concerning vocational rehabilitation, vulnerable and marginalized groups such as self-employed, unemployed and sick-listed young people and female employees in specific sectors in working life, and division of labour/work-family balance. It is also necessary to complement the individual-based vocational rehabilitation research with health and rehabilitation issues at an organizational level. The opinion of the experts is that research in these areas has the potential to be important for actors in society and the capacity to be recognized nationally and internationally.

Another important issue is to recruit more research assistants and senior researchers, which may be possible if the unit collaborates with the other two units of the department, public health and sport science. The unit also plans to strengthen the cooperation with researchers in on-going international EU projects as well as on-going collaborations with universities in Norway, Ireland, USA and Australia. A strategy is also to contribute to the development of the network for working life research at Mid Sweden University (named NAFS) and to participate in other rehabilitation and health research networks at a national and international level.

UoA 3.1 Risk and Crisis Research Centre

The RCR provides an interdisciplinary focus on the study of risk and crisis in relation to social issues and societal challenges, which makes the RCR stand out as distinct from other traditional research hubs where the tendency is to adopt a psychological or technical perspective. The RCR is based on work within computer science, informatics, law, political science, and (primarily) sociology. The expert panel did not rank the RCR individually but referred to the centre in the evaluation of the Unit of Sociology and Gender Study, where it is concluded the overall quality of research

as ranging from “good” to “very good”, and with evidence of some work being “very good” to “excellent”, especially in the risk and crisis and gender studies areas. In the sociology and gender study section, it was also stated that the productivity of the RCR is “very good” to “excellent”. The unit also has strong research networks and collaboration with external partners on a regional, national and international level.

The expert panel addresses the potential for the unit being more strategic, targeted, and attaching greater weight to the research centre’s strategic mission in the future.

UoA 3.2 Sociology and Gender Studies

The unit has three distinct research foci, including risk and crisis research, gender studies, and working life. The overall quality of research at the unit is concluded to range from “good” to “very good”, with some of the work being “very good” to “excellent”, especially in the risk and crisis and gender studies areas. The faculty in the Sociology and Gender Studies Unit has also been quite productive in terms of their publication record. The number of peer-reviewed publications in journals has been significant. The research collaborations with external partners are significant. The expert panel also addresses some areas of potential development, such as the channels for publication, and advises the unit to consider the balance between applied/practical vis-à-vis theoretical research.

UoA 3.3 Criminology

The Mid Sweden University Criminology Unit is a research programme within the Department of Social Sciences. The unit defines itself as doing “applied criminology” with a focus on managing and assessing risk of violence. The overall quality of research conducted by the unit is concluded to range from “good” to “very good”. There is also evidence of high levels of productivity as measured in terms of publications. The UoA has also very well established research networks with other key researchers and universities within the field.

The expert panel concluded that one of the main challenges for the unit is to broaden its research focus in order to engage with the key debates and issues of the discipline. It is understandable that the expert panel concludes that the main challenge for the criminology unit is to broaden its research focus with key debates and issues of the broad criminology discipline, since their evaluation is done with the presumption that the criminology unit has strived per se to be a traditional criminology unit within the Department of Social Sciences. However, the criminology unit has very clearly, already from its start, aimed at the opposite direction, i.e. not to be a traditional criminology unit within the social sciences. Having had its base at the Department of Health Sciences, and in line with the fundamental values of Mid Sweden University, e.g. “We are also convinced that a reality-based education and research in close cooperation with the surrounding world produce noticeable results”

(see About Mid Sweden University, www.miun.se), the criminology unit has very clearly strived towards an applied and reality-based approach (e.g. violence risk assessment, where several state-of-the-art, and the most commonly used violence risk instruments in the world, have originated in part from the researchers at the criminology unit). Thus, the unit has no intention to take another direction than the one that so far evidently has been very successful – both concerning being attractive to students and (which is uncommon within other criminology departments in Sweden) in producing research of high practical value in high impact international scientific journals.

UoA 3.4 Political Sciences

The overall quality of the research produced at the UoA was concluded to range from “good” to “very good” and in some cases even “excellent”. The expert panel also concluded that the researchers at the UoA publish their work in high impact journals. The UoA has well established international research networks.

The expert panel recommends that the UoA carries out a fresh strategic review to take account of the different staff complement and develops its collaboration with other units at the department.

UoA 4.1 English

The evaluation panel rated the overall quality of research “very good”. The research was found to be original and of high quality. The productivity is “very good” at the unit as are the research networks and collaborations. The coproduction and external non-academic cooperation was also concluded to be “very good” as was the impact of the research on society.

The recommendation for the future of the unit is to enlarge the PhD group to five permanent PhD positions and in order to be able to distribute more research resources.

UoA 4.2 History

The expert panel concluded that the unit has produced very high quality research and it was graded as “excellent”. The quality and originality of the research published in the period under assessment has impressed the panel, in particular in military and political history. The productivity of the unit is also graded as “very good”, as well as the research networks and collaboration and the impact on society. The strategies and plans for the future are concluded to be “excellent”.

The conclusions of the expert panel acknowledge the analyses undertaken within the UoA regarding its strengths, weaknesses and a possible future. It should be noted that several of the goals put forward has now already been achieved; The UoA has been granted a substantial amount of external research money for “Forestry”, formally acknowledged as the host of the Swedish Consortium of History in 2017, and it is currently recruiting a new chair-holder, opening up for female applicants.

The evaluation undertaken confirms that the hitherto strategy of the UoA with its rather varied research interest has been very successful. The future strategy is to maintain this very strong position of the UoA by developing it further in terms of a more focused research interest in certain fields as well.

UoA 4.3 Literary Studies, Religious Studies, Spanish, Swedish Language

The expert panels concluded that the overall quality of research produced at this unit is “very good” in general, as well as the productivity. It reveals that the researchers have a good knowledge of previous scholarships and the state of research in their fields. The unit has good networks and collaborations and strong relationships with other institutions and non-academic entities. The experts also graded the impact on society for the unit as “very good”.

As stated in the assessment, the panel of experts insisted that each one of the subjects, namely Comparative Literature, Spanish, Religious Studies and Swedish Language, should offer its own doctoral studies programme. The panel also recommends an increase in personnel for each subject, and particularly more tenured staff. The ambition is, of course, that sufficient resources be allocated at the appropriate levels in order to make it possible to establish doctoral studies programmes in each one of the subjects. This could be done in cooperation with other universities.

UoA 5.1 Social Work

In the report, the expert panel addressed the potential of the unit as being national and international leading within certain areas. To reach that position, the unit needs to develop its strategic vision and plan for the future, develop its PhD programme and increase its visibility at international conferences.

Furthermore, the expert panel recommends that a Research Centre on International and Intercultural Research be developed, ideally within the university and definitely within the department, to highlight and promote projects and to seek major funds. These themes are core to internationalizing research in an era of globalization and transnationalism. Such a research unit will provide a strong brand for Mid Sweden University, nationally and internationally. Given the focus on internationalizing higher education within major universities around the world, DSW has already achieved significance in this area and can help to build the infrastructure at Mid Sweden University. This UoA is innovative, the research is solid and there is potential for the unit to develop an integral approach to structural discrimination, globalization and social inclusion for the university.

UoA 5.2 Psychology

The overall quality research output is concluded by the expert panel to be “very good” with evidence of some publication output being of excellent quality. The productivity is also rated as being “very good” at the unit. The research networks

and collaboration as well as coproduction and external cooperation are rated as “good” with evidence of some collaborations and coproduction being “excellent”. The summarized overall rating of the different rated parts in the evaluation of the unit is “very good”.

To take the next step, although giving evidence of very good capacity building, the Department of Psychology is in need of developing a stronger infrastructure. However, in order to fully realize this, a clear institutional support would be needed. The expert panel also addresses the importance of developing strategies and plans for the future research. The unit has developed plans involving research directed towards “experimental psychopathology and intervention”; the suggestion of a research centre is, from an institutional level, not viable. Nevertheless, the unique path chosen and the competence regarding experimental and interventional research, vouch for a creative and productive future. This would also ensure a greater capacity for impact on the society.

UoA 5.3 Education

The summary and the report have been omitted due to a delay in the evaluation process.

UoA 6.1 Centre for Study of Democracy and Communication, DEMICOM

DEMICOM conducts top quality research on different aspects of democracy and communication in the digital age. The overall quality of research output is rated as excellent and the evaluation panel concluded that the overall productivity of the centre is excellent with an equally excellent general societal impact. The senior research team is exceptionally strongly represented in various government committees as standing experts, and scholars from DEMICOM are frequently approached to serve as experts in national media.

The evaluation confirms the hitherto very successful strategy to combine the highest scientific goals of excellence and a high level of presence in national public debate. The new strategy plan needs to be more focused and clear on external funding activities and possibilities in order to increase the number of external research projects significantly in the near future. The centre is perceived as a showcase of excellent research and its close networks with national policymakers has high potential to contribute to the profile and political weight of the university.

The panel also addressed the potential for more PhD students and the need to secure long-term funding for this. The recruitment of PhD students will be of highest priority for DEMICOM in the forthcoming years.

UoA 6.3 Quality Technology and Management

Quality Technology and Management is a small and tight research group, which, despite being relatively young, produces research of high quality and takes a

solid position as one of the national top research groups within the field. They are exceptionally strong in coproduction, especially on a regional and national level. There are potentials of taking national leadership within the area, and for a much stronger international impact.

To develop further, the group needs stronger and more focused leadership and the strategy, although already very good, needs further improvement towards international cooperation, wider publication spread, research council funding and career advancement of junior researchers.

UoA 6.4 Information Systems

The Information Systems Unit produces research of very good quality. The productivity is high and the research outcomes are published in a broad variety of channels, of which a majority in peer-reviewed journals and conference proceedings. The research is nationally, and in some cases internationally, well recognized and the unit is engaged in a number of national and international academic networks of good quality. The unit collaborates with a wide range of high quality non-academic partners for whom, the evaluation panel concluded, it is evident that the research is of high value.

The unit consists of four autonomous research groups with varying focus and perspectives of research. The groups need to establish a clear structure for leadership and infrastructure, a clear vision of research, and a coherent strategy for the unit as a whole to optimize the development of the research. The unit also needs to secure long-term external funding from research councils in order to fully meet the unit's potential of theory-based research.

UoA 7.1 Fibre Science and Communication Network, FSCN

Fibre Science and Communication Network, FSCN, is a research centre within the university's profile area Forest as a Resource. The centre is nationally and internationally well recognized, bringing together board expertise and excellent infrastructure to create a critical mass and relevant research strategy and direction. It has exceptionally strong coproduction and impact on the traditional paper industry, and holds a unique opportunity for renewal through engineering physics.

FSCN conducts research of very good quality. The production rate is equally very good with a very good production rate. The centre's strategy process works well, being strongly supported by capable members from collaboration companies in the FSCN steering group.

The efforts to refocus FSCN towards advanced biomaterials, non-traditional industrial networks and interaction with industrial design needs to be accelerated. The centre also needs strategies for publication that include both industrial and high-level academic journals to ensure success in a broad range of funding programs and increase international collaboration. The centre also needs to include strategy to evaluate the research programme with future scenario processes, and to further consolidate Mid Sweden University expertise and infrastructure into FSCN strategy.

UoA 7.2 Chemistry

The Chemistry Unit performs innovative research of very good academic quality. The research is nationally, and in some cases internationally, well recognized. Given the group size, the unit is highly productive, with several well-cited publications in high-quality journals.

The mainly fundamental research has also successfully been utilised for patenting and new business openings, for coproduction with regional industry and for collaboration with other, more applied oriented, research groups within the university.

The unit consists of four small, self-managed groups. The groups collaborate internally; however, the interdisciplinary collaboration with other units needs to be further explored. The pros and cons of merging Chemistry and Chemical Engineering need to be considered. The unit also needs to develop a clear plan for a broader funding base for the technical support of the infrastructure, long-term funding, international collaboration and resources for post docs and junior staff members.

UoA 7.3 Chemical Technology

The Chemical Technology Unit produces fundamental and applied research of excellent quality and high impact. The relatively young and highly qualified unit enjoys a very good national reputation and international recognition. The unit has excellent collaboration with the industry and is engaged in good academic networks.

The research environment and infrastructure is excellent, with very good availability of laboratories, pilot plants and industrial production facilities. However, experiments in an industrial setting increase the cost per publications. Furthermore, the high degree of industrial co-production tends to delay and reduce publications. The unit needs to increase publication in chemical engineering journals of high academic quality which would require that even applied projects produce more fundamental knowledge. In addition, the unit needs to increase international collaboration, exchange and mobility.

The high dependence on traditional paper industry R&D is a threat. The group needs a clear plan for how to deal with this. Its strength, however, gives it a good opportunity to become leading in the emerging forest bio-economy. As all of the research of this UoA belongs to FSCN's portfolio, it needs to be clarified to what extent separate strategies are needed for Chemical Engineering and FSCN.

UoA 7.4 Mathematics

The Mathematics Unit consists of four groups that conduct pure and applied research of very good quality and of high impact, with part of the results published in some of the best journals in the field of mathematics. The productivity is rated as "very good", mainly because of a strong qualitative and quantitative publication record.

The evaluators emphasize the importance of mathematics for many areas of research and education; however, it is pointed out that the relatively small size of the group limits the number of research topics and activities.

The unit has good connections to related research units at foreign universities, and the cooperation with NTNU concerning advanced and research courses is applauded. Moreover, parts of the unit have good industrial connections. On the other hand, a lack of mobility is identified in terms of exchange of young researchers with other universities, and a strategy needs to be developed to increase the mobility. There is also a need for a career strategy for assistant professors, and to attract more resources, especially external funding.

The unit consists of four research groups that need to intensify the collaboration, both between each other and with other units and to develop strategies to obtain more funding. The high expertise in e-learning, combined with a strong pedagogical background for many of the researchers, is one of the opportunities to ameliorate the funding situation.

UoA 7.5 Sports Technology

The Sports Technology UoA is a rather young unit, having evolved over the last 10 years as a part of the university's investment in the field of sports and outdoor equipment. The applied research is of a very good quality with high impact, and the coproduction and external cooperation are excellent, both on a national and international level. Other strong areas are multidisciplinary synergies, high external funding hit rate, excellent laboratory infrastructure, and well-established international networks. There is a high potential for further fast growth, building on the present facilities and networks.

To realise the full potential, a stronger academic leadership and more focused strategic planning is needed. In addition, some particular areas that deserve more attention are increasing the activities within the theoretical aspects of Sports Technology, focusing on higher impact journals, establishing a centre of excellence, increasing collaboration with other research groups within the university, and establishing a more ambitious PhD programme.

UoA 7.6 Engineering Physics

The Engineering Physics Unit conducts highly innovative research with excellent academic quality and strong academic impact while publishing in top academic journals. The industrial and societal impacts are also high. The unit has very good collaborations with industry, many of which as part of the FSCN research portfolio. The unit provides excellent models of how industrially relevant projects can include both applied and fundamental issues.

The staff is highly qualified and evenly distributed from research students to professors. There is, however, a need to increase the number of junior staff and to

secure their competence development and mobility.

The unit has a strong vision that is in line with the strategic vision of FSCN. This needs to be further evaluated regarding engineering physics' part of FSCN's bio-material strategy. The unit also needs to develop strategies for collaborations with other research units within the university, in order to increase the international networks and collaboration, and to encourage students and post-docs to work internationally.

UoA 8.1 Sensible Things that Communicate, STC

The vision of the research centre STC is to enable future sensor-based systems and services by conducting innovative and multidisciplinary technology research in electronics and computer science. The centre produces highly innovative research of very good quality with high productivity in excellent cooperation with a large number of industrial partners. The impact on society is very good and the many spin-off companies and a constant stream of doctoral and licentiate exams are good indications of this.

In addition, STC needs to have a more ambitious vision that also includes profiling the centre on an international arena, which incorporates national as well as international cooperation. The centre needs to develop strategies for publications that aim at increasing the impact of the research publications. Additionally, STC should develop plans for improving the lab facilities and a staff recruitment plan that includes gender balance.

UoA 8.2 Computer Science

Computer Science produces research of good quality with a very high productivity. Although the productivity is very high, the unit needs to develop a strategy for more publications in top rated journals and conference proceedings.

The unit is engaged in very high quality collaborations with national companies and organizations. The unit also has good international academic cooperation. There is, however, a need to increase collaboration and to secure more international funding.

The unit needs to clearer present the difference of the results, that is, to differentiate the fundamental research and more applied results. Additionally, the relations between STC, electronics and computer science should be clarified.

The small size of the group, in terms of time available for research, is a threat and there is a need to develop a staff recruitment plan for how to secure critical mass. The panel also recommended increased collaborations with groups within and outside the university that can add synergetic effects to the research outcomes.

UoA 8.3 Electronics

The Electronics Unit performs research of high originality, very good quality and high productivity. The unit has strong national and international academic networks and significant collaboration with non-academic organizations and industry. The impact is excellent, including very good academic impact and very large impact on society and industry through spin-off companies and coproduction with industry.

The unit consists of seven groups with partly separate agendas and focuses. However, there are a lot of interdisciplinary collaborations and the groups share the very well equipped laboratory facilities. The unit also has access to high quality laboratory facilities through the many cooperations with industry and academy.

The unit needs to clearer present the difference of the results, that is, to differentiate the fundamental research from the more applied results. Additionally, the relations between STC, electronics and computer science should be clarified. The centre should also develop a staff recruitment plan that includes gender balance.

UoA 9.1 Biology

The Biology Unit at Mid Sweden University conducts research in the field of terrestrial ecology, focusing on forest biodiversity as an ecosystem service provider and for its own intrinsic values. The group produces research of excellent quality, has high productivity, and shows an excellent publication record. The research staff enjoys a strong reputation nationally and internationally, with cooperation of high quality both in the academic world and with practical operators and institutions in society.

The UoA has a very clear scientific focus but the small size of the group is a threat. The unit therefore needs to develop a strategy for securing critical mass and for maintaining the senior staff.

The key recommendations are to develop strategies to secure long-term funding and to increase the collaboration with other units and disciplines within the university. There is a need to broaden the focus of research to include other areas, e.g. forest management, an area in which senior staff members already are engaged through public debate, or to aspects of social sciences and other relevant disciplines. Another suggestion was to utilize the very good laboratory facilities (e.g. through visitors) for increased production and funding.

UoA 9.2 Ecotechnology and Environmental Science

The Ecotechnology Unit is a small group of researchers of very diverse disciplinary backgrounds: the subject itself being cross-disciplinary, something that can be seen as both a challenge and an asset.

During the evaluation period, a professor with high research output left and a new professor was recruited. The research ambitions have been reoriented towards new objectives. The group needs to formulate a clear and focused position and research

strategy; among others a realistic strategy has to be developed for communicating the objectives and realizing them in terms of societal and scientific impact. A more focused leadership and strategic planning is needed. On the other hand, the enthusiastic environment for PhD students should be viewed as the asset it is, and be further nurtured as an inspiration for the whole unit.

The low grade of the quality parameter in the report can be interpreted as a manifestation of the difficulty of aligning the interdisciplinary ambitions of the group with the traditional subject-oriented landscape of scientific journals. This is further supported by the fact that the productivity and the quality of individual publications are found to be sufficient relative the size and resources of the group.

3.2 Publications: Productivity and Quality from Bibliometrics

3.2.1 Applied Bibliometrics

During 2007-2012, around 4 000 publications from authors affiliated with Mid Sweden University were registered in DiVA. As evident from Figure 6, about two thirds of these were published in scientific journals, equally distributed across the Faculty of Science, Technology and Media (NMT) and the Faculty of Human Sciences (HUV).

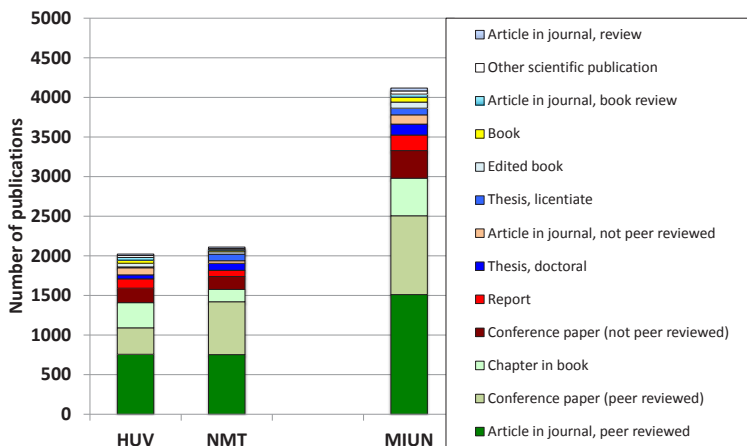


Figure 6. Number of publications per publication channel (derived from DiVA)

Whereas the NMT faculty tended to produce somewhat more publications in peer-reviewed conference proceedings, the HUV faculty produced more books and chapters in books. Divided in UoAs, units with more Full Time Equivalents (FTE) researchers produced more, especially in centres at the NMT faculty, with UoA 7.1 Fibre Science and Communication Network, FSCN (412 publications) at the top, followed by 8.1 Sensible Things that Communicate, STC (400). However, some UoAs

and centres with less FTE also demonstrated a high productivity, for example 6.1 DEMICOM/Media and Communication Studies (325 publications).

Publication (see Figure 7) has typically been carried out in peer-reviewed journals, peer-reviewed conference proceedings and in peer-reviewed book chapters, i.e. publication subjected to quality control, albeit a few UoAs mainly publish in other media without quality assessment (e.g. reports, journals and conference proceedings without peer-review).

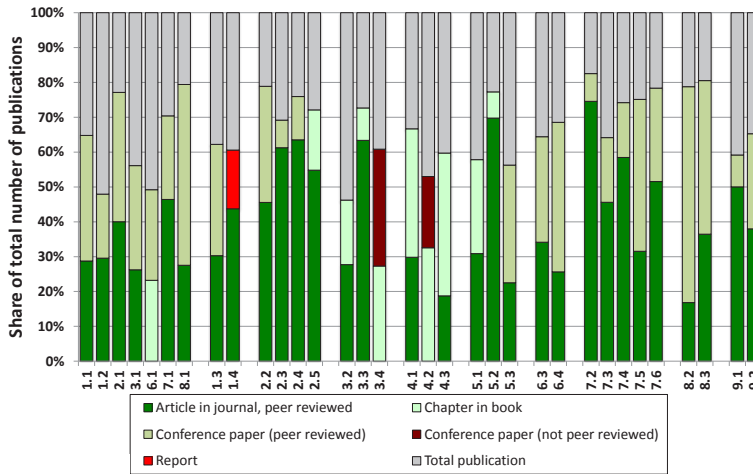


Figure 7. Share of the two most frequently used publication channels, 2007-2012

As apparent from Figure 8, most UoAs tend to publish within the Norwegian list graded levels one and two (two being the highest level of quality) types of publications.

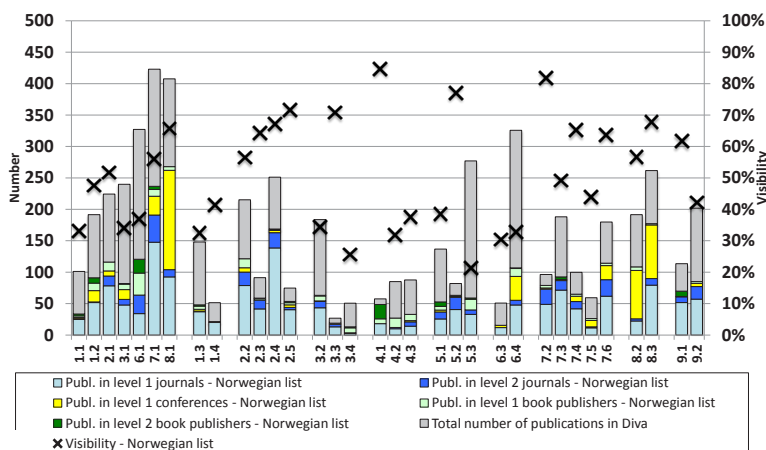


Figure 8. Number of publications and visibility in the Norwegian list, 2007-2012

16 out of 33 UoAs had more than 50% of their publications on the Norwegian list, most obvious in relation to the total output in UoA 4.1 English, 7.2 Chemistry, and 5.2 Psychology (84.7%, 81.8%, and 77.1% respectively). This implies that half of the UoAs chose to publish the majority of their research in journals, books, and at conferences classified as important in their area.

Figure 9 shows the total score on the Norwegian list, denoting the number of publications in relation to the levels of the type of publication channel.

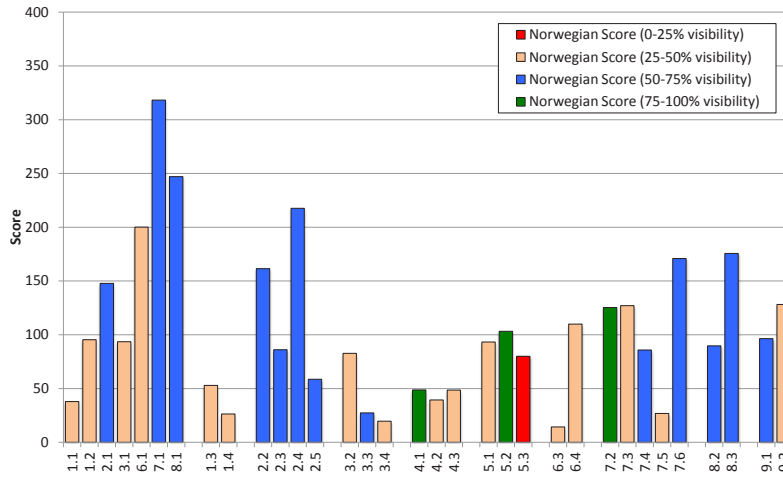


Figure 9. Norwegian score. Total score and visibility in the Norwegian list.

Thus, when productivity is considered, regardless of the publication type, the above list is somewhat changed, with UoAs 7.1 FSCN, 8.1 STC, 2.4 Nursing Sciences, and 6.1 DEMICOM obtaining the highest total scores.

When normalizing this score (i.e. counting and grading publications considered to be published in high quality channels in relation to the total output) for visibility purposes, see Figure 10, UoAs 7.2 Chemistry and 5.2 Psychology appear to have the most successful strategy. The same seems true for UoA 3.3 Criminology.

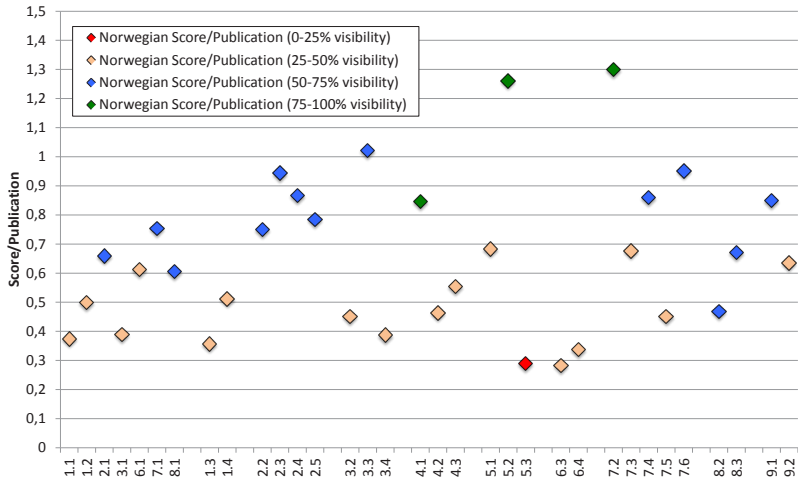


Figure 10. Norwegian Score/Publication in DiVA, 2007-2012

Figure 11 shows the proportion of the total production from Mid Sweden University found in Web of Science (WoS). WoS is considered to be an appropriate database for certain subject areas, such as medicine, chemistry and biotechnology, where it has a good publication coverage, while it leaves much to be desired in other areas, for example in the humanities and social sciences.

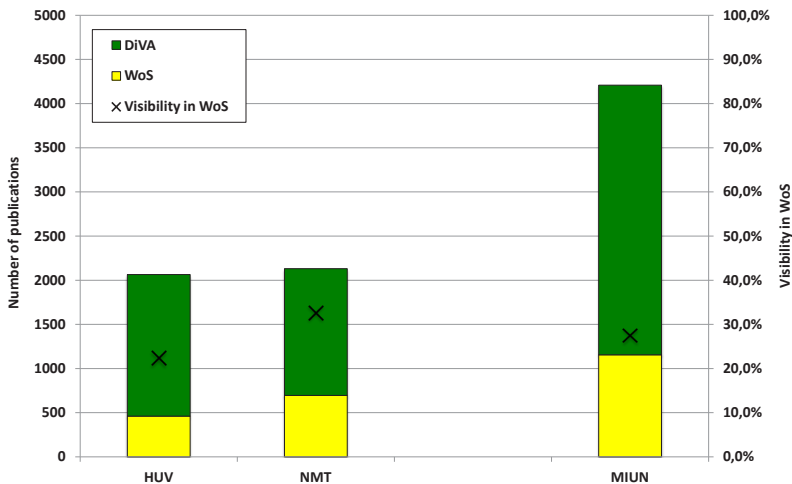


Figure 11. Number of publications and its visibility in WoS, 2007-2012

As expected, the ratio is relatively small, or 27.5%, i.e. slightly more than one out of four publications from Mid Sweden University could be found in the WoS database.

Typically (see Figure 12), the UoAs publishing in journals with high impact, and/or in high level Norwegian list publications are also represented with the highest WoS visibility. The figure depicts the coverage or the visibility in WoS for all UoAs, i.e. how many of the unit's publications are represented in WoS. For four UoAs, WoS is a representative database for their publication strategy: UoA 7.2 Chemistry with 72.3 % of the publications in DiVA also covered by WoS, UoA 5.2 Psychology with 54.4 %, UoA 9.1 Biology with 51.2 %, and UoA 2.3 Public Health, with 50.3% of the publications in DiVA also covered by WoS.

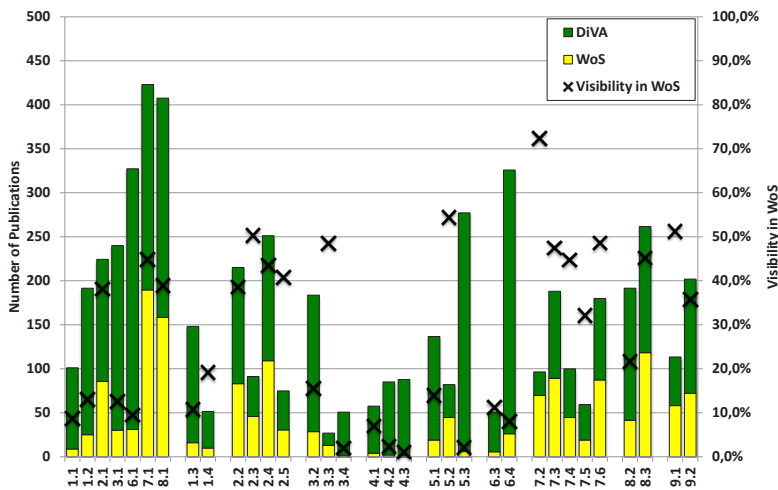


Figure 12. Number of publications and its visibility in WoS, 2007-12

Although the visibility of these UoAs can be considered high enough to constitute a representative database, the number of publications appearing in WoS is on the low side to generate secured averages and trends in citation. It is also notable that several UoAs (e.g. 7.1 FSCN, 8.1 STC, 8.3 Electronics, 2.4 Nursing Science and 2.1 SWSRC), although with proportionally lower visibility have a higher number of publications represented in the WoS.

The results from Figure 10 depicting the Norwegian score are confirmed by Figure 13 on the Average Journal Impact Factor, also showing that not only UoA 7.2 Chemistry and 5.2 Psychology, but also UoA 2.3. Public Health and UoA 9.1 Biology, appear to have a strategy of publishing through high impact channels (mean Journal Impact Factor > 2.5).

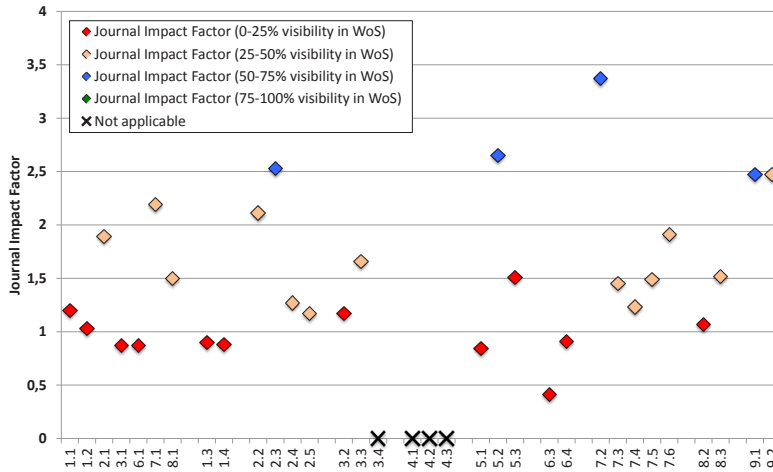


Figure 13. Average Journal Impact Factor/publication and visibility in Web of Science, 2007-12

Additional indicators in ARC13 are based on field-normalized citation data - meaning that the citation rate is compared to other publications in the same field (WoS subject classification is based on the journals publishing the article, not on the individual publication) and in the same year. The field-normalized data are acquired from Karolinska Institute's library.

For example, Figure 14 shows the total number of citations (left ordinate) and citations per publication (right ordinate) for all UoAs with indication for the type of visibility (coloured) each UoA has in the WoS, (i.e. how representative the database is for each UoA's research publications). There were eight UoAs with either enough coverage/visibility, or a total number of publications in WoS large enough to provide reliable values: UoA 9.1 Biology, citations per publication (c/p) = 10.86, UoA 3.3 Criminology (c/p = 9.33), UoA 7.2 Chemistry, c/p=7.46, UoA 2.4 Nursing Sciences, c/p=4.86, UoA 5.2 Psychology, c/p=4.79, UoA 7.1 FSCN, c/p=3.9, UoA 8.1 STC, c/p=2.45, UoA 8.3 Electronics, c/p=2.32, UoA 2.3 Public Health, c/p=1.83.

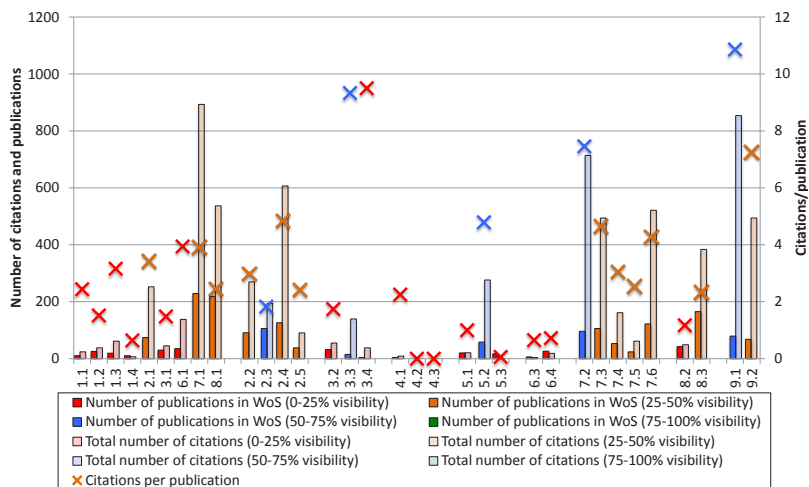


Figure 14. Total number of citations and citations/publication (average)

It is worth noting that some other UoAs, with lower WoS visibility, had a relatively high citations/publication, c/p , when using such publication types, for example UoA 3.4 Political Science ($c/p= 9.5$), UoA 9.2 Ecotechnology and Environmental Sciences ($c/p= 7.25$), UoA 7.6 Engineering Physics ($c/p= 4.2$) and UoA 6.1 DEMICOM ($c/p= 3.98$). DEMICOM was especially successful when publishing in WoS publication types – roughly 30% of their WoS publications belonged to the top 10% most cited in their field. For the UoAs with a total number of publications in WoS to yield a meaningful interpretation of field-normalised data UoA 2.4 Nursing Sciences had 15% of their WoS publication among the 10% most cited in the field, UoA 7.1 FSCN had 6 %, and UoA 7.2 Chemistry had 5% of their publications among the 10% most cited in the field.

Other calculations based on field-normalised data are the calculated Journals Field Normalized Impact (JFNI), indicating the significance of the journals in which the UoA has published. A value of e.g. 1.2 on the JFNI means that the journal in which the UoA publishes is quoted 20% more frequently compared to the average for the research field. UoA 7.2 Chemistry (JFNI = 1.25), publish in journals quoted 25% more than the average for the field), UoA 7.1 FSCN (JFNI = 1.16), 16% more than the average for the field, UoA 5.2 Psychology (JFNI = 1.11) 11 % more than the average for the field, and UoA 2.4 Nursing Sciences (JFNI = 1.04), publish in journals quoted 4% more than the average for the field.

The values for other UoAs are uncertain numeric values from a database that is not representative for the research done.

Shares of popular science publication and societal copublication also differ between different UoAs (see Figure 15) as well as the average number of countries per publication.

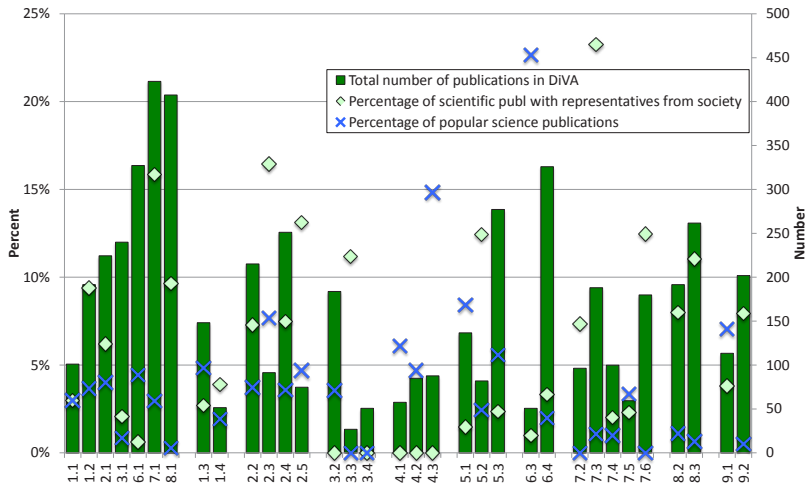


Figure 15. Popular scientific and societal copublications

UoAs 7.3 Chemical Engineering (23%), 2.3 Public Health (16%) and 7.1 FSCN (16%) have the highest ratio of coproduction with authors outside the academia, whereas UoAs 2.3 Public Health (average 3 countries/publication), 2.2 Sport Sciences (1.7), 2.1 Swedish Winter Sports Research Centre (1.6) and 5.2 Psychology (1.6) are the units with the most pronounced international coproduction. For others, academic copublication may not represent a possible option since the societal partners have other interests than research publication. With that in mind, societal copublication and international coproduction could be higher at several of the Mid Sweden University UoAs and research centres.

3.2.2 Publications: Productivity and Quality from Bibliometrics

The purpose of this compilation is to provide trends observed based on the publications from 2007 to 2012 contained in the database DiVA, with authors employed at due date, and with Mid Sweden University as registered affiliation. All publications, books, articles, chapters in books and conference presentations are counted.

A number of calculations have been performed in order to further measure productivity, visibility, and aspects of quality, based on data from one of the most well-known and used international data bases, Web of Science (WoS), and the Norwegian list. The latter is an index of publication channels used in the Norwegian national system. List and level determinations are the result of the work of committees composed of scientists from different research areas. The index divides journals and publishers into "level 0", "level 1" and "level 2", where "level 2" is reserved for the internationally most prestigious journals and publishers within the discipline. "Level 2" status is granted by national expert committees for each

discipline, and may only be given to 20% at most of all publication channels in a given discipline. "Level 0" could be designated to journals with poor quality control but also to journals not yet graded. Currently, 22 367 academic journals and series are listed, 3 015 are designated as Level 2, i.e. journals and series considered to be the most highly regarded within each discipline. There are 1 393 recognized academic publishers, and 88 academic publishing companies are designated as Level 2. The index has been used in Sweden as a complement to the analysis of the WoS, since it provides an opportunity to develop a comparable indicator where research fields, whose publications have low coverage in WoS, can be included. WoS on the other hand, together with SCOPUS, are the databases commonly used by organizations working to develop rankings of universities, and where bibliometrics are included as part of the assessment. Examples of such rankings are:

- Times Higher Education World University (THE)
- Shanghai Jiao Tong (ARWU)
- Higher Education Evaluation & Accreditation Council of Taiwan (HEEACT)
- QS World University Ranking
- The Leiden Ranking (CWTS)

Visibility in WoS is therefore worthy of some interest.

It is also worth noting that in Sweden, national resource allocation for research is based on WoS data.

Research traditions and research culture differ between UoAs. Obviously, WoS is not the most prioritized/appropriate database for several UoAs at Mid Sweden University. Nevertheless, comparisons between UoAs with different publication traditions are seldom fruitful. Some UoAs might benefit strategically from being more visible in the WoS, whereas the WoS publication coverage for UoAs representing the humanities and the social sciences are yet poor. Although the Norwegian list gives an opportunity to develop a comparable indicator, where research fields whose publications have a low coverage in WoS can be included, straightforward analyses and comparisons are hampered by different FTE, and also by the individual UoA's choice of publication type. From a general institutional point of view, it would be of value if most UoAs could develop strategies including a heightened rate of publishing in level 2 publication types. Having said that, it is important to stress that some UoAs that include publications in DiVA, other than publications appurtenant the Norwegian list (e.g. peer-reviewed articles in journals not listed in the Norwegian system, reports, articles in popular science publications, non-peer-reviewed conference proceedings, etc.), are at disadvantage, since figures reporting visibility often constitutes the ratio of the unit's total number of publications and the number of publication in the Norwegian list or in the WoS. A questionable implication of this is to cut down on these types of publications in order to get a higher share of level 1 or 2 publications (or to use other types of indexes for measuring research

productivity and quality). Nevertheless, using bibliometric data in concert with the expert panel's evaluation can give hints on how different UoAs can further develop. Several UoAs appear to have an explicit research strategy. A good example is UoA 2.3 Public Health that appears to have a well developed and deliberate strategy for its publishing and cooperation. Even if the total production is too small to generate the required number of publications for a satisfactory bibliometrics result, UoA 2.3 Public Health appears to have a strategy that involves:

- publishing in primary journals with peer-review
- a small part of the publication is done by less controlled channels (approximately 15%)
- publishing in channels that provide good visibility in the Norwegian list (approximately 65% visibility)
- obtaining a Norwegian Score/ publication that is among the top 5 at Mid Sweden University
- well developed academic cooperation (number of authors per publication is on average 7.5)
- well developed international cooperation (number of countries per publication is 3 on average)
- having an established cooperation and copublication with non-academic organizations (about 15 % of the publications)
- aspiring at publishing in popular science magazines to a lesser extent (about 7.5 % is currently popular science publications)
- publishing in channels that provide good visibility in WoS (over 50 %)
- publishing in journals that provide a high Journal Impact Factor (over 2.5)
- obtaining a high visibility in KI WoS (just below 50 %).

3.3 Financing

The possibilities to get external funding for research differ greatly between the UoAs. This also appears to be true for the success of getting grants. Perhaps not surprising, the research centres at Mid Sweden University, and UoAs at the NMT faculty, are generally the UoAs with the most successful funding policies (see Figure 16).

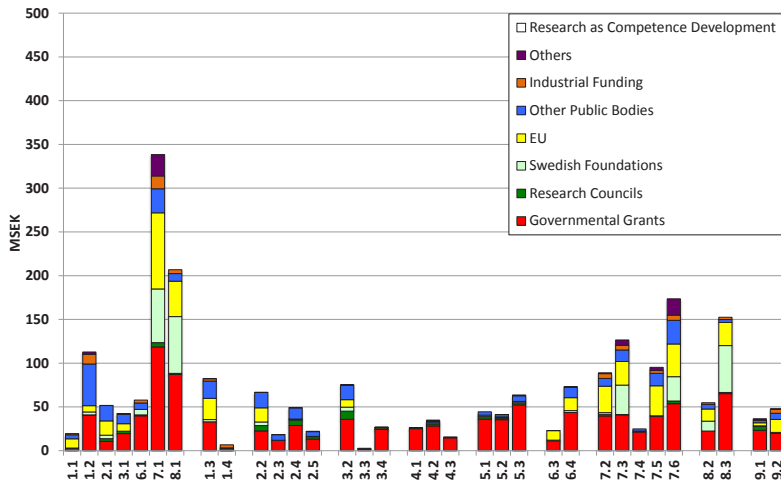


Figure 16. Total Research Funding 2007-2012

It is obvious that governmental grants are the most important source for research funding at Mid Sweden University, although grants from the EU, as well as from Swedish foundations and other public bodies, also contribute. For about half of all the UoAs, the governmental grant makes up for more than 50% of the total research budget, and for some UoAs, it mounts up to around 80%, or more (see Figure 17).

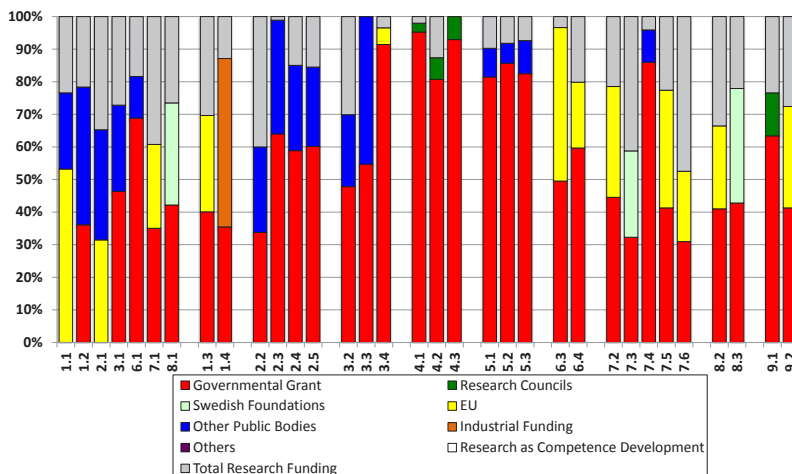


Figure 17. Share of the Two Largest Turnover Sources, 2007-2012

However, there are some remarkable exceptions, for example UoA 1.1 Centre for Economic Relations and 2.1 Swedish Winter Sport Centre, who have external grants way surpassing governmental funding. Several other UoA has around, or less, than 40% of their funding from the governmental grant.

Financing from the Research Councils is associated with a very high scientific quality and only 10 to 20% of applications get contributions. This ratio is perhaps mirrored in Figure 18, although some UoAs (i.e. UoA 3.2 Sociology and Gender Studies) have been more than successful. UoA 2.2 Sport Science and UoA 2.4 Nursing Science, as well as UoAs 7.1 FSCN and 9.1 Biology, are also reliable receivers of contribution from Research Councils.

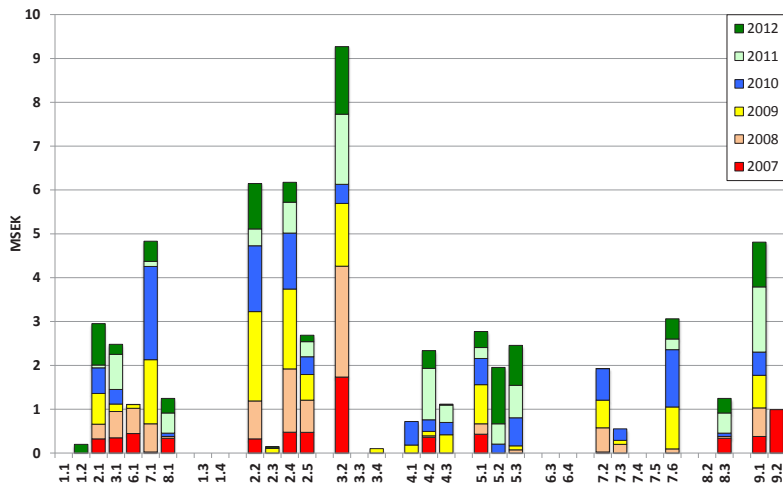


Figure 18. Turnover from Research Councils, 2007-2012

3.4 Impact Cases

Although Mid Sweden University is a very young university, established in 2005, the research performed shows impact on the society outside academia. In ARC13, the UoAs were asked to give examples of and to describe the nature of impact that the research activities has contributed with. Table 4 presents the titles, in alphabetic order, of the Impact Cases presented. In order to illustrate some of the economical and societal impact Mid Sweden University has upon society outside academia, some examples are given below.

3.4.1 Wealth Creation, Economic Prosperity, and Regeneration

Self-administrated questionnaires for measuring soft values such as quality management values, Lean values and co-worker health were generated as a result

of research at Mid Sweden University. This tool can help organizations to detect shortcomings within management that are important for co-workers' well-being, satisfaction and motivation. It can also be used for measuring the practice and importance of quality management and Lean values. At the starting point, it can help the management to prioritize which areas to focus on while as a recurrent measure it can be a complement to hard measures like cost and lead-time reduction. Using the tool, one can also measure the practice end importance of a number of Lean values. The tool has been used by organizations like Engcon Nordic AB, Nord-Lock AB, The National Dental Health Service Gävleborg Ltd, eight schools in the county of Jämtland in Sweden, etc.

3.4.2 Changing Practices

Since the advent of the Internet, the major part of tourism transactions is handled electronically. Customers leave electronic traces during all travel-related activities, like searching and trip planning, reservation and booking, service consumption and post-trip activities, like feedback provision in community web sites or online surveys. Consequently, a huge volume of data on customer needs, transactions, behaviour and perception is stored in various knowledge sources at tourism destinations. In collaboration with Destination ÅRE AB, SkiStar Åre, Tott Hotel Åre, Copperhill Mountain Lodge and Holiday Club Åre, all core stakeholders of the tourism destination Åre, the development started that resulted in an all-stakeholder encompassing Business Intelligence-based Destination Management Information System (DIMS-Åre). As the main scientific contribution, the application of methods of Business Intelligence has been fully validated at the level of a tourism destination. Today Åre is in command of a unique infrastructure which creates and disseminates up-to-date knowledge about tourists' travel motives, service expectations, needs and channel use, quality of service experience, value-added and booking trends per guest segment, etc.

3.4.3 Collaboration with Large Companies

An industrial research college in mechanical pulping was set up at Mid Sweden University together with the companies SCA, Stora Enso, Holmen, Norske Skog, Metso, Eka, and Eurocon Analyser. In total, 17 research projects were started within the areas Electrical Energy Efficient Manufacturing, Control of Pulp and Product Quality, and High Brightness and Brightness Stable Products. A number of industrial PhD students from the companies were engaged in the project forming the industrial research college. Among the results obtained were the process Advanced Thermo Mechanical Pulp that was patented by Andritz in cooperation with Norske Skog. The process is expected to reduce the power consumption by 30-40% in comparison with conventional methods. The process has been installed in the UPM Steyrermühl Mill in Austria.

3.4.4 Improving Social Cohesion

The contemporary Europe – as represented by the European Union - envisions itself as an open, tolerant, multicultural, democratic community at the same time as this vision is contradicted by everyday events, such as persistent stereotyping, stigmatization, discrimination at all levels of society, relatively successful political parties espousing racist ideologies, increasing verbal and physical abuse of immigrants and minorities across Europe. Coordinated by Mid Sweden University and with participants in Germany, United Kingdom, Italy, France, Austria, Poland, and Cyprus, a comparative research project was set up with the objective to better understand the questions of exclusion and integration. The outcome was presented to the European Commission and influenced politicians and EU lawyers. Nationally, project participants have been invited as experts in discussions on racism and discrimination. The Swedish government initiated a governmental inquiry on structural discrimination headed by a researcher from Mid Sweden University. The inquiry put forward several suggestions for combating structural racism and discrimination in Sweden and some of them have influenced policy makings in the area of racial discrimination and Swedish integration policy. The coordinator has been interviewed by e.g. the BBC, Washington Post, French TV and French international radio, Swedish radio and TV. Project participants have been invited to uncountable national and international public seminars and conferences on the topic besides debates and articles in major daily journals.

3.4.5 Start-ups

Caseman Rehabilitating AB is a spin-off company from Mid Sweden University that provides recovery training according to Strength Model Case Management. The origin is the development of basic and advanced level courses at the university taken into research at postgraduate level in rehabilitation science, resulting in a case management scheme with a recovery-oriented approach. The model takes a basic humanistic view and focuses on enabling and facilitating life. Enabling refer to the clients' inherent strengths, talents and abilities to function independently. Facilitating implies to create channels to access the resources that the client requires and guides the client towards taking the right action at the right time. Caseman Rehabilitating AB shows a positive economical development with a turnover of almost 2,5 MSEK for its second fiscal year.

Research at Mid Sweden University on a sensor readout method for printed sensors embedded into the antenna of standard UHF RFID tags resulted in the spin-off company Sensible Solutions Sweden AB. The idea is protected by a patent hold by the company. The usability has been demonstrated for measuring displacements, temperature thresholds; achieving printed humidity sensors and creating a gas sensor functionality. Evaluation and further development of the product has been performed in cooperation with customers like Skanska, NCC, STO Scandinavia,

Runevad VVS, Schweizerische Mobiliar AB, System Industrie Electronic (Austria) etc. The final product line was released in 2013, implying that the full business potential cannot be seen yet.

3.4.6 Changing Faces of Societal Values

Religion has still a great impact on the values of today's society. In 1978, the remaining parts of the document Ancient Gospel of Judas Iscariot was found, hitherto only known through meagre reports in the polemical writings of the church fathers. After many dramatic events, the document was rescued for research in 2004. Researchers at Mid Sweden University took part in the discussions and started their own research on the document. It was found that far from being the villain who betrayed Jesus, Judas Iscariot was the only disciple who understood Jesus and who helped him in his intention to be crucified. Besides academic interest, the results had a broader impact. One result was two 30-minutes programmes on SVT, the Swedish public service television company, on the Gospel of Judas. Another result was that Teaterstudio Lederman in Stockholm also contacted Mid Sweden University. One outcome of these discussions was the play Judas Testamente that has been performed in Sweden and abroad. Besides the researchers have been invited to and participated in a number of public lectures.

3.4.7 Evidence Based Policy-making

Forestry is of prime importance for many regions throughout the world. One of the most severe forest pest species is the spruce bark beetle. During epidemic outbreaks, it can cause stand level mortality leading to the loss of both saw timber and pulp wood. Such an outbreak was confirmed in autumn 2010. To mediate the damages, a cooperation headed by the Swedish Forest Agency was started with participants from SCA Skog, Gällö Skog, Sveaskog, Callans Trä, Norrskog, Skogssällskapet, and Mid Sweden University. Among the outputs from the collaboration is the change of guidelines to forest owners. The new guidelines emphasize the need to remove basically all dead spruce trees and to avoid leaving individual spruce trees as retention trees. This is contrary to the environmental guidelines, both the Swedish Forest Agency recommendations and as expressed in the forest certification criteria, FSC and PEFC. A follow-up project analysing the effects is ongoing where the main question is if the changed guidelines are followed and if so, if the environmental concern has been redirected to other tree species.

3.4.8 Public Engagement in Risk and Safety

Based on risk society theory, research at Mid Sweden University shows that heterogeneity is an important aspect for the understanding of how risk, safety and accidents are perceived, valued and assessed by different groups of the Swedish population. People differ regarding risk communication preferences, and they

represent a variation of risk and safety behaviours. In collaboration with the Swedish Civil Contingencies Agency and the Swedish NGO Public and Science, the concept has been further developed by mixing scientific studies with interactive communication of research. More than 700 pupils contributed to the data collection by taking photos of risks in their everyday life and attaching a short description. This material has been scientifically analyzed as well as applied by the Swedish Civil Contingencies Agency for illustrative risk communication on the Internet.

Title of Impact Cases
3D Video
ABUEL. Elder Abuse: A Multinational Prevalence Survey.
Archives and Information Science
The Bank Area
The Business Intelligence-Based Destination Management Information System Åre (DMIS-Åre)
The Case of Obesity
The Changing Faces of Judas Iscariot
ChemseQ
from a Gender Perspective
Clinical Psychology
Collaboration with Mid-Norway
Collaboration with the Surrounding Community: the County Council of Västernorrland
Colleges and Two Museums
Communicative Leadership – Analysis and Development of Core Competence
Cultural Analysis in School Development – Management of School Praxis and School Development
Demand Driven Development and Information Systems
Division of Labour in Couples, Work-Family Balance and Wellbeing
An Electronic Text Edition of Depositions 1560–1760 (ETED)
Energy Aware Reliable Wireless Sensor Network
Energy Efficient Mechanical Pulping by Modified Wood Chipping Process
Experiences From in-situ Remediation Trials in Remote Areas of Northern Sweden
The European Dilemma: Institutional Patterns and Politics
The Graningeverken Archives Project
Growth in Women Entrepreneurship
The Image of the Financial Crisis: Public Trust and Public Expectations
In-situ TEM Probing
Industrial Research College Mechanical Pulping
Influencing Societal Debates in Sweden and Colombia
International Collaboration
Measuring Soft Values
The Multifunctional Roller Ski
Musculoskeletal Simulations in Sports
OrganoClickAB
Outdoor Recreation in Change
Paper Four and Live Paper
Paper Optics
Physiological Responses to Fluktuations in Exercise Intensity
Printed Wireless Sensor Labels
The Project “Public E-services in Cooperation for Open Innovation”
Quality in Commercial Experiences, New Perspectives and Tools
Research Station Nicaragua
Revision of the Environmental Objective “Sustainable Forests”
The Revision of the HCR-20, the Most Commonly Used Violence Risk Assessment Instrument in the World
Richard Wagner: An Interdisciplinary Field of Research
Risk and Safety in a Heterogeneous Society (ROHS)
Risk Assessment for Domestic Violence
Role of Glycogen Availability and Muscle Localization on Skeletal Muscle Function in Elite Skiers Heading
Simulacra and Substance in John Banville’s Work
Societal Entrepreneurship in Sparsely Populated Areas - SESPA
The Spruce Bark Beetle project
Strengths Model Case Management and Personligt Ombud (PO) in a Recovery-Oriented Context
Transformation of Social Relations and the Need for Support
X-ray Imaging

Table 4: Impact Cases



4. Panel Reports

4.1 International Generalist Expert Panel Report

Introduction

The panel

The International Generalist Evaluation Panel (IGEP) consists of three experts:

- Christina Johannesson, senior consultant with Kontigo AB from Stockholm, Sweden,
- Rolf Ericsson, consultant of business and technology development from Gothenburg,
- Harry Fekkers, counsellor for Research and Innovation from Maastricht University, the Netherlands (chairman).

The members of the IGEP have read the self-assessment documents of all the research centres, for each centre they had a meeting with the corresponding International Scientific Evaluation Panel (ISEP) and they also had a meeting with a representation of the research centres and the ISEP together. In many cases, representatives of students and cooperating organizations from outside the university also attended these meetings. At the end of the week, we were offered a separate meeting with the Vice-Chancellor, giving us a clearer picture of the university's vision and strategies and had the possibility to discuss some of our concerns in relation to that. The IGEP did not have the opportunity to pay visits to individual researchers or facilities but has had to rely on the written and orally presented material. The IGEP has encountered a very open atmosphere in the meetings and expresses its gratitude for the information made available before, during and after the meetings.

Process

The IGEP studied the self-assessment reports carefully. We also used Internet to get a complementary picture of how the university and the centres present themselves to external stakeholders. The parts related to the scientific quality of the research and the academic performances are left to the judgement by the ISEPs. The grading of the research centres by the ISEP is of course relevant input for the IGEP, but in most cases the grading was not available until after the site visits.

Context

According to the MIUN research strategy 2012-2016, the main criteria to form a research profile in MIUN are:

- Scientific excellence formed by well-established and internationally competitive research within the profile area
- Common vision and overarching goals

- Significant interaction with strong players in the surrounding society and in international research networks

At the moment, MIUN has profiled research in nine (9) areas. The research strategy states that four (4) of them are especially strong when it comes to scientific excellence and interaction with external players. The four strong profiles are:

1. Forest as a resource,
2. Industrial IT and digital services,
3. Health, Sports science and Sports technology,
4. Tourism and adventure.

The set of research profiles is not static and may change depending on competence and relevance. During the period 2012-2016, a revision of profiles will take place. Monitoring and evaluation of the research include indicators in four areas: External funding, Publication/citation, Graduates and Co-production.

Each of the four especially strong research profiles has a research centre:

- Fibre Science and Communication Network (FSCN)
- Sensible Things that Communicate (STC)
- Swedish Winter Sports Research Center (SWSRC)
- European Tourism Research Institute (ETOUR)

There are also three (3) research centres among the other five (5) profiled research areas:

- Centre for Study of Democracy and Communication (DEMICOM)
- Risk and Crisis Research Centre (RCR)
- Centre for Research on Economic Relations (CER)

They are centres for high quality research in the profile areas. They serve as “umbrellas” to organize and brand the research within each profile and also as platforms for collaboration with financiers and other interested parties.

A MIUN decision dated 14 August 2012 stipulates the criteria for a research centre at MIUN. According to that, a centre should represent excellent research within the research profile area and should typically have a turnover of at least 10 MSEK per year in research funding. A lesser turnover could be accepted if the research is under fast development and with great potential to soon become a strategically important area for the university. A centre is located in the department where the biggest share of personnel active in the research is employed. Personnel from the relevant departments man the centre, i.e. it does not have its own research staff. Each centre has its own budget and business aggregated in the activity of the department.

Scope of assessment

The seven (7) research centres listed above are among the UoAs. Beside expert evaluation of the centres’ scientific quality and societal relevance, they are assessed by an international generalist evaluation panel (IGEP) on how they act as a MIUN centre. The overall objective of the IGEP is to contribute to the overall strategy of

MIUN in the next 5-10 years by assessing the contribution of the 7 research centres to the SWOT of the institution as a whole.

In the generalist evaluation, we assume that the MIUN development plan, research strategy, and the application for strong research environment funding from KK-stiftelsen (The Knowledge Foundation) are documents that reflect the university's ideas about a profile (vision, goals, strategies etc.) for the university as a whole. Hence, we also assume that the documents are examples of steering documents for the centres, as parts of the university. At the same time it should be noted that, in spite of the role of the IGEP, we were not provided with the steering documents beforehand, but found them on our own initiative on the university's website. The development plan available on the web site covers the period 2009-2012. The research strategy, covering the period 2012-2016, is not on the website, however provided us by the Vice-Chancellor at the end of the site visit, together with a document regarding criteria for research centres at MIUN. There does not seem to be any SWOT concerning the university as a whole. Furthermore, the institutional policy documents are available only in Swedish, which is valid also for most of the information about the research on the MIUN website.

In the assessment we have concentrated on the research and comment on the education only as a necessary part of being a complete environment, according to the university's strategy, making the centre and the university attractive to students, forming a base for recruitment to PhD studies as well as for employers/co-production partners.

We will comment on each centre's capacity to manage its own activity according to its vision and strategy, as well as how it relates and contributes to MIUN's overarching strategy and research centre criteria. For the first aim, we will report on the centre's management engagement, which also reflects what MIUN expects from the centre, i.e. vision and goals, identification of hindrances and opportunities (SWOT), strategy, action plans and monitoring of results. For the second aim, we assume a frame of reference based on keywords in the documents that we perceive as strategic for MIUN and the centres (see above). We have used the following to interview the representatives of the research centres and the members of the expert panels:

- Profiling (branding, positioning)
- Interdisciplinary
- External fundraising
- Cooperation (international, national, regional)
- Active innovation/commercialization
- Complete (research, education)

About SWOTs

The IGEP used a kind of SWOT approach to analyze and report on strategic aspects of the evaluated research centres. How SWOTs are constructed and used is somewhat

different than done by some of the research centres. In the approach by the IGEP, a SWOT is a framework of two dimensions: one being internally or externally, the other being positive or negative. The dimensions with each two alternatives result in the following framework:

	Positive	Negative
Internal	STRENGTHS	WEAKNESSES
External	OPPORTUNITIES	THREATS

The argument behind this framework is that the internal factors can be addressed with policies of choice as they refer to the area of influence of the organization. And therefore, these factors are the prime elements for strategy and management. The external factors are not directly influenced by the organization on the short term, but may be influenced indirectly or on a longer time horizon. Reputation, branding, lobby and so on address these factors and are part of the communication strategy if possible.

Preliminary remarks

The university and the research centres have done a good job in preparing the self-assessment reports. From experience, the IGEP knows how much effort it takes to collect all the information and present the results of research that already has lost the attention because of the time spent on other issues. It was very helpful that in all the assessments, the same format and the identical type of tables were available.

Nevertheless, the IGEP had difficulties in interpreting the figures, as only the figures of research were included in the tables and not the figures that constitute the context for the research environment, such as statistics on education, allocation of the budgets in the university, profit and loss statements, value of work in progress, budget spending and the like. In some cases, there seems to be differences in interpretation of what the Total Research Funding (Table B.1.2.2) comprises. In the tables about publications and citations, statistics are used that are not the international standard.

The IGEP was not beforehand provided with a comprehensive university research policy, nor a university SWOT or criteria for being a Research Center. The brief information IGEP found on the website and the communication about the coming research strategy were not sufficient for the evaluation purposes. So, for the IGEP, it is unclear what the expectations of university management are in terms of assessing the performance of the research centres and the centres' contribution to the institution as a whole. It is clear that the seven research centres play a crucial role in the research profile of the university, and will do so in the next period. But we lack indications about quantities, budgets available, monitoring progress, sticks and carrots to be

applied, constraints that have to be met and other conditions needed for planning the implementation of a strategic goal.

When it comes to assessing the quality and impact of a university in the national system of higher education in Sweden, the IGEP thinks that the national U-Rank is a relevant indicator for the universities. In the assessment of the research centres, there is no reference to this ranking as it assesses the university as a whole. Nevertheless, if MIUN wants to improve its position in U-Rank, it has to look at the constituting factors that contribute to the overall score and it needs to address the issue with precise strategic policies.

General observations

- In many research centres, there is the need to have more PhD students enrolled and engaged in research. The university regulations limit these numbers by financial-administrative restrictions. It is understood that there must be limits to the liabilities the university can bear for the salaries of PhD students.
- Also, the KK environment has limitations when it comes to public-private partnerships with regard to commissioned research and applied research.
- The need to increase research capacity, especially from permanent and long-term contracted staff is apparent if MIUN wants to stay competitive compared to other universities in Sweden.
- The support for research in MIUN on the central level that is beneficial to the research centres is limited. The visibility of the communication support and the holding is low. There is no grants support. These functions become a necessity in an environment where finding of funding for research is decisive for the research capacity.
- The university overhead that is charged on external funding is perceived to be imbalanced compared to the direct funding by faculty funds to the research centres. The acceptance of these charges is low.
- The conditions, incentives and desired direction of the university research policy are not clearly understood by the research centres.
- The number of alumni of the university and of the research centres is growing steadily. The alumni relations seem to be underdeveloped. As alumni are the best ambassadors for the university and constitute a future source of collaboration and funding, a more pro-active approach is needed.
- In all research centres, there is demand for more government (faculty-) funding for expansion without any insight in the financial potential of the university. As nobody wants to relocate funds from one centre to the other, the result is the request for more money, which might not be there. This asks for a shared understanding of the financial situation of the university on the mid-term.

The Research Centres

ETOUR – European Tourism Research Institute

Description

ETOUR is the research centre for Tourism. It was established as a regional active agency by the national tourist authority in 1997 and was funded by the European Regional Development Fund. Since it integrated with the university, more and more, the focus came to be on applied research and academic performance. ETOUR is a major constituting part of the Department of Tourism Studies and Geography.

Observations

The representatives of ETOUR demonstrate great commitment and enthusiasm for their research and for the setting in ETOUR. The ambition to become a first class research centre internationally is strong. The centre claims to be no 1 in Sweden and among the top 5 in the Nordic countries. Research centres like ETOUR struggle with the problem of being applied and thus interdisciplinary research organizations that always have to prove their academic relevance against all odds.

Strategic outlook

The field of tourism is large, growing and of high relevance for the region, the country and internationally. The need for evidence-based policies, approaches and business models are apparent. Most of the disciplines involved in the study of this area of economic activity are present in MIUN. Thus, it makes sense that ETOUR is one of the profiling institutes in MIUN. There are sufficient and challenging strategic opportunities for this research.

The strength of ETOUR is mainly with the present staff that is highly committed and productive. The international presence and network comply with the status of a well-recognised research group. The cooperation with the economic drivers in the field is fine and the fund raising is impressive.

It seems ETOUR is well prepared to cope with the threats of competition. In the coming years there is no fear for diminishing political or economic attention for this field, although it is clear that there will be ups and downs in this kind of support.

For three important areas, the self-grading of ETOUR resulted on a scale 1-8:

- recruiting qualified staff and PhD students: 5
- attracting external research funding: 6
- the international positioning of the UoA: 7

The biggest strategic issue is the *weaknesses* of ETOUR.

1. The first is the reliance on a small number of productive scientists. It will not be easy to maintain productivity if one of them leaves or shifts attention. There seems to be no contingency plan for such an event.

2. The second is the lack of clear visions and strategies to maintain and to develop the position. Maybe it is not sought for but the centre has been there for very long and has a great Swedish and Nordic position. But what about the future? The answers are vague and the work is dispersed and in spite of the aim for putting tourism on the list of important industries, the strategy is lacking. In spite of having big employers on the advisory board, a wide list of collaborators, a fast growing sector, and two external partners certifying the benefit from collaborating with ETOUR, the talk is focussed on the problems with limited resources and that the majority of companies are small and not so in to research and funding. The number of alumni is rather high, because of the long record of the centre, but they keep no track of them, to get support or to use as channels for establishing collaboration and funding.

3. The third is the embedding of ETOUR in the university. The impression is that to a limited extent, or even not at all, use is made of the expertise in other departments in the university, or vice versa. Being an interdisciplinary field of study, one would expect that in many cases, multidisciplinary teams would be brought together to work on projects. The members of ETOUR have a role in education – almost every person has its main activities in education – but the involvement of students in the research seems to be limited. The number of PhD students is rather low (although increasing in the recent past) and as a consequence, the number of qualified scholars that can be added to the brainpower of the tourism industry in the region or in Sweden is limited, as is the contribution to the academic community in the field.

4. The fourth is the internal planning and control cycle in ETOUR in connection with that in the university. The 6 goals set by ETOUR are pronounced loud and clear, but there is no baseline from where to monitor the achievements made and consequently what action to take. It is understood that the present business model of acquiring projects of applied research and research with the need for matching no longer can contribute to the growth of ETOUR. Alternative business models and ways to fund research and the researchers are needed, but no attention is given to this existential question, whether inside ETOUR or in the wider context of the university.

5. The fifth is the range of subject covered by ETOUR. There are three core research areas (Nature-based tourism, Destinations and Spatial Dynamics) but each has 3 so-called, but not so interrelated, “main perspectives” of which one (Destinations) is as well a perspective as a core research area. In addition to that, ETOUR handles another 4 additional research lines. So, the impression is that the arch of interest is rather wide and that more energy has to be applied to bringing these issues (and the corresponding teams) in a well-ordered, recognisable and therefore presentable, research programming. Such programming should also serve as a

selecting mechanism of which type of projects to accept and which to reject. Now the impression is that all projects are accepted and that the programming is the result of successful (in terms of funded) acquisitions. Available resources may influence the academic agenda, but they cannot be the dominant factor.

Recommendations for the research centre

We think ETOUR has more opportunities than strengths or threats. The main recommendation is to work on the weaknesses of the present institute.

1. What is needed is making explicit the goals and the strategy in SMART terms and putting in place management tools that are able to monitor progress and clarify academic goals with the research programming. The work should include a more energetic vision and sharp strategies to overcome the financial uncertainty, which should be expected from a centre like ETOUR, with a long record, a gained position and a fast developing industry and business environment.
2. More interconnection with education and the other departments in the university will help to widen the disciplinary base for research and to boost the brainpower put into the academic and economic arena of tourism. Innovation in this sector is needed and the contribution to that by ETOUR has to increase. Suggested business models to consider are creating spin off companies, student companies and evidence-based services.
3. To increase the academic visibility, co-creation of articles and research in well established disciplines (and their journals, i.e. economy) could be an implied strategy.

DEMICOM – Center for Study of Democracy and Communication

Description

DEMICOM is the research centre for democracy and communication in politics and the business community. It is the oldest research centre of the university and was founded outside the university. It became integrated in 2006 and constitutes a research branch in the Faculty of Science, Technology and Media. The number of staff active in research is reasonable, but in FTE the base is rather small (2,3 permanent staff, 5,8 temporary research staff). The number of researchers involved is higher as researchers from various departments contribute.

Observations

The IGEP had a joint meeting with DEMICOM and the expert reviewers in the office of DEMICOM. The IGEP was impressed by the large production of books and articles that were spread out on the table. The researchers demonstrated a great commitment to the research in the research centre. The level of international collaboration is high.

The national and international networks, in which the researchers are involved, bring with it that they travel a lot and present their knowledge in many places in Sweden and abroad. The more remarkable is their high productivity.

The research centre has a strong ambition to become a leading research centre within Sweden by 2018. In terms of reputation, this goal looks realistic. But it is recognised that in terms of scale and impact, this will be a hard, if not impossible, way to go. The research centre has made a strategic plan where the main concerns of the present management are described, but with little operational activity plans to cope with the situation.

The representatives were, to a limited extent, involved in the preparation of the self-assessment. Only in a late stage they were informed about the process of evaluation. The figures in various tables were not according to the own perception of the research centre.

Strategic outlook

It is clear that there is huge demand for the type of research carried out by DEMICOM. In politics, in media and in organizations, the impact of communication on trust, acceptance of decisions and leadership is crucial. At the same time it has to be recognised that the funding power of the organizations involved is not very high, as is the willingness to contribute to basic research. So, the opportunities are there, but ask for continuous and careful maintenance of network relations. The networks are strong and extended. In the regional environment of the university, the number of media companies is limited.

In three important areas, the self-grading of DEMICOM resulted on a scale 1-8:

- recruiting qualified staff and PhD students: 3
- attracting external research funding: 4
- the international positioning of the UoA: 7

The threads in the field where DEMICOM is active are caused by the competition of other Swedish research organizations and by the economic difficulty or decline of the sector of media. A firm reputation and branding has to prevent this situation to influence the research centre in a negative way.

The strengths of DEMICOM are with the networks, the commitment of the research staff and the productivity. The close links with media and officials in politics, regional development and more contribute to the visibility and recognition of the research centre. Frequent public performances add to that.

The environment of the other departments and research centres within MIUN where DEMICOM has easy access should be strength as it opens the possibility to broaden the academic backbone for DEMICOM research.

The weaknesses are related to the unbalanced organization and embedding in MIUN. The university appears to give limited attention to the centre. DEMICOM is well recognized externally but not internally and externally not as part of MIUN.

Belonging to the Faculty of Science, Technology and Media may be positive since the faculty is the stronger one, but it may affect the recognition of the research negatively. There is vulnerability in the staff. The connection to educational programs, especially graduate education, is weak. The research centre is not able to develop its own future champions. The limited possibilities (what is perceived as possibilities) to attract PhD students and staff due to internal restrictions at MIUN, and the competition from universities with better infrastructure and location, are real weak points. The collaboration with other departments and research centres at MIUN is developing, and new initiatives in that direction look promising.

Recommendations to the research centre

1. Primary attention has to be given to broadening the academic base of the RC by increasing the number of permanent staff, educating the next generations of researchers and connecting with other academic disciplines and resources within MIUN. If the university should be able to invest in the centre, there should be more of an agenda for what and how when it comes to cross-fertilization.
2. The research centre has to look for new business models to ensure a continuous stream of income to sustain the needed research capacity and to create resources for PhD projects. It is of little help to wait for an increase in faculty funding. New arrangements with industry, governmental bodies and regional players might be necessary. There will be a need for a continued and more in-depth discussion about the values the centre creates, and how these can be monetized in the certain context of political science, where partners often are public authorities and governments.
3. The third recommendation is more addressing the university. It seems that the centre is named a profile more as a result from being there for a long time and being productive and well recognized externally, but with the never left epithet "promising". It would be of great importance that the university clarifies what it is to be "promising" and if there is a next step and what it takes, avoiding to decrease, or lose, the centre's energy, productivity, staff and student attractiveness. The main issue is if the centre ever will be subject to more faculty funding, to be able to attract, and co-finance, external funding.

STC – Sensible Things that Communicate

Description

STC stands for a rather creative name because the research centre is electronics and

computer science focussing on digital communication with added intelligence by equipment. The research centre is one of the four strong profile centres of MIUN and has a well-developed facility for experimentation. There are strong links to industries in the region and many innovations there are made possible by STC. There is a good connection to education, resulting in a continuous stream of students in Master and PhD programs (although the numbers are still limited).

Observations

The IGEP had a meeting with the expert panel before the joint meeting with representatives of STC. The experts shared their first impressions of their assessment of the research at STC. On most criteria the grading will be good, in some cases tending to excellent, but certainly not excellent overall. The IGEP had the privilege to experience things that communicate in a sensible way, as one of the experts was present through Skype (Georgia, USA). The experts indicated that the facilities for computer science were limited and needed improvement. The funding seems to be growing and the regional industry participation is good even if the co-funding is limited to in-kind support. The research is strongly applied. The centre has produced 5 spin-offs, all in the electronics. The students seem to be highly attracted by the very close interaction with the researchers and the industry. However, the centre does not keep track of the alumni. The number of PhD applications are really good as is the industry career possibilities for PhD students. The international ambition is limited and might be developed in the future. There may also be a need for focus, since today the centre tries to cover (too) many areas. The centre performs a lot of formal and fruitful cooperation with one of the other four strong centres, i.e. FSCN, however having limited interaction with the other departments and centres.

Strategic outlook

There are good opportunities in the field of sensing technology and intelligent data communication. As there is much competition in this field from private and public organizations, STC is well positioned in this niche of industrial IT, especially in applied research. This demanding market is growing but if STC and partners manage to continue innovation, there is a growing market. The outside market has good buying power and is willing to contribute to successful applied research. For more fundamental research, national and international funds are available for good projects. Graduates and young researchers are willing and able to form spin off companies that can disseminate the acquired knowledge in an economic and societal profitable way. Besides applied research, there are opportunities in servicing and postgraduate training for the relevant sector.

There is a lot of competition in this field. Other publicly financed organizations may compete with STC on price. Some sectors of end-users will suffer from temporal or structural up and downswings. The funds available for industrial innovation

often change in time and in conditions.

The strengths of STC are with the dedicated researchers. They are competent and have the skill to understand what is needed and what is possible in applications. A long list of innovations to which STC has contributed can be presented. The novelty of the solutions is demonstrated by a number of patents. The productivity of the group is good, albeit not so much in the academic arena but the more in more applied fields. There are good networks with other groups in northern Sweden. The presence of related research centres and departments at the university adds to the scientific backbone of STC.

The weaknesses with STC are in the limitations of the university when it comes to increasing the numbers of PhD students and of the permanent staff. The problem of recruitment is not the number of candidates but the number of available places. Within STC, the disciplinary base is small, may be too small for the ambitions and needs of the market. The housing situation is not optimal. The collaboration with other departments of the university is limited. External funding needs continuous attention and is mainly received from project to project.

Recommendations to the research centre

1. Although the research centre has good working relations with industry in the region, the contribution to the research infrastructure of STC is limited. It is needed to develop business models and arrangements with industry or sectors of industry that do more than cover additional costs of applied research.
2. The focus of STC is on applied research. In the targets and performance indicators for STC, this has to be reflected and accepted in the university planning and control cycle.
3. The disciplines that are missing or weak in STC but needed, in order to do good applied research and more fundamental research (such as materials science), ask for good working cooperation with academic centres that can and will provide that expertise. Sharing knowledge and networks to mutual benefit can be a solution.
4. A smart IP policy is needed to protect the unique achievements of STC and to create value of inventions that return income for research purposes.

RCR – Risk and Crisis Research Centre

Description

The Risk and Crisis Research Centre (RCR) develops and communicates knowledge about risk, crisis and security with a particular focus on risk diversity, vulnerability, and capacity. The centre was established in 2010. The roots go back to 2003 when five

social scientists formed the research group Risk and Security in a Heterogeneous Society (ROHS) around a number of externally funded projects on risk. Today, RCR attracts over 30 staff members (13,5 FTE) of which 5 are professors (2,49 FTE). It may be noted that the figures show the number of staff involved, however the persons may be different over time depending on projects and subjects. The total funding is 13 MSEK per year of which more than 50 % is external funding. Faculty contributes with 1 MSEK for the managing and administration of the centre.

Observations

The RCR staff make a professional impression and show both self confidence and creativity in having chosen a research focus that is not mainstream in the safety and security field, yet discovered as a "missing link" in the Swedish portfolio, supporting better alignment with corresponding agendas internationally.

RCR has become very well known in Sweden and also among researchers in USA, Canada and Australia together with whom they write applications. They are also coordinating a Nordic chapter and together with the University of Trondheim they have applied for a Nordic Centre of Excellence that should be a virtual collaboration between Nordic players. The application has, together with four (4) others, been selected among 40 to go further.

Half of the researchers of RCR are sociologists. However, the centre has actively worked towards the establishment of an interdisciplinary environment. Seven disciplines are to some extent involved in RCR and the researchers claim they are collaborating closely with ETOUR, DEMICOM and Forum for Gender Studies.

The centre is very inclusive, describing itself as "a research hub", bringing together staff with common interests in risk research. The centre emphasizes that the staff members are co-working based on interest and benefit, not necessity, and that the researchers seem to be convinced with the benefit, or else they would not want to be affiliated with the centre. The centre also emphasizes that it is different from the other centres. For example in ETOUR, all the researchers belong to the same department, which may result in more connectedness.

Academic partners are Umeå University, Swedish Defence College, Lund University and University of Delaware, King's College London, the University of Jyväskylä, Finland; and Nord-Trøndelag University College, Norway. Non-academic partners are mainly public authorities, but there are also some private companies. Over the years, RCR has been successful in receiving external funding from agencies such as the Swedish Research Council, the Swedish Foundation for Social Sciences and Humanities, The Swedish Emergency Management Agency and the EU 7th Framework Programme for research (FP7).

The research is applied and closely related to education and collaboration activities. According to the criteria for a centre, RCR does not give education. However, two relevant Bachelor programmes (risk and crisis management, criminology) and a civil

engineering program (industrial economy) are run by departments. On the Master level, there are relevant courses (information system). Many of the students win prizes for their thesis, and several are PhD students now.

Cooperation and impact, visualizing the RCR motto – Bringing excellence together – is exemplified by open seminars, which in turn are part of the process establishing a Center of Citizen Safety. The yearly Åre Risk event is established by RCR, attracting 170 participants every time, giving the event good reputation. Of the participants 2/3 are from non-academic organizations.

RCR has a management team and a reference group with members elected by the Dean. The reference group is acting as an advisor to the centre. Before the reorganization of Mid Sweden University, the group had a more steering role.

Strategic outlook

The research at RCR focuses on risk and/or crisis from a societal perspective, in contrast to a psychological or technical perspective. Within this field, the centre focuses on everyday life crisis, which is a distinct niche and at the same time very broad, involving both risk, security and personal safety. The centre does not want to form a permanent research group. This is to be able to carry on being flexible and from time to time attract different people to different projects, which they presume will strengthen the research.

The main goal of RCR is to be an international centre of excellence for societal risk and crisis research. The centre has also formulated a number of objectives to support the overarching vision. However, the goals are qualitative and do not include measurable indicators which make them hard to monitor and evaluate, weakening the possibility to obtain steerage.

The centre is productive but the publications are not necessarily visible from the indicators. One of the biggest reasons is that much of the publications are chapters and working series that are not registered in Web of Science (50 %) also having low coverage in sociologic research. The researchers claim that they do not know why Mid Sweden University uses Web of Science and the Norwegian list to count the publications. However, the centre itself has not yet started a discussion about publication strategy. One person claims that DIVA is good for visibility and that it would be enough to tag the publication to be able to Google it, but of course also mention that the choice of database also is about status of the publication.

RCR points at the overall vision of Mid Sweden University, that it should be closely connected to the region. They claim that the centre is a good candidate since bridging many needs and being relevant to many players in the region, both public and private. However, the companies are small and rather expect that the researchers should pay them, than the opposite! RCR has tried to collaborate regionally and to coordinate applications and also employed one of the entrepreneurs to help connecting to the companies. In spite of 2-3 years of work, it did not give results. RCR has therefore established a cooperation with Combitech, which is 100 % financed by SAAB. The

company is also involved in the education.

The centre thinks they are well fit for being a strategic research centre and that they have a good chance becoming one. However, they question the relevance of the Mid Sweden University strategy regarding the requirement to be connected to a regional innovation system, since there is none in the region. Neither has it been clear to RCR what it is to be an innovation system. Earlier, there was a project (Safety and Rescue Region) financed by the regional fund, but it did not survive after the project funding because of not having enough large companies. RCR, on the other hand, is working with larger companies and wonders if it would not be better to develop a national platform and to move beyond the MidSweden region, especially since the partners are often located elsewhere and often in Stockholm. However, the RCR is also able to have people at many places participating in projects and also cooperating on virtual training at the same time.

The centre has identified that Security has got an own programme in Horizon 2020, which is positive. They are now writing new applications and are prepared for new announcements. The centre plans to meet the excellence goal by identifying key collaborating partners.

The market of security and safety is growing faster eastward than in Europe and the USA. Nevertheless RCR describe itself as being oriented towards the western world. So far they do not have other connections but are also reluctant to be connected to totalitarian regimes.

The researchers hold high to be independent, which they relate to being a social scientist. This will direct the actors to cooperate with, and on what terms. Especially to cooperate for income/profit is recognized as in opposite to keeping integrity. Furthermore, academic robustness is claimed to be of certain importance in the field of safety.

The centre is planning to increase the number of members of the reference group. The advantages that are listed in terms of being affiliated with RCR are: having a research environment and administration and communication support, priority of co-funding, making use of the network, seminars, newsletters, promotion of projects, collaboration with others and to be more competitive in writing applications. However, the researchers seem to be loosely coupled and the centre (the brand) is mainly used to find funding.

The centre finds it problematic that they have to allocate so much time for application work. Mid Sweden University has no formal grant office even if there are some help for international applications. RCR finds it very good to have specific money for writing applications and that a grants office is of great importance to fund large EU projects.

RCR has tried to spin off companies, but most researchers are not interested in being entrepreneurs, preferring to remain researchers. In spite of that, the centre has seen the possibility to create companies where the gain may be invested in the

research and refer to that Mid Sweden University will establish a holding company. For example, RCR could sell education but since it is not allowed for a centre to have employees, no one has time for business. Nevertheless, four innovations (IT- based methods and tools) have sprung from the RCR research.

The centre points at MIUN Innovation, who is supposed to support the researchers. RCR argues that they were very supportive before they moved to another building, but that they never hear from them now. The centre claims that if Mid Sweden University really want to focus on co-production, the innovation support should be reorganized as part of the research centres to be close to the environment were the researchers work. The researchers also wanted to know what entrepreneurs needed since the research is open and they would be welcome to benefit from it since the researchers would not be the ones who create the companies. The researchers also pointed to the template for the self-assessment report, not finding it relevant to the RCR research, since they do not for example register patents.

The centre claims that the figures in the self-assessment report in general are not correct, for example there are no staff members, i.e. according to the centre criteria the centre should not have staff of its own. They also found it very difficult to report about the budget of the centre since it is a question of how much each researcher wants to assign as RCR research. Researchers tick the box RCR if they think the money is used in collaboration under the umbrella of the centre. Although a principal investigator is deciding what an RCR project is, the loose couplings lead to some frustration. The experience is that there is no control over money and hard to cover management and administration.

For three important areas, the self-grading of RCR resulted in the following on a scale 1-8:

- recruitment: 6
- attracting external research funding: 7
- international positioning: 6

RCR found it hard to grade themselves according to the self-assessment template and whether or not the grades should refer to challenges and results in the past or in the future. When they discussed the grades with the advisory board, they advised RCR to raise the grades. Of the three areas the funding challenge is valid for the future perspective.

To maintain a beneficial social and professional cohesiveness, RCR strives to run at least one large-scale project at all times with many participants from different disciplines and university departments. So far it has been made possible through funding from the EU regional structural funds.

Recommendations

We think that RCR has unique opportunities filling a gap in the Swedish portfolio in the field of risk and crisis. Recommendations are primarily about:

1. Being more careful in how the projects should be selected and classified as RCR-projects and how the budget of each researcher should contribute to the centre.
2. Consider if the centre should focus the research within the societal spectrum rather than broaden it, and analyze carefully what competencies are needed, both internally and externally, to build an excellent interdisciplinary centre.
3. Consider the possible commercialization of the competence and results, which is not necessarily that the researchers are going to be entrepreneurs but rather to see how to get more value funding from both public and private organizations. The Åre risk event could be an excellent arena and starting point for building more in-depth relationships.
4. Make an environment analysis looking for emerging interests internationally, not only westwards, keeping the needed integrity as a scientist in the field of risk research.
5. Gearing up the work to find collaborating partners when applying for resources within the EU Security Programme.

SWSRC – Swedish Winter Sports Research Center

Description

The Swedish Winter Sports Research Center (SWSRC) conducts and disseminates winter sports research on a national and international level, with a strong focus on interdisciplinary research and development in physiology, biomechanics, and technology. The centre was created before Mid Sweden University was established. The research focuses on the integration of exercise and physical activity into sports performance, the general community, and the healthcare system. The centre uses modern technology in its laboratory and in the field, as well as promote interactions and collaborations between scientists from different disciplines. Several research studies were conducted in collaboration with a number of foreign universities. SWSRC is in the process of expanding the research to the area of effects of physical activity and training on individual health.

Observations

The centre demonstrated a firm dedication to remain a centre reputed for its excellence. SWSRC has a unique position in relation to mainly Swedish companies and other research organizations. Focus is on applied research but SWSRC is striving

towards more basic research and searching collaboration internally at Mid Sweden University. SWSRC will develop a research environment that can utilize and perform various projects in co-production with national and international companies. The team stated that it is important to belong to a university in order to gain ways of working and thinking. However, the relationship between departments and the other centres is unclear.

The SWSRC team showed self-confidence. They demonstrated a good perspective to education and the important connection between research and education.

From a resource point of view, there is an imbalance between staff and research and an increase of staff seems to be necessary in order to be able to expand the activities at SWSRC. The centre has not enough PhD students but has a strategic position in attracting PhD students. Not the least since the Bachelor level now gathers 25 students. The low number of PhD positions was described as a consequence of lack of strategy from Mid Sweden University. The centre believes that they have enormous potential but stated that Mid Sweden University reacts too slowly on this. The centre has undergone a major expansion, becoming one of the university's five research centres in 2008, and now considers itself being an important part of the university's research strategy. SWSRC's research is nominated as one of the four strong profile research areas at Mid Sweden University. However, it receives only 23 % of the budget as faculty funding, which is less than other research centres that are not in a profiled area. Mid Sweden University lacks a central organization for support when writing applications for funding. The researchers at the centre had the opinion that such a resource would be an advantage for them.

The yearly turnover for the centre is approximately 14 MSEK of which 27 % originates from EU structural fund. The percentage corresponds to the faculty funding from Mid Sweden University. The team did not seem to be too anxious about the fact that the EU regional fund will be reduced dramatically, hoping instead to be a part of Horizon 2020. The self-assessment, however, shows a low figure in attracting external research funding. Although SWSRC to a large extent co-operates with companies on an applied or consultancy level, the contribution from the industry is only 140 kSEK. They state, however, that new ways of thinking and approaches on commercialization and commercial awareness have gradually developed at SWSRC. Another obstacle in co-funding originates from the Knowledge Foundation preventing SWSRC from collaborating with certain bodies, i.e. tax-financed organizations that may be of certain interest, for example county councils, responsible for regional health care and rehab.

The statistics in the self-assessment document were not correct according to the team. It was also stated that Prof. Holmberg had founded three companies, which is not correct, since the term company founding in the template was misinterpreted as company funding.

Strategic outlook

The research team at SWSRC exhibits a performance with strong international collaboration. Good progress has been achieved during a relatively short period of time. The laboratories and equipment are of a high standard and in many cases unique. Good results have been reached in comparing results from laboratory and real conditions.

For three important areas, the self-grading of the SWSRC resulted on a scale 1-8:

- recruiting qualified staff and PhD students: **3-4**
- attracting external research funding: **5**
- the international positioning of the UoA: **7**

The overall aim of the SWSRC is to become a world-leading centre for research-based knowledge of performance and public health. The centre presents clear overarching goals in combination with measurable indicators for publications, staff resources, collaboration partners and funding from all levels.

The centre is highly relying on a few highly productive, and permanent, staff, and certainly one strong professor. The centre claims having a plan B and a vital discussion on how to overcome the vulnerable situation.

The team stated that Physical Activity & Health is an area with great potential, where knowledge from elite sport can be used to improve health and well-being among those who are untrained, which is an increasingly important area over the coming decades and a great potential for SWSRC.

Recommendations for the research centre

1. Sustain and develop further the research capacity of the centre to be able to benefit from future possibilities.
2. Where suitable and possible, the applied work and consultancy activities should be commercialised in a manner that would not be detrimental to the reputation of the centre. The centre should evaluate the possibility to COMMERCIALISE its know-how in tools and equipment by cooperation with suitable partners. It is important that all commercial negotiations are done by professionals, possibly on the Mid Sweden University level.
3. In order to broaden the research scope and funding cooperation with new segments of industry should be identified and cultivated.
4. SWSRC has the intention to use its competences from different sports on elite level in supporting public health. This is a big step and new competencies are needed. Those competences are not available at the centre. It is important that this new focus will not be detrimental to the good reputation of the centre. It could lose identity when broadening the scope.

FSCN – Fibre Science and Communication Network

Description

Fibre Science and Communication Network, FSCN, is a research centre within the profile area Forest as a Resource at Mid Sweden University. The centre has expanded quickly and has approximately 50 staff members engaged of whom the vast majority are researchers. FSCN has a complicated structure that partly is a reflection of the on-going process of building strong research profiles as opposed to the traditional research groups, each led by one professor. The strongest academic competences are chemical engineering and engineering physics. There are members in the centre that are doing some research outside the centre.

The strategic goals for the research at FSCN are:

- To consolidate research into Advanced paper materials to enable new uses for paper
- To grow Water chemistry research because it has many potential applications
- To broaden Mechanical pulping research to new applications for high-yield pulps
- To collect research under Industrial Symbiosis to help in the development of new bio-based value streams.

Observations

FSCN is extremely well recognised in papermaking internationally and has done an excellent job in this mature field in relation to its resources. The visibility has also increased nationally.

FSCN exhibits a good model in combining research and innovation and a suitable chain from basic research to industrial use. Nevertheless, the innovation contribution is often difficult to identify and quantify since the economic value comes through cost savings.

The research at FSCN has, for certain reasons, been concentrated to the traditional paper and pulp industry and organized to service the local industry. A process of change has started. The centre is on its move to new areas of research. In the research school, the majority of companies is outside paper industry. One new area concerns Waste paper and a research agenda is under developing. Own competencies are sufficient there. Another new area is the Clean water area. In the latter area, FSCN lacks some vital competencies that will probably be filled through recruitment. FSCN finds it extremely important that the centre continues to focus on the four established research areas and at the same time introduces the new areas. It was pointed out that long-time planning of fundamental research is important.

One half to one-fourth of the doctoral students are from the paper industry sector.

Despite this, the mobility among the graduated PhDs is low.

There is a big challenge in creating or moving to new research areas. The only way is to create and demonstrate competencies and through them convince the industries and the research community. The new areas do not have a regional and maybe not even a national strong industrial base. It is important with the material producer base involvement in the present as well as the new areas.

The infrastructure is considered to be of a good nature internally at Mid Sweden University and in networks with companies. Of special importance is the great interest from the top level of the companies.

FSCN is in a process of becoming more integrated with STC and a joint advisory board will be formed. The two centres have a lot in common.

The resources for FSCN have been reduced during the last years and that tendency will continue.

The goal in EU funding is to perform research in smaller collaborative projects with European partners. The capabilities to be more active as a coordinator of EU-projects are not in place. A pointed person is responsible for applications to Vinnova on a national level. FSCN has experts in science and has core expertise in the different research areas but lacks competencies needed in fund raising.

From a financial point of view, there is a big risk with the reduction of the funding from the EU structural fund although from the year 2015 onwards the EU structural funding will have a stronger focus on innovation than before. Another big risk is companies leaving the geographical area and the area of research.

FSCN benefits from belonging to Mid Sweden University through the funding of research, both faculty funding and funding from the Knowledge Foundation. The centre also uses support from Mid Sweden University in areas of administration, economy and law. FSCN finds that MIUN Innovation works very well in areas of e.g. patenting or creation of spin-out companies. The centre has several young spin-off companies (less than 100.000 SEK turnover). Spin-out is prioritized before patenting, in order to get a faster and more probable commercialization.

FSCN reports that they lack the knowledge of how to build EU applications. There is no real process on the university level related to prioritizing applications to different foundations, or building national and international road maps, which were asked for. There is no special budget for the transformation or change of research portfolio. Mainly reprioritizing the resources inside FSCN will do the transformation. However, the funding from the Knowledge Foundation will increase if FSCN join forces with STC.

The message from the management of the centre on crucial items that must be stressed:

- The organization is halfway between the old way of organizing and the profile way. The insecurity in the organization is detrimental

- Strong research is needed
- Funding difficulties that seems to increase

Strategic outlook

Strategically, FSCN is striving towards the following in its operation:

- A broader industrial base
- An enhanced international collaboration
- A higher academic ambition and quality

The following strategic goals for the research program have been identified:

- Consolidate research into Advanced paper materials
- Grow Water chemistry research
- Broaden Mechanical pulping research
- Collect research under Industrial symbiosis

The competencies and research experience are well suited to compete on the international arena. FSCN must be very cautious when entering new research fields so the excellent reputation will not be questioned.

For three important areas, the self-grading of FSCN resulted on a scale 1-8:

- Recruitment base: 6
- External research funding: 8
- International standing: 7

Recommendations for FSCN

1. FSCN should increase the collaboration and funding and at the same time increase the depth of research.
2. FSCN should rebrand the centre to a more future research institute with focus on new areas for forest material including new base material.
3. The centre should do scenario analyses of its programmes for future directions. The uniqueness must be found and niche tactics must be tested.
4. FSCN must be very cautious when entering new research fields so the excellent reputation will not be questioned.
5. The choice between recruitment of competence and collaboration for the new research areas must be examined.

CER – Centre for Research on Economic Relations

Description

The centre was founded in 2008 on the initiative of the businesses within the finance industry in the Mid Sweden region and conducts applied research on economic issues in the fields of banking, insurance, pensions, property and auditing. The operational activities started at the beginning of 2009. Each researcher may have between 10 and 50 % time for research and this will give 5 FTE (of approx. 15 staff members in total). 5 PhDs are in the pipeline.

Observations

The vision is to be one of the leading centres for applied research in the banking, insurance, pension, property and auditing areas. A considerable part of the financial resources is used for the area banking, insurance, pension (40 %) and the rest is equally divided between research in Property (20%), Audit (20 %) and Cross-industry (20%). CER is one of the leading research centres in audit, but see the greatest potential in banking, insurance, and pension, which is mirrored in the division of the budget.

Because of the diversity of projects in each of the four research areas, there are no formal sub-groups. Instead, research groups are formed at the project level.

In Sundsvall, every teacher is involved in CER. The staff both teaches and do research.

2012-2014, CER is still funded by EU funds and by CER members. CER has chosen to offer selected companies and public organizations in the five focus industries the opportunity to become members. At present 20 companies and public organizations are members of CER. They have paid fees for a three-year period for research and activities in the network unit. CER's board and network management team match their funding. The members are funding CER with at least 200.000 SEK, or 75.000 SEK depending on the membership level for a three-year period, which is used for co-funding the faculty money at CER.

The centre states that the cooperation with strong brands located in the region is attractive to students.

A Business Research Foundation in Sundsvall (Swedish:Ekonomiforskningsstiftelsen) is linked to CER. The purpose of this foundation is to fund particularly interesting projects in the five focus industries mentioned above. The budget is in total about 3,5 MSEK.

There is a strong link between CER and the business administration education offered at the Department of Business, Economics and Law.

The CER network was an initiative from the companies. To be regionally relevant, the centre works with research projects, projects strengthening the employers in the region finding employees (a kind of career network), and projects regarding skills development among the CER members' employees.

When inviting researchers to seminars, CER also invites member from companies. One researcher confirms that “the floor is full”. The events for mingling seem to be very promising and appreciated.

Norrporten (a property business) was present at the session and claimed that the reason for being involved is:

- Research
- When employing students from the Business administration program, they want to choose from the best and that those who live here will stay
- The other firms in the network are important tenants to us and we hope they will stay here
- I work in the potential employee group. Twice a year, we go to an event for high school students and inform them that they will meet companies/ employers during their studies and later on when looking for a job
- We can see that this increases the applications to the Business administration program with 50 %

A representative from the Municipality of Sundsvall was also present, describing CER as a special partner, saying that the companies outside the region have been surprised about the cooperation where industry is sitting together, and together with academia to be more attractive (“money valley”). The representative describes it as triple helix hands-on when CER involves people from the city, companies, the university, politicians, and the region.

Strategic outlook

The centre has a strong collaboration with regional society. 25 people together with researchers have been discussing what research should be focused. CER will do this again in January 2014. It seems that CER relies heavily on what issues the industry proposes. On the last board meeting the representatives of the banking and audit industries asked if it would be possible for the university to expand the education in banking and auditing.

CER’s external funding is currently shifting to specific project funding, which is said to enable the centre to enter bigger and more strategic projects. At the same time, CER comments that they have to have many subprojects to learn what is interesting and promising for future research, for example cash-free society.

The border between the Department of Business, Economics and Law (including the subject business administration) and CER is unclear. At the same time the CER-network members would like to increase the interest in the CER-network more broadly in the companies, for example by including activities on leadership, office environmental issues, staff health etc.

The profile of the centre is somewhat unclear and seems to be marketing and business relations rather than traditional banking research etc.

The internationalization is vaguely put and is depending on the international

presence of the regional partners. The centre would like to take it step by step and to look for individuals rather than universities and companies abroad. The centre would like to see that the companies (members) run the CER network (career and employment) in the future.

The centre claims that it is not possible (relevant) to cooperate with industry only in research. Therefore, the centre has a network unit together with the research unit. One is for potential employees and one is for existing employees.

CER has benchmarked centres at other universities for inspiration. CTF in Karlstad is an upcoming possible partner. CEFIN at KTH is already among the research partnerships. Internally, CER discuss with RCR who are interested in the fact that CER looks at financial risks, for example in banking and insurance. DEMICOM has been contacted but is not interested in adding financial issues to their profile.

CER is aware of the need to broaden the network because it is dangerous to focus on few companies, even if some have been in the region for 40 years and have 10-15 years tenant contracts.

For three important areas, the self-grading of CER resulted on a scale 1-8:

- Recruitment: 5
- Attracting external research funding: 5
- International positioning: 3

CER claims they have not been involved in producing the tables in part B of the self-assessment report and have not been able to comment on the figures in these tables. Recommendations

The centre is good in auditing but is investing more in the field of banking and also spread the funding in four areas of which two (property, cross-industry) are not clear in identity or research quality. The critical mass of researchers is small and the research is very dependent on a small number of researchers. The prime recommendation is to:

1. Carefully look at what is really the profile of the centre and to communicate it with proper branding.
2. According to that, find the right collaborating partners, both in academia and in the industry/public sector.
3. Consider if the research agenda should be more in the hands of the centre than of the members.
4. Identify international funding and what relations have to be developed to be able to apply for it.
5. Decide on a clearer border between research and services that seem to be more of consultancy kind.
6. Develop reports to show how the money from the members is used and how they can be geared up.

7. Develop a road map together with the companies to see what they need from research to stay in the region and how more and bigger project funding could be raised.
8. Look into the possibilities to combine the centre with a business school and also leave the career and recruitment services to other parts of the university or to the companies themselves.
9. Foster the Alumni network in a more conscious manner to build strategic relationships, not only in the region.

Assessment of strategic potential of the research centres for Mid Sweden University
The research centres are created to develop the university to be the scientific engine for the region. Hence they are supposed to:

- Do research of internationally recognised quality,
- Serve the social and economic needs of the region.

Being a university with a historically firm role in education, it is quite a challenge to become a research-based university. This takes time, a firm and steady policy, resources and support from many people inside and outside the university. The role of the research centres can be listed as:

1. Comply with international standard of scientific quality
2. Educate post graduate students into internationally competitive knowledge workers
3. Perform applied research for and in cooperation with the regional industry
4. Perform applied and fundamental research in national and international networks that ensure the position of the university as a qualified player
5. Unite research in the specific field
6. Ensure steady growth by external funding
7. Maintain the position of the university in the national and international labour market for academics.

From this we can derive a number of critical success factors. Each of the critical success factors corresponds to the role of the research centre in the profile of Mid Sweden University. These are evaluated by the IGEP on a scale from 1 (strong underperformance) through 6.

1. Average quality as reported by the expert panels
2. Number of theses by Master, Lic, and PhD. students
3. Cooperation with local industry and organizations as reported by the expert panels
4. National and international recognition
5. Bundling of research
6. External funding
7. Recruitment

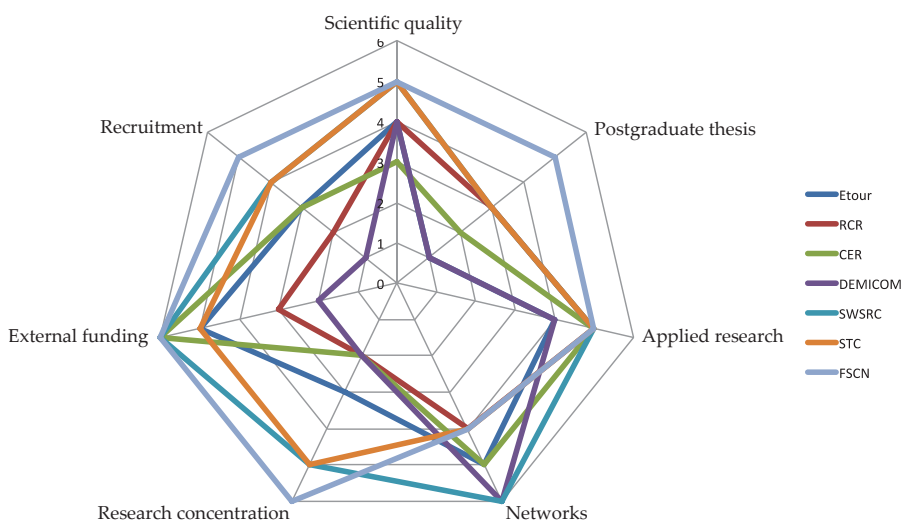
The interpretation of the grades of these criteria is similar to those used by the Swedish Agricultural University (SLU) in the KoN09-exercise, and is as follows:

Criterion	Score 1	2	3	4	5	6
Scientific quality	Poor	Inadequate	Moderate	Internat. Recognised	High International	World Leading
Postgraduate theses	None	Very few	Some	Significant	Excellent	Outstanding
Applied research	No importance	Little importance	Moderate importance	High importance	Very High Importance	Utmost importance
Networks	Poor	Inadequate	Moderate	Good	Excellent	Outstanding
Research concentration	Poor	Inadequate	Moderate	Good	Excellent	Perfect
External funding	None	Marginal	Moderate	Good	Substantial	Outstanding
Recruitment	Poor	Inadequate	Moderate	Good	Excellent	Outstanding

According to the IGEP, the scores for each of the research centres on the used critical success factors are:

	Etour	RCR	CER	DEMCOM	SWSRC	STC	FSCN
Scientific quality	4	4	3	4	5	5	5
Postgraduate theses	1	3	2	1	3	3	5
Applied research	4	5	5	4	5	5	5
Networks	5	4	5	6	6	4	4
Research concentration	3	2	2	2	5	5	6
External funding	5	3	6	2	6	5	6
Recruitment	3	2	3	1	4	4	5

This also can be expressed in a radar diagram:



The diagram and the table show the weaknesses of many research centres with respect to postgraduate education and recruitment. The scores on external funding (quantity and share in funding of research) have to be improved with a number of research centres. Applied research is strong in all research centres, there are however differences in quality and quantity of academic research. And networks are well developed in all research centres.

The overall conclusion is that all research centres contribute to a high extent to the regional mission of the university. But a number still has to grow in quantity and quality of academic research.

Ideally, all research centres should score “6” in all fields. The question is whether this is realistic. In some cases the research centres will stay small as they rely on a narrow niche of research or are dependent on a small number of very productive researchers. Such centres will never reach critical mass to become internationally competitive and recruit students and staff from elsewhere.

On the other hand, the university has more than 30 postgraduate programmes (Master, Lic., PhD). One would expect that such programmes in a research-based university are connected to or interwoven with strong research groups or research centres, to ensure that the level of the courses is state of the art and to ensure that the next generations of researchers are educated in the own university. The present research centres fulfil this need only partially.

The conclusion is therefore that the coverage of subject by research centres of Master and PhD programs has to be increased, or the number and variety of postgraduate courses diminished. This, of course, will harm the impact of the university as a whole in the region and in the Swedish system of higher education.

Recommendations

To Mid Sweden University

1. Consider redefining the university strategy in an interactive process in the management of the university including external stakeholders. Then develop a shared implementation plan for that strategy.
2. In order to serve the region, the strategy has to be to import know-how from partners worldwide that is of value to regional needs.
3. Clarify the managerial responsibilities and management tools for directors of research centres. More control on resources, quality, and direction of research lines. Who is member of the centre and who is not.
4. Consider developing a contingent process of research management including QC, HRM, monitoring, planning and control cycle.
5. Consider reducing the number of research centres, in order to obtain better critical mass and visibility of the centres. Keep focussing on a limited number of subjects. Reduce the research outside the centres.

6. Address the weak central support for research. Try to increase the budget for research in the centres by increased faculty funding. Reconsider the system of overhead charging. Coordinate grants application institution-wide.
7. Consider establishing standards for quality of research and how to value good – excellent and “leading”.
8. Consider increasing competitiveness and competence through collaboration with research organizations elsewhere.
9. Look for opportunities to increase the interaction between education (especially post graduate) and the research centres.
10. Develop structures for evidence and knowledge-based services to the industry and the region, and relieve researchers from these duties.
11. Consider improving management information about budgets, forecasts, matching capacity, performance, data, registration and the like. And update websites frequently.
12. Make English the second working language. Make Master and PhD tracks in English or bilingual.
13. Consider developing a more entrepreneurial attitude in the university. Develop structures for valorisation of know-how without putting the burden on the researchers.
14. Consider developing a system of education, training, coaching and start-up support for entrepreneurial students who want to start a knowledge based company in the region with the know-how of the centres.
15. Consider the further development of the holding company to increase external funding and earned income to be invested back again in research in the university.

4.2 International Scientific Expert Panel Reports

4.2.1 Research Field 1: Economic Sciences, Law and Tourism

UoA 1.1 Center for Research on Economic Relations (CER) Faculty of Human Sciences

Experts: Prof. Miriam Scaglione, Mrs Stina Algotson, Prof. Peter Berck,
Prof. Falconer Mitchell, Prof. Inger Johanne Pettersen and Prof. Soile Veijola.

General assessment

CER is a small and specialized unit, focusing on the banking, insurance, pension, property and auditing industries. This unit is an important asset to MIUN and has the potential to spearhead a drive to create a high quality business education and research unit. This unit merits prioritization in the university's allocation of resources.

The unit has made great effort to build a large and complex interaction with the regional business community. As a result, the unit is able to do their research using original data generated in collaboration with their industry partners. However, in order to keep their partnership and their access to original data current, it takes a considerable amount of time and effort on behalf of the staff. The partnership also has educational benefits as their students are recruited by these firms.

The lack of permanent research funding provides limitations on how this unit can evolve. As they see it, they have reached the largest size they can reach because the educational part of the FTEs is limited. They do not see a way to grow by adding disciplines, like finance, to their group. They have discussed this and in addition to the matter of getting the additional teaching resources, they do not see themselves being able to build partnerships in the local region that would support such an effort.

We see this group as exemplifying what a school of business does. They work on problems that are important to business, in collaboration with the business community. They publish their results for an international audience. They provide their students with a solid entrance to the business community.

Quality of research

Grade: Very good

Many of the papers published in this unit are in high quality journals, recognized as important in the field of accounting. Behavioral Research in Accounting is on the top Nordic level. The tables, from part B, provided on citation do not seem informative. We find that the work in this unit is well cited. For instance, Peter Öhman alone is cited 157 times in Google scholar count and Martin Johansson is cited even more.

Against a comparison group of UK accounting units they would rate just below the very top units. The other specialization, marketing, is also pursued at a very good level of quality.

This unit is performing at an international level and we rate the quality of research as very good.

Productivity

Grade: Very good

Productivity in this unit has been a strong upwards trend. For the last year reported, 2012, there were 15.5 peer reviewed articles produced by 3.74 research FTE. We think that four refereed papers per FTE is very good to excellent productivity. In the earlier years for which we have data the productivity was less and in the early years far less. If the unit can maintain this level of output, it will generate a track record of impressive international research.

The unit has a very strong record of promotions. In our interview, they stated that they have five assistant professor to associate promotions. The table cuts off in 2012 and shows two promotions. There is also a Ph. D. promoted to licentiate. Again, we feel this is a very good record for a unit with 15 head count that has existed for only four years.

Research environment and infrastructure

Grade: Good

The unit has a pleasant and constructive research environment, based on a model where the academic staff all seems to be involved in all the activities of the unit as well as education. They have built an organizational structure that supports their research, their network with regional business, and their students. They have a strong academic research network in Scandinavia.

Research networks and collaborations

Grade: Very good

CER thrives on its collaboration and networks. They are well aware of the need for them to do world class research while not forgetting their regional base, which is their source of support. They are currently engaged in producing two volumes, one in Swedish, one in English, in collaboration with coauthors from all over Sweden. They aspire to have further international links, but have yet to realize this ambition.

Impact on society

Grade: Very good

CER gives several examples of how their research is used in their self study. One example is that they looked at the use of the internet for insurance transactions.

While banking transactions are commonly online, insurance transactions were not. Based on their survey of insurance customers, the industry was able to redesign their internet presence to move more transactions into this medium. The payoff for CER was also academic as this was part of one of their academic publications. In general, CER is very aware that they are not consultants, but rather a research organization. They have done very well to produce both internationally valuable knowledge and measureable benefits for their network partners.

Their networking activities have also had a real effect on the labor market for business professionals. They have been able to find local and appropriate positions for their graduates, who then stay in the mid-Sweden region.

Strategies and plans for development and renewal in the Unit of Assessment

Grade: Good

CER does not have a clear conception of their future development, particularly in the longer term. Mainly this is because of the financial uncertainty facing research centers. It is also a function of their failure as yet to develop international research links. The junior faculty is making appropriate progress in their careers.

They are able to create an excellent research agenda in collaboration with their board members.

Grades

Grades	Quality	Productivity	Infrastructure	Collaborations	Coproduction	Impact	Renewal
Excellent				*			
Very good	X	X			*	*	
Good			*				*
Insufficient							

Note: The cross shows the evaluation obtained by the experts' consensus whereas the star shows the mean of divided expert opinion

Recommendations for development

1. Mid Sweden University should recognize this unit as having done a fantastic job of building a research institute with strong regional ties. This unit should be thought of as an important asset for MIUN, particularly if MIUN expects to ever have a national reputation in business.
2. Core research funding for younger faculty needs to be increased. The career progression of assistant professors and the ultimate standing of MIUN depends upon these faculties having some university paid research time.

3. One next step for this unit is to further raise their international profile with collaborative links to foreign universities and visiting professors.
4. When MIUN is ready to expand the scope of its offerings in business and economics it should consider how new hires can benefit from and add to the business ties CER has built.

UoA 1.2 The European Tourism Research Institute (ETOUR) Faculty of Human Sciences

Experts: Prof. Miriam Scaglione, Mrs Stina Algotson, Prof. Peter Berck,
Prof. Falconer Mitchell, Prof. Inger Johanne Pettersen and Prof. Soile Veijola.

General Assessment

This is a very hard working unit that raises from half to two thirds of its own funding. Its members are important regional, national and international producers of new knowledge in tourism research. Their findings are distributed through books, general articles and reports. They also have an active collaboration with the tourism sector, where their research findings have been influential at both the regional and national level. ETOUR is well deserving of the support of MIUN. There is a strong logic in offering this support based upon the location of the unit, the growth projected for the tourism industry in Sweden, and the economic importance of the sector locally. They fit well with MIUNs emphasis on mountains. They are the largest tourism research group in Sweden and equal in size to the other large tourism research groups with which we are familiar.

The unit appears to be harmonious and well organized in its research, educational, and outreach missions. The staff seems to share their research interests both formally, in seminars, and informally at coffee on an everyday basis. There is a definite sense of team spirit in this unit even if the profile of research is rather heterogeneous on the level of topics.

Quality of the Research

Grade: Very good

We have ranked the unit's research between good and very good, reaching this conclusion within the framework of publishing in the world's leading journals.

In the unit, there are more than a sufficient number of refereed journal articles. These articles are tied to the funded research and are generally of an applied nature. The unit publishes relatively few papers in journals indexed in the Web of Science or on the list of top journals. This is principally because tourism as a separate research field has only got two journals that are indexed in Web of Science. Tourism is a relatively young field of academic endeavour, marked by several research paradigms across several disciplines. This makes undisputable and straightforward quality rankings impossible. The lack of ranked journals dedicated to tourism results in few citations in the tables even though one of the researchers, Matthias Fuchs, has an impressive number of citations within his field of studies, e-tourism. The citation count is also a result of staying with tourism as a field to publish in rather than also publishing in journals in fields like regional science, geography, management,

marketing, sociology, cultural studies and economics. The other tourism center that seems comparable in focus, though much smaller, is at Gothenburg's University School of Business. The listed publications there are in the same outlets as ETOUR. We believe that ETOUR will not be able to claim their desired "number one in Europe" position without its members regularly publishing in better ranked journals.

Productivity

Grade: Very good

In the review period (6 years), the researchers of ETOUR have produced 56 peer reviewed papers, 57 conference papers, and 86 other documents, including reports, books, book chapters, etc. During this time period we believe that they had an annual average of 17 head count researchers. That is an average of approximately two outputs per head per year. When one looks only at peer reviewed journal papers, it is about 0.5 per head per year. It is unclear how much effort of this unit goes into their industry collaboration and how this subtracts from the headcount available for published research. There is potential in this unit for further increase in output per head, especially if MIUN provides additional funding not tied to sponsors.

There were two promotions in 2007. We are unclear about how many members in this unit were potentially eligible for promotion.

The strongest aspect of their performance under this heading has been their ability to consistently raise external funding.

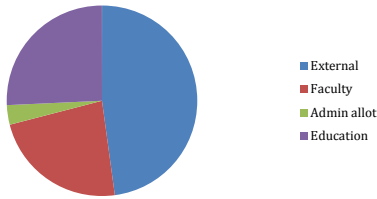
Research Environment and Infrastructure

Grade: Very good

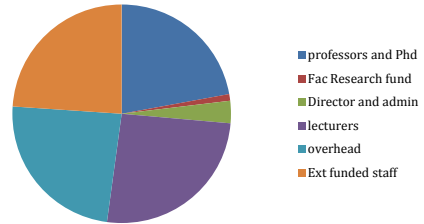
The research environment and infrastructure are very good. This is a well-organized and ably led unit, with appropriate facilities. Members of the unit participate actively in the academic community. There is an impressive staff profile in terms of their internationality and gender mix. However, the unit, with three male professors, lacks female professors and needs to support their existing female members in a way conducive to their being promoted into and within the professorial ranks. This needs to be a strong priority.

The funding sources and expenditures for the totalized department and ETOUR are summarized in the pie charts below. The key factor shown in these charts is the predominance of grant funding and the very valuable MIUN contribution towards administration of the center. It is this contribution to a continuing center that makes the grant funding at this level possible.

Sources of Funds: Total 30.3M SEK



Uses of Funds: Total 30.3M SEK



Networks and Collaborations

Grade: Very good

This unit is known for the breadth of its collaborations, listing 89 collaborator research grants, both national and international. They have an active program of international visitors and participate extensively in national and international conferences. We rate this unit as very good in terms of its academic activities in networking. However, in order to further develop and strengthen its profile as both a regional agent and a truly multidisciplinary academic research unit – with an unquestionable international position – ETOUR would benefit from broadening its exchange and collaboration with social, political and cultural theory and theorists which would be particularly useful when analyzing tourism from the point of view of working life, social relations, nature, culture, community as well the human needs and motivations.

Co-production

Grade: Excellent

The unit is very strong in its regional co-production and strong in co-production on the national level. Indeed, their research grants often involve the tourism sector and close cooperation. This has been true since the inception of ETOUR, some 16 years ago. The case studies presented in their materials and their presentation to us, as well as comments made by a representative from Naturvårdsverket, convince us that their co-production is a key to their success. Much of their co-production is recurrent as is their funding. This is a strong indication that their co-producers are satisfied with what they do. The co-production that we have seen has a strong element of private sector and public benefit.

Impact

Grade: Very good

ETOUR has had impact that we rate as very good. We explored two examples where ETOUR's impact was evident. ETOUR worked with a local destination company to increase the utilization of the local resort area. Their research pointed the way to

extending tourism to the low season and a full year basis. This turned out to be quite successful and the local destination company said that it has resulted in investments exceeding 3 billion SEK. ETOUR also worked with the government agencies on the creation of a national outdoors policy. They are now involved in evaluating the effects of this new government policy.

Strategies and Plans for development of the Unit

Grade: Very good

While the unit is in some sense mature, having been in existence for 16 years, its plan seems to be to continue as they are going. While this is not entirely a bad outcome, it does not really position the unit for potential future growth – be it in the form of raising the size of the staff or funding or growing in terms of its disciplinary range. This was most apparent in the gap between their desire to become “Europe’s number one tourism research institute” and their current position. We also did not hear of any plan concerning the development of their younger faculty. We are particularly worried on this latter point as the unit is not strong in refereed journal articles, which are the sine qua non of faculty advancement.

Grades

Grades	Quality	Productivity	Infrastructure	Collaborations	Coproduction	Impact	Renewal
Excellent					*		
Very good	*	*	X	X		X	*
Good							
Insufficient							

Note: The cross shows the evaluation obtained by the experts' consensus whereas the star shows the mean of divided expert opinion.

Recommendations

The unit merits considerably greater support than it currently gets for the following reasons:

- a) the impressive profile it has established in regional and national applied tourism research
- b) the fit of its established reputation to the university’s aims, and
- c) the considerable potential for the unit’s growth and improvement in research.

Support could take the form of:

1. extended permanent funding for research staff
2. allowing the unit new teaching initiatives to raise research funding
3. giving temporary funding where necessary to cover new contract gaps and delays
4. enhancing facility for the unit to build up a reserve to be used as a contingency fund.

All of this would help alleviate the extreme financial uncertainty that detracts from the unit its ability to fully realize its research potential.

Moreover, we suggest that the unit

5. takes more advantage of their ambitious visiting professors program in order co-produce research and scientific articles to improve the internationalization of their research
6. develops a clear strategic plan to explicitly specify the steps it will take in order to move from its current position to being the number one among European research units for tourism research.

UoA 1.3 Business Administration Faculty of Human Sciences

Experts: Prof. Miriam Scaglione, Mrs Stina Algotson, Prof. Peter Berck,
Prof. Falconer Mitchell, Prof. Inger Johanne Pettersen and Prof. Soile Veijola.

General assessment

Research in the area of business is largely carried out within one of three projects. CER is a center and fully covered in its own report. Societal Entrepreneurship in Sparsely Populated Areas (SESPA) and Growth in Women Entrepreneurship (GWE) are large multidisciplinary research programs. SESPA investigates societal entrepreneurship, harnessing new ideas to accomplish societal, rather than business, change. GWE starts with the observation that women entrepreneurs are less likely than male entrepreneurs to increase the size of their businesses. GWE considers a number of possible interventions to increase the success of these businesses including increasing the network size and training.

As a unit, Business Administration (BA) has considerable research expertise in auditing (located in CER), entrepreneurship, and marketing and less research expertise in other areas in business such as applied economics, organizational behavior, real estate, finance, forecasting, etc. When one adds the current research expertise in economics, and the geography/ETOUR unit, this remains true. A long term plan for these units needs to carefully consider the viability of the BA. The breadth of core business research needs to be expanded. It is our opinion that without faculty members active in research, not just teaching, in more of the core business subjects (cited above), the research enterprise across all of these units will ultimately wither.

Given how recently this was a totally teaching oriented faculty, the accomplishments of the BA are very impressive. The general area of business, which we view as including not only the units in business, economics, and statistics, but also the centers ETOUR and CER, are an excellent opportunity for MIUN to show regional leadership and achieve excellence. BA has already accomplished the hardest part of (1), building a research network of business and government partners and (2), developing an entrepreneurial culture. MIUN should be very proud of what has been accomplished in this unit and supportive of its further development.

Quality of research

Grade: Good

The overall quality of research is good. The quality of the unit's research is uneven, ranging from good to very good and possibly even excellent. A few of the professors have reached the level of having international reputation and publishing at least

once in one of the best journals. The recent book projects with Springer will certainly raise the unit's visibility. Taken as a whole, the unit suffers from too many of its publications appearing in low or unrated journals. Going along with the choice of lower level outlets are an uninspiring number of citations.

To some extent we are sympathetic; in that a unit that was largely not doing much research at all as little as three years ago now has a creditable research program. To some extent, however, we are not sympathetic as we don't think many of the unit's members fully realize academia's current expectations for statistical (or econometric) and theoretical sophistication.

Staff should be more ambitious in the journal outlet they pursue for their work. Increasing the quality of the research output will require the unit to aim higher.

Productivity

Grade: Good

Productivity in this unit is good. In 2012, there were more than two journal articles per research FTE, which we think of as low. There are also two books.

Since the inception of SESPA and GWE in 2010, the graduate program has taken off. All but one of the 8 graduate students that started in these projects has finished or is scheduled to finish before 2015. Six will complete in 2014. The graduate students associated with CER are reviewed elsewhere and also have made excellent progress. This would be an excellent record for any department and when one considers that before 2010, there was no program to work with graduate students in this unit at all, it is a remarkable record.

We have not been able to make a firm assessment of the progression through the ranks of all the members of the unit's staff. This is because the unit's senior staff members were not aware of the promotion history within the unit.

Research environment and infrastructure

Grade: Good

The environment and infrastructure is good. BA is in transition as its units are split between two campuses and it has only recently become part of a larger unit. Where the research center and projects are examples of building well-functioning, ably led units, we do not yet know whether BA or the larger business, law, and economics unit will be functional.

Gender balance is a problem for this unit, particularly in the new hires. On the other hand it is gratifying to see that the department has some strong female senior leadership. There is not much internationalization of the staff.

Unit research is based on some impressively won research funding.

Research networks and collaborations

Grade: Good

The unit is strong in national collaboration, but much less strong in international cooperation, particularly beyond the Nordic region. Both SESPA and GWE are effective multidisciplinary collaborations. The recent English language Springer volume shows off their national contacts and is exposed to a wider audience.

Coproduction and external non-academic cooperation

Grade: Excellent

All three of the major research projects are organized around co-production. For instance, GWE teaches women entrepreneurs' business skills and creates business networks for them. SESPA works with local and county government to instill transformative change into these organizations.

Impact on society

Grade: Very good

CER (reviewed elsewhere) and GWE have identifiable impact on their coproducers. The EU commission has recognized GWE as a flagship project. They have created a Social Innovation Park in order to promote Social Innovation; for instance, considerations of radical alternatives to convention public services, such as schooling, health assistance, etc. They also initiated a national social innovation award.

Strategies and plans for development and renewal in the Unit of Assessment

Grade: Good

Good, at best. The unit simply doesn't see where to go next. Nor does CER. The unit has made a major transformation to being a creditable research institute and it is perhaps unfair to ask what they will do next while they are still engaged in adjusting to their newly found position both in the research world and as part of a larger department. All units we talked to, mainly saw them hemmed by available research funding and teaching funding.

The problem here is that business is part of a larger unit and the larger unit is now actively engaged in its planning.

A key member of research will soon retire. This will impair the unit's ability to do top quality research.

Grades

Grades	Quality	Productivity	Infrastructure	Collaborations	Coproduction	Impact	Renewal
Excellent					X		
Very good						X	
Good	X	X	X	X			X
Insufficient							

Recommendations for development

1. Clarifying and defining the relationship between the three research centers, and between the teaching unit and research centers. In particular, considerations should be given to establishing a center for research in Entrepreneurship. The two existent projects, SESPA and GWE, could be in such a center.
2. The unit (or the larger department) should make faculty promotions a priority. Among the things that should be done are:
 - a. facilitating junior staff promotion;
 - b. aggressive efforts to find funding for faculty to attend major international disciplinary meetings;
 - c. aggressive efforts to find funding for faculty members to upgrade skills through attending short courses;
 - d. encouragement and help in finding research funding.
 Moreover, measures should be undertaken in order to ensure the replacement of the key senior researcher that will shortly retire.
3. The BA unit and the whole department should give consideration to the business specialties that they offer and the depth to which they wish to pursue them.
4. While the department won't be a full service academic business school soon, it cannot be defined by its coproduction. Therefore, BA must navigate between these extremes.

UoA 1.4 Economics and Statistics
Faculty of Human Sciences

Expert evaluation was not performed due to the absence of self evaluation report.



4.2.2 Research Field 2: Health Sciences

UoA 2.1 Swedish Winter Sports Research Centre (SWSRC)
Faculty of Human Sciences

Experts: Prof. Annie Rouard, Prof. Paola Cesari, Manager Petra Dannapfel,
Prof. Elizabeth Kendall, Dr. Laurie Lachance and Dr. Tony Ryan.

General assessment

SWSRC is a laboratory with a clear, visible identity, and is well integrated in the social and economic territory. The lab is one of the best in the field on a global level, with strong coherence between research, sport performance, industry and local development.

The laboratory is focused on the physiology and biomechanics of winter sport performance. Historically, SWSRC was working on cross-country skiing before expanding their applications to alpine skiing and other sports such as cycling, swimming and latterly diving.

The physiology is concerned with limiting factors of performance: i.e. maximal aerobic capacity/ different exercises modes/ upper and lower body exercises. Biomechanics is focused on muscular strength and power endurance. The combination of both allows the possibility of the evaluation of economy and efficiency (cross physiology and biomechanics).

Recently, the lab developed two new axes. One is related to high-tech equipment, using smart phone applications to track the parameters of physical activity in the environment. The second one is linked to a tourism program combining forest and outdoor activities.

Winter sport is a very good choice because of the local society, economy and sport environment.

The center works in an applied way. They work with top level athletes and coaches in a training assistance context to improve performance and training processes. They also have some collaboration with companies for the assessment of sport equipment, as well as with the county council.

Few permanent researchers are working in this lab, compensated by numerous postdoc, PhD and part-time national and foreign researchers. In this way, they have built an international network around winter sports, which includes biomechanics and physiology. This network is reflected in its high international attractiveness. SWSRC completes the funds given by Mid Sweden University and were able to get extra funds from different institutions, either public or private.

The scientific production has increased exponentially from 2007, with outputs achieving good impact factors.

Quality of research

Grade: Good to excellent

The research is of a high quality in the sports discipline, with complementary studies in the field and in the laboratory.

A particular strength is the methodologies they have developed for in situ data acquisition (tools, methods, ergometer and protocol). This is not usual in the Sports Sciences area in which most laboratories limit their investigations to the lab as a result of the difficulty in making data acquisition in outdoor conditions. Consequently, many of the tools on the market are not well adapted to in situ measurement. The lab investigates the development of its own equipment which is adapted to extreme cold temperature, without limiting the data collected. This is important because the sport subject's movements are often complex and subtle and the Centre's work allows an analysis of these factors along with an exploration of power and economy of movement. This is remarkable, and it takes a lot of time to achieve reliable sensors and systems that can perform reliably in these extreme conditions. In addition, there are few industrial applications of this nature due to the restricted number of teams working in this area.

In comparison, the data treatment and statistical analysis appears poor. This is a limiting point for studies carried out on such complex movements that could not be reduced to few parameters with means and bivariate statistics. Data treatments have to perform a different kind of time dependent relationships between the studied parameters.

Much of their research is conducted in a descriptive way, which is the first step of the research process, especially in complex ecological conditions.

However, the resulting analysis is not sufficient in regard to the fundamental mechanisms involved in human movement. More, the results were not analyzed with a view at previous models on human muscle or on the mechanical or the dynamical field. This is a limiting point on the contribution of this research to the knowledge of human movement. The comparison of the results with existing models could bring some explanation about the mechanisms involved in complex movements, such as multi-joint flexion-extension of trunk and upper limbs in cross-country skiing and could conversely point out the limitations of these models, which have been developed for elementary movement such as controlled elbow flexion-extension.

MIIn addition, the problem appears numerous and dispersed without a strong scientific line. (Winter sports cannot be a scientific line but represents an application line)

Productivity

Grade: Very good

The lab presented a high rate of publications increasing through the years with good impact factors, especially given the limited number of researchers engaged in the work.

The lab appears very strong in the area of technology applications and development either for original ergometers or athletes monitoring or suits or other application in health area (new concept to reduce mass/fat).

	Number	IF	Citations	Others
Articles	86 (8 in 2007 -> 28 in 2011 ↔ strong progression)	2>5 - 11>4 - 18>3 41>2- 20>1 - 15<1 7 noIF ↔ large panel, high mean	252 (55,5 in 2010)	3,84 authors / paper 1,59 countries / pap ↔ reflect international collaborations
Conferences	80			
Communication	Very good communication ranging from local to international medias (TV, journal...) ↔ strong visibility			
Tools development	7 Ergometers for upper and lower limbs, some specific for disabilities, 1 ski simulator, jumping machine			
Contribution to products innovations	Suit for warm and humid environment, smartphone movement application for skier, alpine helmet, cross country poles			
New process	Computerized biofeedback system, concept to reduce body mass/fat, waxing iron application			

Research environment and infrastructure

Grade: Low for staff, excellent for equipment and grants

The staff is composed of three Professors, one Associate Professor, one Senior Lecturer, four Post Doc, two PhD students, one engineer and two Research Assistants. One professor is strongly active in the lab whilst the two others appear poorly involved. There are no women involved in the leaderships of the center.

To compensate the lack of staff and to complete a team with sufficient competencies,

SWSRC have recruited four foreign researchers (all on 20 per cent FTE). There are few PhD students and no Master students.

Nerveless, **the permanent staff members are very few** to carry out the range of activities. The **leader** has been involved in the Centre since the outset. He was/is very strategic, active, productive and innovative and this has contributed massively to the development of the Centre. His management capacity has helped in establishing a lab which is strong and has a really efficient organization.

He has also developed a young team around him, and whilst this is good the Center has to be careful **if it is to continue this sustainable development**. The Centre must anticipate a **task redistribution** not based on only one central figure. They should start by dividing the direction of the Centre into administrative and research divisions. This must be achieved because at present the newly incumbent Director is a Senior Lecturer doing 50% education, 20% research and 30% lab administration.

SWSRC recruited a **grant officer** who conducts the lab to get various extra-funds (Swedish National Centre for Research in Sports, Swedish Governmental Agency for Innovation systems, Swedish Olympic committee). This is a good strategy that could be **relied at the university board level**. It has the potential to gain more international, national or European grants. Importantly, this specialist role is required to carry out these professional competencies which are separated from the specialist skills of the researchers.

The different rooms of the labs are very well equipped **with high-tech equipment** either for biomechanical approach (force plates, motion capture system) or in physiological field (K2, lactate analyzer). Moreover, the lab seems to contribute to equipment development via collaboration with the industry (Qualysis).

Research networks and collaborations

Grade: Very good

SWSRC presented an effective strategy for national and international collaborations to the panel, reflecting an **open mind and a real attractive position**. These collaborations are related to their research strategy and focus, but also to the scientific skill gaps in the SWSRC team. For each project, they build collaboration in order to get all the competencies required.

Their collaborations with foreign labs are all around **the world**, with labs strongly specialized in winter sport research such as the University of Salzburg, the University of Verona, the University of Ljubljana, Colorado Mesa University and the University of Jyvaskyla. They maintain **high level researchers** (from Denmark, Germany and Austria) for part-time positions and who are really involved in the projects of the lab and publication.

At the **national level**, they have strong partnerships with Karolinska Institute in Stockholm, University of Gothenburg and the Swedish School of Sport and Health Science in Stockholm. These collaborations have increased their competencies in the

physiological and biomechanical fields.

To develop original tools adapted to in situ investigations, SWSRC has developed a collaboration with the Swedish Institute of Computer Science in Stockholm.

Coproduction and external non-academic cooperation

Grade: Very good

SWSRC, as a Centre, **existed before the Mid Sweden University**. Even before they were integrated in the Mid Sweden University, they had developed their **relationships with sport organizations** at a national and European level (Swedish Olympic Committee, Sweden Ski Association, and Swedish Biathlon Federation). The main goal of these relationships is to improve athlete's performance and to give technical assistance to the coaches. This kind of evaluation activity is a heavily time consuming one with limited application for research.

They have also developed some **partnerships with the County Council** in order to be an active contributor to the local development (see impact in next society chapter).

They have investigated partnerships with **companies** involved in winter sport equipment, contributing to innovative products such as poles, helmets and suits. These collaborations are conducted in a strong, **interactive way**. The lab has tried to transfer its knowledge in winter sport to improve sport equipment. They also analyze deficient products to find reliable solutions.

Impact on society

Grade: Very good but too limited to high performance

The impacts on society are related to the sport community and to R&D projects with companies (see previous chapter for these two impacts).

More recently, they have developed a partnership with Peak Innovation. This will lead to a larger societal impact and reinforce their contribution on the local development (Jämtland regional tourist industry).

Sport is a major part of the leisure and tourism industry in the area. Jämtland appears as one of the most touristic destinations in Sweden, especially for winter sports. The Centre is focused on high sport performance, but their knowledge and competencies could also be used for public leisure, health and physical activity applications. This is an original approach not well represented in other sports sciences labs, original firstly, because of the links with the local economy and secondly, because of the transfer and adaptation from high level sport to common practices either for equipment or for technical ability or the type of exercise. This approach is consistent with the increase of experiential tourism. For example, in this way, the development of smart phone applications for top level athletes could easily be directed to use in the general public and to explore the effect of particular forms of physical activity on health outcomes.

Strategies and plans for development and renewal
in the Unit of Assessment

Grade: Insufficient

SWSRC indicated clearly how they follow and want to stabilize their current strategy focusing on

- the international and national scientific collaborations
- the integration in the local economy and partners (Jämtland regional tourist industry)
- the relationships with sport institutions.

The scientific strategy is not well presented.

Recommendations

These recommendations are related to the limitations of the center:

• *Related to the staff :*

1. SWRSC has to **increase the number of permanent staff** who are resident in Östersund and will be engaged more fully in the local development of the center.

2. They also have to **increase the number of PhD students**. They have started a Masters curriculum this year, which will provide a pathway for PhD students. However, they will need to attract grants or develop some co-financial supports for PhD students in collaboration with companies or the county council. It may also be possible to integrate the Erasmus Mundi program into the center.

3. They have to **reorganize the management of the team** so that the center is not so heavily dependent on only one leader if they are to be sustainable in the long-term.

• *Related to the scientific development:*

1. Within MIUN, SWRSC appears to be more related to the natural sciences than to the human sciences. However, they will need to build on the basic scientific disciplines to reinforce this connection. The team has to **incorporate fundamental research** into its overall agenda to be able to analyze the mechanisms that could explain their applied results. This type of analysis goes beyond descriptive analysis and will require a focus on one or two scientific disciplines. They can reinforce their team in this scientific discipline in two ways: (a) through collaborations with other departments inside the MIUN (for example, biology) and (b) through collaborations with other universities and international experts in relevant areas.

In addition to using their lab to examine sport applications (esp. winter sports), they will need to enable its use to examine the **scientific problems that underpin** sport (e.g., human efficiency or human movement in stressed environments such as winter climate, elite performance, high injury-risk activities). This more scientific

focus could complement the applied research and translation activities of SWRSC, allowing the center to develop a more coherent and comprehensive research agenda that builds on convergence of ideas across the research continuum rather than being spread across new applied topic areas.

2. SWSRC has to identify and promote their **originality and main contribution** in the international scientific community (e.g., studying complex movements and their application in challenging environments).

In terms of the **application of their research**, they are world leaders in winter sports. They must be careful to not dilute this position by incorporating a range of other sports (i.e., becoming a general sport sciences center). The research agenda could be expanded to include additional **outdoor** sports or to other aspects of winter sports, such as health and injury prevention or leisure/tourism. However, it is necessary to maintain the more narrow focus of expertise to remain competitive and sustainable.

3. They have to **improve their data treatment and data analysis** methods, which may require some new collaborations with departments within the university (e.g., mathematical lab, signal processing).

Other issues: connections with Sports Sciences department:

We would like to take advantage of this section for describing our difficulties in understanding the “separation” between the SWSRC center and the Faculty of Sport Science.

At first, our initial difficulty was related to the fact that among the three full professors declared as present in the self-assessment that we received, we had the opportunity to speak just with one: Professor Holmberg. When we arrived, we were told that professor Tesch was not part of the university anymore.

Having said that, we realized that the presentation of the two assessments (one for the SWSRC center and one for the Faculty of Sport Science) were highly redundant and they almost entirely overlapped.

Importantly, the highly exceptional role played by professor Holmberg immediately appeared clear in different aspects: rate of publication, search for founding, and responsibility as leader.

The first issue we needed to understand better was the specific role-played by the SWSRC center and the Department of Sport Science. It appeared that the two institutions needed a better connection in terms of combining the specification of their individual scientific responsibility and leadership in a coherent way.

It appeared important to define both in which way the two institutions need to collaborate but also to define where they need to act independently.

What is clear though is that in maintaining a formal division between the winter

sport center and the Department of Sport Science may be useful for encouraging a more dynamic organization and management of the resources available and for a more direct connection with external agents.

UoA 2.2 Sport Science
Faculty of Human Sciences

Experts: Prof. Annie Rouard, Prof. Paola Cesari, Manager Petra Dannapfel,
Prof. Elizabeth Kendall, Dr. Laurie Lachance and Dr. Tony Ryan.

General assessment

Grade: Good

The Sport Science group is focused on sport physiology and sport biomechanics. Their strength is in the combination of indoor laboratory data collection and analysis with outdoor data collection and analysis within the ecological context. The combination of **data and analysis from physiology and biomechanics is highly innovative.**

There is a new stream of research emerging within the group on the effects of physical activity and training on individual health, but at present this remains under development.

Even though the group is relatively small (2 full professor and 1 associate professor), **the level and quality of scientific output is good and in one case very good.**

The sport science group is seeking greater integration between the Swedish Winter Sports Research Center (SWSRC) and the department. This integration will help to establish new academic positions for the group and opportunities to recruit new senior staff.

This integration will also provide the opportunity to direct the scientific agenda toward new avenues, such as **health and sport exercise for normal population, disability and aging.**

One of the major difficulties the Department of Sport Science is facing right now is the lack of a stable (resident) group of staff members. To compensate for their small staffing base, the group has developed numerous international connections. Through these connections, many of which are reflected in 20% appointments, the group members are able to produce a large number of scientific publications. This strategy is a strength, but is not necessarily sustainable.

A major problem is the lack of PhD students, which prevents the group from developing a strong identity around the world. This situation is paradoxical given that the SWSRC is recognized at the international level for its expertise and attracts PhD candidates from many countries. Moreover, and more importantly, the lack of a PhD school prevents the sharing of unique knowledge developed within the group and also prevents the growth of a local repository of highly specialized individuals who may **pursue the mission of the group in future.**

The plausible future development of this faculty relies heavily on the effort devoted to creating **a new competent generation of scientists in this field of research.**

Quality of research

Grade: Very good

If we consider the scientific production of Sports Science as a separate entity from that of the SWSRC, the situation is very critical. The group consists of 3 full professors and 1 associate professor. Among the three, only one is resident in the department and consistently active from 2007 (i.e., Prof. Holmberg). During this period, **Prof. Holmberg** was the Director of the SWSRC and Director of Research for the group. He has only recently relinquished his position as Centre Director, being replaced by a less experienced and junior researcher with a high teaching workload.

Due to the overlap between SWSRC and Sport Science, it was difficult to disentangle the productivity of each unit. As a result, the panel decided to take into consideration the scientific production obtained in both SWSRC and the Department of Sport Science.

By considering the SWSRC and Sport Science together there is no doubt that **the quality of research is good.** The IF is in the mean adequate to their field of research, the group is publishing in middle and high ranked journals in the sport science domain.

One limitation, that can also be viewed as strength, is that the group's output has been **highly focused on winter sports.** Nevertheless, it is interesting to note that the group has recently re-directed its scientific interest towards other fields of research. These interests include different sports (e.g. soccer, downhill skiing), the link between health and physical activity (e.g. orienteering, cycling and walking, diet and exercise) and sport technology (e.g. testing sport materials, sport networking for both elite athletes and amateurs).

The research quality is also very good in the methodological sense: in particular, they have demonstrated strength in analyzing and combining data **from the laboratory to the outdoor field.** In addition, **they are well recognized at an international level** for their methodological expertise, links to applied contexts and laboratory facilities.

However, the group should develop **more basic science** along with the applied science that is already well developed. The panel would encourage the group to formulate more **fundamental questions** based on the **control of movement** to develop a better understanding of the **learning process in action performance.** This type of research would be well supported by the laboratory and applied setting and will represent a driving force for new insights through a better understanding of the related underlying psychological and physiological mechanisms for sport performance. The group is already sensitive to this issue and has the capacity and expertise to combine different fields of research, including measurements and

experimental protocols from physiology, biomechanics and psychology. Through these connections, the group will be able to ask and search for more fundamental questions in the field of movement science, resulting in more chances **to interact with the broader scientific community.**

Productivity

Grade: Very good

The productivity of the group has been constantly increasing from 2007. **In general the productivity is very good**, but this largely relates to the SWSRC.

The impact factor of the publications is high considering the specific field of research: The average IF is 2.5 and the number of publications since 2007 is 95.

The group is highly motivated and working hard such that is reasonable to expect that productivity will continue to increase.

However, much of the productivity is due to the extensive and constant presence of visiting professors and researchers invited from abroad.

These professors have only a very small percentage appointment within the Mid Sweden University, so the extent to which they contribute to the long-term stability of the sport science group remains unclear. Although they reported high levels of commitment to the SWSRC and respect for the group, their involvement focused on personal relationships with Prof. Holmberg and the need to access the facilities that are only available in this location.

This situation could be a risk for the future of the group as the appointments are developed on a personal basis and in particular due to the broad international connections that Prof. Holmberg was able to establish.

Research environment and infrastructure

Grade: Very good

The apparatus present in the several laboratories within the center are highly developed, well situated, efficient and appropriate for the research need. **It is important to mention that all the laboratories are located in the SWSRC, but are available to the remainder of Sports Science.** The extent to which the facilities will be available to those beyond the SWSRC needs to be ensured.

Research networks and collaborations

Grade: Very good

The research network is highly developed in this group, which represents a main strength and explains their prolific productivity despite their small number of residential staff.

Their **laboratories** and the specific fields of **research in winter sport** (especially cross-country skiing) are **very attractive for foreign researchers.**

The group has an interesting **vision for their future** development.

Two new fields of research have already begun to develop.

- A. They are ready to be connected with the tourism department with an interesting project to be performed in combination with a visiting professor who has a 20% appointment within the Mid Sweden University.
- B. New research is being established in the area of physical activity for the general population concentrating in walking, cycling and commuting within a rural and non-rural environment.

Coproduction and external non-academic cooperation

Grade: Good

The group has developed a very strong collaboration with national and international sporting federations (in particular winter sport). They share their results and knowledge with a range of people involved in sport (athletes, technicians, sport directors and managers).

They are currently developing **new sport technology** (e.g. by using phone technology). In this area, they are already connected with people in the field and are sought after for their expertise. They are qualified in testing different sport materials and equipment and have the necessary facilities to expand this activity in future. They have the capacity to develop contracts and collaborations with local and national companies.

Impact on society

Grade: Very good

1. Strong collaborations with the sport federations
2. Share of knowledge with athletes and the technical staff from different sport disciplines
3. Collaboration with the local municipality for instance for the organization of international sport events
4. Collaboration and contracts with local companies
5. Good visibility

Strategies and plans for development and renewal
in the Unit of Assessment

Grade: Good

They have a vision for their department and have already developed a strategy:

1. To have a stronger connection combining the SWSRC with the Department of Sport Science

2. Develop sport technology (new sport materials, networks, phone technology) to service elite athletes but also the general population
3. Open a new avenue for applying their knowledge and expertise to the field of tourism.

They are well aware of their limitations and challenges, which is rare.

Recommendations for development

1. Strengthen the PhD program
2. Develop spin off companies/contracts and where possible patents
3. It is urgent to have more stable professor positions (100% Miun)
4. Co-financing between Miun and companies for founding high-level education (PhD and postdoc positions and to buy lecturers' time for research).
5. Explore the Erasmus Mundi program (they have already great connections with different laboratories around Europe, shouldn't be so difficult for them to organize an international PhD program)
6. Explore the Erasmus and Socrates program (same comment as above)
7. Attract EU grants (same comment as above)
8. An ad hoc office for grants is necessary. This will help the group tremendously to be ready and well equipped for writing applications.

Other issues

See the general comments we made in the other report

Grading scale

Grades	Quality	Productivity	Infrastructure	Collaborations	Coproduction	Impact	Renewal
Excellent							
Very good	X	X	X	X		X	
Good					X		X
Insufficient							

UoA 2.3 Public Health Faculty of Human Sciences

Experts: Prof. Annie Rouard, Prof. Paola Cesari, Manager Petra Dannapfel,
Prof. Elizabeth Kendall, Dr. Laurie Lachance and Dr. Tony Ryan.

General assessment

The Department of Public Health has evidence of strong research based on the quantity and reach of publications and numbers of PhD students. The research group in Public Health is relatively small; however, there is evidence of strong involvement and motivation within the department work. Currently, there is much transition in this department due to the Emeritus status of one professor, and imminent retirement of those with the bulk of the publications and projects, and also the very recent addition of one associate and one new full professor. The vision for the current and future focus of the department has not been articulated in the self report, and it is not clear who will be in a position to take on the role of department head in the next phase. Possibilities for collaboration within the university exist, especially with Rehabilitation Science and Sports Science. It is also possible, given current research interests of researchers, to develop a scope of work that is connected to the local community.

Quality of research

Grade: Good

National and international recognition exists for individual work within the department; however, there is **no cohesive identity for the department itself**. This aspect is difficult to evaluate due to the fact that the department is relatively new, with few at the professor and associate professor rank, and at least one at very early stages at Miun.

External funding has been problematic for this department, with a report of **5 recently submitted grant proposals resulting in zero funding**. The unit reports that the academic scores for the research are strong, but that the proposals cannot compete with those from other academic institutions such as Karolinska Institute, Uppsala, and others. This lack of funding for submitted proposals needs further examination to determine issues related to their rejection (e.g. the scope of intended research, the perception of Miun in terms of research capacity).

Further development is needed in relation to overall focus for future funding areas and sources, which should include a broader arena of funding sources, and maybe collaboration with other research groups to increase chances for funding and overall research activity. **It would be helpful to conduct meetings and workshops to create focus and vision at the department level.**

Productivity

Grade: Good

Individual faculty members have demonstrated productivity in peer-reviewed publications related to pain, violence, mental health, cardiovascular disease, cancer, stress, and child poverty. With a total number of 150 at the professor and associate professor rank (2 associate professors recently promoted to full professor) and 100 from the professor emeritus rank (1 professor).

According to the self-assessment, the department has been involved in 16 peer-reviewed publications in 2013. It appears that most publications are associated with the work of Professor Soares (40%). Of the selected peer review publications included in the self report (n=37), 2 were published in 2013, 14 in 2012, 8 in 2011, and 13 in or before 2010. Many publications are in international journals, and most have moderately high impact factors (>2.0).

Collaborations are strong with international colleagues, most particularly with Professor Soares and an adjunct senior lecturer (Reza Mohammadi). There is a risk that some of these collaborations will be lost when Professor Soares retires, if there is no mechanism/strategy for continuing these partnerships with another professor in the group or new recruitment.

This department currently has an above average number of PhD students. Between 2010 and 2012 the department has supported **11 PhD students**, and currently has 2 theses in line for defense before the end of 2013. **Most of the PhD students are from countries outside of Sweden (e.g. Africa, Iran, Bangladesh), and most are financially supported by their countries.** Although the UoA reports that they have many requests from students who would like to do their PhD work in this department, it is difficult to mentor these students given that there are no professors at the associate rank and three full professors, one of which is set to retire and another one who has a substantial appointment at another university.

There are currently **no post-doctoral positions** in the department. Three full time senior lecturers and an adjunct senior lecturer are employed, but **due to teaching requirements, it is difficult for them to develop a research program.** One emeritus professor is actively participating in teaching and research, but can only tutor one student.

The UoA reports that they would like to do more to move their doctoral students forward in research scholarship and promote them to professorial rank, but this is difficult due to the lack of funding, the upcoming retirement of the department head (Soares), and the need for a more solid structure of mentorship.

Research environment and infrastructure

Grade: Insufficient

Present research activities and publication efforts are impressive among individual faculty members, but there is not much cohesiveness among the various efforts.

This is most likely related to the low numbers of professors with dedicated time to perform research. The lack of a common vision for research and strategies for profiling within the department makes it difficult to **determine a public health identity for the work.**

The reorganization within the department that was performed in April 2013 has the **potential to open up new collaborations** with other internal research groups. Collaborations are needed within Miun University to recruit additional permanent researchers. PhD and postdoctoral positions are not sufficient to develop sustainability in the team, and it would be beneficial to identify the possible collaborations (sociology, psychology, sports, rehabilitation, nursing sciences). The group has PhD students from other countries, one who is the link to successful research conducted in the area of cardiovascular diseases with Iran. Due to the high amount of foreign PhD students, skills and research conducted at Miun within this field are recognized in corresponding nations.

Collaboration and closeness to other researchers might create a positive learning environment and increase the feeling of belonging and also a positive research climate. This can also open up opportunities to share teaching responsibilities and other creative strategies which may provide protected time for research given the scarcity of funding and time resources at the University level.

The panel experienced that the group does not have a clear identity and does not have a clear understanding of their role in the University and, also that the strategy for the research field of Public Health is unclear from the management at the University. This will have an impact on the group and might make it difficult to formulate their own strategies for the future.

The Masters program in Public Health is offered as distance training. This is a weakness since there is no face to face interaction with students. Participating in a Master program on the campus may not only be a way to recruit PhD students, but also be **a way to integrate and bridge the Master program as part of society.** The Master students would benefit from the opportunity to perform their thesis within i.e. the county council, municipality etc. This would benefit both parties since there would be an exchange of knowledge and a bridge between theory and practice.

Research networks and collaboration

Grade: Very good

Collaborations at the national and international levels exist, however, and most of these collaborations and networks are related to the work of the current department head, who is set to retire. The group is involved in European projects that collect large

amounts of data, and there is also access to large datasets from previous studies. In the research fields of chronic pain and psychosocial factors related to health, the group has an established collaboration with Stockholm University and the County Council of Stockholm. This research could expand to include the County Council of Jämtland. **Collaboration with local actors exists; however increasing, these relationships could be beneficial both for research funding and also for involvement in projects that have the potential for research.**

Coproduction and external non-academic cooperation

Grade: Good

Relevant collaboration is occurring within the department between core staff. This collaboration extends to PhD students. **Efforts toward development of research capacity and career building with PhD students are visible and commendable.** Collaboration could be developed with external partners. Research that extends to the **surrounding community** could be targeted, with the potential to **translate research** into policies and practices that improve health, particularly with vulnerable populations.

Impact on society

Grade: Good

The significance of the research to society is good, but given that public health is concerned with societal well-being, efforts that maximize the opportunity to benefit society could be further developed. Several of the studies performed by the group have the potential to become interventions that can improve different areas in society. The DISA method is one example of this and research that can increase knowledge about how to prevent depressive symptoms among adolescent girls and interventions that can impact and improve the situation are needed.

Collaboration with non-academic partners is not clear. It is important to both develop and strengthen non-academic partnerships, including organizations, agencies, and individuals at the community and regional levels. There is some collaboration and successful integration between the group and society, i.e., promotion of healthy lifestyles. The group would benefit from disseminating their research results more widely, **emphasizing their usefulness for the population to increase health**, well-being or more efficient ways of working with issues in Public Health. The research area of mental health among school children has a potential for future collaboration with the Agency for Special education here, and also the municipality might be interested in participation and further for the implementation of the **Photovoice method**, which has also resulted in a 7.5 credit course.

The research projects ABUEL, PROMO and EUGATE have, according to the self-assessment, included activities to spread the knowledge from these projects.

However, several of these dissemination strategies can be seen as **relatively passive**. Strategies and plans for development and renewal in the UoA are insufficient.

The current university reorganization provides a good opportunity for this team to develop and increase closer collaborations with other research teams of the university and with the County Council. Given the timing of faculty arriving and leaving, clear efforts should be made to develop a common vision for the department that extends beyond individual research. At present, there are overlapping areas at the Faculty. **Public health is a broad and inter-disciplinary field**. What will be the focus and the most important areas of contribution from this department at the local level, within Sweden, and internationally?

Recommendations for development:

1. Create strategic community developed pilot projects that have the potential to increase in scale, attract funding from multiple sources, and provide opportunities for PhD students to conduct research. Reach out to the community to define and address local public health issues with both research and practice.
2. Recruit a core faculty with the potential to mentor PhD students and contribute to a research agenda.
3. Create a focus for the work that is in line with Miun vision and goals.
4. Continue to create opportunities to attract and support PhD students with the potential to advance through the ranks within the department.
5. Use the SOCRATES or other international programs to send PhD students to other countries and to receive others.
6. Increase the relationship between teaching and research.

Other issues

Expectations for departments related to research are not clear at the university level in terms of:

- physical time spent on site
- numbers of publications expected per year
- amount of external funding expected

Do annual merit reviews take place that provide incentives and feedback to researchers related to their work, and provide opportunities for individuals and departments to set and revise goals?

There appears to be underdeveloped central support at the university level for both content and administrative-related support for external funding.

Grades

Grades	Quality	Productivity	Infrastructure	Collaborations	Coproduction	Impact	Renewal
Excellent							
Very good				X		X	
Good	X	X			X		X
Insufficient			X				

UoA 2.4 Nursing Sciences
Faculty of Human Sciences

Experts: Prof. Annie Rouard, Prof. Paola Cesari, Manager Petra Dannapfel,
Prof. Elizabeth Kendall, Dr. Laurie Lachance and Dr. Tony Ryan.

General assessment

Research production within the Department is centred around four key themes: Reproductive Health-Childhood and Youth, Mental health nursing, Older people nursing care and Medical and surgical nursing care.

Whilst these appear internally coherent, some concerns exist in the low level of interaction across these themes. **A major central concern is the need for the department to capacity build.** Several senior research active staff is approaching retirement age. There is insufficient evidence to suggest that more junior staff, including Associate Professors, are carrying out high quality research and producing outputs at an appropriate level. The department needs to consider ways in which those members of the team can become actively engaged in appropriate research activities to help them to develop research leadership competencies.

The panel was impressed with the quality and impact of contributions made by a number of established/senior members of the academic team, especially when this is considered in the context of nursing as a discipline. The panel would also wish to note that this activity was considered to be **impressive in the light of the extensive educational activities also being conducted** by the department across multiple sites.

Extensive collaborations and co-production are noted for one or two individuals within the department, but the internationalisation of networks is of concern to the panel and indeed the departmental leadership.

Whilst the department has benefited from moderate grant capture successes in the past this has declined in recent years and is of concern to both the departmental academic representatives as well as to the expert panel. A clear strategy aimed at maximising grant capture is required.

Quality of Research

Grade: Very Good

An assessment of the quality of research should include reference to international and national visibility, clarity of research aims and methodological competence.

The department employs a range of methodological approaches to address important questions which relate to both nursing practice and policy. Each of the themes is considered below.

Reproductive Health-Childhood and Youth is centred on research conducted by two teams, as such the theme does not represent a coherent body of work. Nevertheless,

the quality of research and subsequent outputs are relatively impressive, utilising large scale cohort studies, meta-analysis and secondary analysis of epidemiological studies. Hildingsson's work in the field of Caesarean section and home birth expectation has resulted in a number of peer reviewed papers, including one contribution in the journal *Birth* (IP=2.9). This work is aimed at establishing the level of participation women experience in the birth process and as such is significant in both policy and professional practice terms. This work is reported in a number of publications, all with **international visibility**. These studies based on large sample cohort and case note review studies in collaboration with academics from other Swedish universities and is the outcome of major grant funding held by Hildingsson (Swedish Research Council 4 485 000 SEK). Sellstrom's work in the field of social capital and housing for school children has resulted in the co-authorship of one Cochrane review; other work also appears in journals with impact factors above the median for the discipline and maintains high international visibility. Again, this is also the product of mainstream national funding for which Sellstrom is a grant holder (FAS 1 500 000).

Those working within the field of 'Older people and nursing care' have also published within peer reviewed journals with impact factors above the median for the discipline. The work within this theme can be regarded as important given the changing demographic structure of developed countries and the implications that this has for nursing practice. Hellzen's work addressing inner strength and older people with chronic illness and Melin-Johansson & Danielson's work around dementia caregivers have both been published in the *Journal Aging & Mental Health* (IP=1.97). Other work in this theme has been published within journals with more modest impact factors. Work in the field of caregiving following chronic illness for older people is also of interest and conceptually challenging. The research uses notions of existentialism, self and loss to characterise the caregiving experience. The methodological expertise that has been developed, especially in relation to content analysis, **is noted as a particular strength of this theme of work**.

The trend to publish within journals with an impact factor above the median for the discipline, including journals outside of the immediate field of nursing practice, was also noted with the mental health theme. Kristiansen & Hellzen's contribution to work on long term psychiatric care has been published in *Qualitative Health Research* (IP=2.18). This particular study is centred on the intersection of nurse experience on a changing policy and practice context and is **novel to the literature**. This theme is also experienced in the use of large scale cross-sectional research.

The Medical & Surgical Care theme is also represented in relatively high ranking journals. Danielson's contribution to the field of palliative care for people with cancer is revealed in several articles which feature in journals with relatively high impact factors. These include the *Journal of Pain & Symptom Management* (IP=3.14) and the *Journal of Advanced Nursing* (IP= 1.52). This work is innovative in its attempt

to identify existential threats for people with cancer at the point of transition to palliative and supportive care. **The work is also methodologically challenging and innovative, utilising skilled research practitioners.** Furthermore, Asplund has also published within this theme in *Qualitative Health Research* (IP=2.18).

The self assessment document cites a number of more recent projects, including a Europe-wide project focusing on physical activity and severe mental illness (LIFEHOPE). Other current research projects, not cited within the self assessment document, include innovative work in the field of tele-health care and community based dementia provision. Both of these projects can be viewed as important areas of activity given their novel status and importance in relation to health care policy and practice. The tele-health care project also employs an action research methodology, providing further evidence of competence in a number of fieldwork areas.

Productivity

Grade: Good

Total number of publications during the period is 154. The mean impact factor for the period is 1.27 (median for the discipline is 0.9).

The panel was impressed with the outputs of a number of senior staff. When viewed relative to the discipline as a whole, nursing staff members at Miun have performed well in recent years. The panel noted, however, that these outputs are dependent on a small number of staff. The panel also noted the considerable efforts and achievement made over a sustained period by these key people.

It is the observation of the evaluation team, however, that **the level of productivity is not commensurate with the staffing resources available.** Furthermore, the productivity of a small group of active researchers (Hildingsson, Danielson, Asplund, Axelsson, Sellstrom & Hellzen) is responsible for a large proportion of the existing output. One significant confounding factor, discussed with the team, was the ongoing departmental commitment to the large undergraduate nursing degree and the fact that this has to be delivered on multiple sites. It was recognised that there is also a considerable administrative burden associated with such provision. Senior Lecturers in particular, it was noted, carry a large teaching burden with little time to devote to writing for publication or grant capture.

Research Environment & Infrastructure

Grade: Insufficient

The Department's staffing profile would indicate a relatively rich level of resources available for the conduct of high quality research. The department boasts four FTE Professors, five FTE Associate Professors and 14 Senior Lecturers. In addition, the department indicates a number of other junior lecturer staff. It has already been noted here that the burden associated with the administration of a large training

programme is problematic when attempting to sustain a coherent research programme.

The recent organisational changes appear to have **isolated the department from wider multidisciplinary research seminars** previously held with the Departments of Public Health, Criminology, Sports Science and Rehabilitation. Some links with medicine exist within the Department in the form of the presence of Professor Axelsson. Prof. Axelsson's work is to be commended and is of a high quality. The isolation of the Department, however, from other disciplines was considered by the panel to be detrimental to the research environment, particularly in light of the need for high quality nursing research to utilise a range of perspectives and methodological approaches. The panel also felt that the leadership's determination to pursue a uni-disciplinary approach to both research and education is potentially harmful to research development.

The panel could not see any evidence that staff in the department benefit from an appropriate level of support and infrastructure, at any level, which might assist them in achieving grant capture or maximising outputs.

The panel was able to identify additional mechanisms for the enhancement of a research culture like the recently developed grant proposal writing workshops. It was noted that this kind of initiative has the potential to impact upon research capacity within the junior/novice staff team.

The department has a relatively vibrant PhD programme. Eighteen Doctoral theses have been successful in completing their PhD studies between 2007 and the time when the self-assessment report was concluded. There are currently 11 doctoral students registered within the department. Two PhD students attended the panel meeting and spoke highly of their experiences and supervision. Further development of joint PhD programme with the University of Gothenburg is further evidence of a commitment to doctoral training within a collaborative context.

Networks & Collaboration

Grade: Good

Those international networks cited within the self-assessment document were largely associated with one individual (Hildingsson). Notwithstanding this limitation, it should be noted that this **one member of staff maintains an extensive international network** which shows evidence of intensity over the long term. Hildingsson maintains what appear to be excellent links with a number of international colleagues in institutions in Australia, USA and other Scandinavian countries.

A particular issue relates to the lack of English-speaking skills within the current PhD cohort. This places these students at a distinct disadvantage when they come to build their own international collaborations. It was noted during the site visit that there was a **strong wish to extend international collaboration to a wider number of staff**, including doctoral students within the department, and that they regarded

this issue as one of the challenges facing the team. The panel was unable, however, to see evidence of a strategy to address this issue.

Hellzen has also spent a considerable length of time conducting fieldwork in Norway. The department has links with other **Norwegian universities** via the Centre of care Research Mid Norway. During the site visit others reported links with European networks on palliative care and collaboration with the UK medical researchers. International collaboration was viewed as being weak by the department, both within the self-assessment document and during the site visit.

There is evidence to suggest that the department engages in collaborative work with the County Council, although the focus of these activities appears to be largely associated with education. There is evidence of some collaboration with clinical staff undertaking their own research within the municipalities, with these activities being supported by departmental staff.

Coproduction and external collaboration

Grade: Insufficient

Coproduction and external collaboration for research is limited despite very good links with such agencies via educational provision. Funding can be used as an indicator of such success and this has been restricted to the work of Melin-Johansson and Danielson who have received funding from Cancer Foundation, Northern Sweden to support the development of an applied intervention study on assisting nurses who work with cancer patients at the end of life.

Coproduction with service users, carers or patients was not cited in the self-assessment documents, neither was it raised as a significant aspect of the departmental activity during the site visit. This is an area for development.

Impact

Grade: Very good

Several **very good examples of the impact** of the department's research and expertise were highlighted to the panel, via both self-assessment and the site visit. Members of the academic team reported significant leadership roles in relation to the development of guidelines within the field of dementia care in Sweden (Member of the Swedish Council on Technology Assessment in Health Care (SBU) Expert group Dementia (Asplund), alongside expert membership of other national groups in the field of nursing science. Others also noted a membership in professional policy making bodies at a national level (Member of an expert group for national guidelines for caring for persons with schizophrenia - 1999. SBU; The Swedish Council on Technology Assessment in Health Care and SSF – Swedish Society of Nursing) (Hellzen). Impact at a local level include innovative dementia care service models and work on the health of school children in the county.

Strategies and plans for the development of the unit

Grade: Insufficient

The panel is concerned that whilst the department has performed well relative to similar sized nursing units in terms of research quality, productivity across the team is not being sustained, particularly at the Senior Lecturer level. Furthermore, the panel considers that some of the senior, more productive, academics are likely to be facing retirement age in the near future. These two factors mean that **renewal is centrally important if the department is to continue to perform in the medium to longer term**. The department has a vibrant PhD programme and is seeking to extend this with plans for cross-Nordic doctoral study collaboration. The panel agrees that this provides the potential for growth at this level.

It has already been noted that a small number of academic leaders conduct their work within extensive international networks and that this is beneficial to the department. There is limited evidence, however, that these individuals collaborate with staff within the department, meaning that **limited time is given over to the nurture and mentoring** of Associate Professors and Senior Lecturers.

The panel expressed concern that **excessive teaching at Senior Lecturer level** has hampered research activity for these staff. One creative approach employed by the department to help to overcome this problem is to provide funding (30 per cent) to seven of this group of staff in order for them to be involved in research activity (writing, grant proposal development). This way, some of these Senior Lecturers perform a similar role to the Postdocs observed in other departments and this was seen as a strength. However, an overall strategy aimed at growing these staff members and preparing them for future research leadership is not clearly apparent.

Recommendations

1. An **appropriate appraisal and or developmental mechanism** needs to be put in place to ensure that staff at Associate Professor and below are assisted to develop relevant skills to become the nursing research leaders of the future.
2. The department needs to develop a coherent and **realistic internationalisation strategy** to enable greater spread and consistency of international collaboration and coproduction across the team.
3. The department should consider using its **privileged relationship with local partners** as a means for establishing coproduction activities in the field of research as well as education.
4. Those research leaders who devote a great deal of time to the development and maintenance of international networks should **also continue to ensure**

that they consider ways in which these networks can benefit the research leaders of the future.

5. Whilst the panel understands the motivation and rationale for the uni-disciplinary approach and stance that it has recently taken, it would also wish to note the potential for this decision to isolate staff and students. The panel feels that **every opportunity should be taken to collaborate with members of the wider university community** and utilise the broad range of disciplines and perspectives available.
6. The department should take the opportunity to **utilise the vast skills, experience and knowledge of senior staff** in order to enhance the research capacity of the whole department.

UoA 2.5 Rehabilitation Science
Faculty of Human Sciences

Experts: Prof. Annie Rouard, Prof. Paola Cesari, Manager Petra Dannapfel,
Prof. Elizabeth Kendall, Dr. Laurie Lachance and Dr. Tony Ryan.

General assessment

This UoA focuses on vocational rehabilitation and health in working life. It brings together multiple disciplines and mixed methods to address complex research questions about how work and life intersect to produce outcomes for individuals and society.

Despite its relatively small number of research staff, the unit focuses on four large and complicated themes of research (vocational rehabilitation, marginalization and health in work, health promoting workplaces and division of labor/work-family balance). Within each area, there are multiple streams. For example, vocational rehabilitation focuses on models and methods or processes of rehabilitation including case management and cooperative practices, self-help and positive engagement. These are vastly different areas with different methods and audiences. Within the labor market area, there is focus on unemployment, gender and disability. Within health promoting workplaces, there is focus on determinants of employee health, health promotion practices at work, leadership for health and the context of self-employment or small to medium enterprises. The Division of Labor area is more coherent than the other areas, with a clear focus on work/family conflict across gender and in a range of contexts (i.e., organizations, self-employed etc.).

The panel was recognized by the productivity of the group in terms of grant success, industry linkages and the research/teaching nexus. Specific strengths noted by the panel included:

The panel was concerned by the limited sustainability of the group in terms of future growth through PhD students and research support to maintain the productivity of the existing researchers. Specifically, weaknesses included:

Overall, the group was viewed as having significant potential to grow and become even more productive in the future. Social structures are in place to support their growth (e.g., a previous Centre structure, strong collaborations internally and external linkages). They have already been engaged in discussions of this nature. More importantly, the group represented an important mechanism through which to articulate the university goals. Specific areas of opportunity included:

Quality of Research

Grade: Good (with potential to shift to very good in the near future)

Collectively, the research themes are sensible and comprehensive. They are connected through the central concept of well-being/health at the work-life interface and share a focus on marginalized groups across different contexts of employment/unemployment. However, the unit would benefit by further exploring the unique identity of the collective, finding its real strengths and describing them more fully yet succinctly rather than being overly inclusive. One project does not constitute a thematic area of programmatic research. At present, the small group appears to be stretched too far to sustain productivity across all these areas and some thematic parsimony is needed.

This review of research themes will raise some difficult challenges for the group in terms of whether they focus more narrowly on vocational rehabilitation or whether they encompass a broader definition of rehabilitation. Similarly, there will be decisions about whether or not to focus on narrow models of rehabilitation or the broader continuum from acute to community. Although large research centers focused on work and health are relatively common, there are fewer academic centers focused on vocational rehabilitation, making this a potentially unique area of expertise within Sweden, but also internationally.

In terms of methodology, the group brings a good mix of qualitative and quantitative methods, with a stronger focus on sociological methods but reasonable capacity for quantitative analysis skills.

The research area, particularly the vocational rehabilitation component and to some extent, workplace health promotion, is one that does not have a long tradition of scientific publication and higher degrees, making the progress of the group within a short period of time even more impressive. As a practice-based discipline, vocational rehabilitation and workplace health promotion have traditionally placed a greater focus on education/training and application/translation than on scientific endeavor. Despite this tradition, the group has published at a consistent rate across the last five years.

The group has developed new models of vocational rehabilitation that are nationally recognized and address important challenges faced internationally (e.g., case management models). Consequently, this research (and other similar research conducted by the group) has the capacity to become internationally recognized and adopted.

The group has attracted large grants from competitive sources such as the Swedish Council for Working Life and Social Research and the 7th Framework programme. Most importantly, they have obtained Swedish Research Council funding, which indicates excellence in research.

The amount of funding received by the group declined slightly in 2011-2012, probably reflecting the generally tighter economic conditions. However, the group

has strategically maintained a diverse funding profile that includes competitive schemes, foundations and public/private bodies. This funding profile also indicates that the research is highly valued and recognized by both academic peers and end-users/research collaborators.

Productivity

Grade: Very good

The unit is a relatively small group of researchers with two professors, two associate professors (one 20% only and residing in Norway), 5 lecturers who are predominantly teaching staff (some without a PhD), and some visiting, adjunct and emeritus staff. Thus, there are 8-9 individuals in the group, but a much smaller number (about half) have the capacity to be research-active. An opportunity exists to recruit another senior staff member to replace a recently vacated position.

During the assessment period, the group has published approximately 40 papers (an average of nearly 7 per year). As would be expected in this area, the publication profile contains a high number of book chapters and books (n=14) as well as conference presentations and industry reports (n=10). Although one senior professor (Nordenmark) is highly productive, publication outputs are spread across the senior staff and some junior staff. Given the percentage of FTE allocations to research among the staff in this group, the rate of publication output is reasonable. The group may benefit from implementing method that foster writing productivity, such as collaborations, writing retreats, mentoring.

PhD recruitment and completion is an area in need of attention by the group. Only 4 PhD students were present in the group, although two were about to submit or had already submitted. With four eligible supervisors and four associated emeritus or adjunct professors, there should be a greater presence of PhD students in the group. Further, the group has access to a strong pool of Master's students and undergraduate students, many of whom wish to pursue post-graduate research careers. The lack of PhD scholarships is the most limiting factor, so the group should explore creative ways of co-financing positions. This may be possible given the strong links with industry.

However, the level of output could be slightly higher (i.e., more publications per member) and more impactful (i.e., journals that are more likely to be cited). For instance, the group has relied on a relatively small number of journals, some of which are new or have no impact factor. Although these journals have practical value to the industry (i.e., are read by practitioners), the research of the group could be successfully published in higher quality journals. It is important to note, however, that the group has published in the most useful and best journals in their specific area (e.g., Disability and Rehabilitation IF= 1.54; International Journal of Rehabilitation Research IF=1.08; Ageing and Society IF=1.15).

To place the quality of their output in context, benchmarks for this discipline area

are usually relatively low and journal impact factors rarely exceed 2. Citation rates in this field are also low and tend to grow over long periods of time, limiting the likelihood of strong scientific impact in the short-term.

Relative to the research resources of the unit, productivity is very good. However, the unit could be more productive in terms of high impact articles and PhD enrolments. There is a natural focus on books and chapters, but some of these outputs have been used in other university courses, indicating high quality.

Research Environment and Infrastructure

Grade: Very good

The experience of the senior researcher (Nordenmark) is a significant asset to the group, particularly in terms of links with competitive granting bodies and strategies for success. It seems that his experience and productivity has translated into success in competitive grants for other members of staff, as indicated by the recent grant successes by Vinberg, Landstad and Selander. The enthusiasm of these staff members is matched by Nordenmark's collaborative leadership style, resulting in these funding successes. The group should, however, identify others who can be called upon to build capacity, particularly emeritus/adjunct professors and internal as well as international collaborators. This will reduce the reliance on a single senior researcher.

There are no research assistants in the group, which was surprising given the number of funding grants that had been attracted. The group may need to look for creative ways of using existing funds to support infrastructure that can facilitate further research productivity. For instance, shared administrative assistance to manage grants would assist this group to progress projects more quickly and productively. This strategy could become a shared departmental resource (i.e., Sport Science, Rehabilitation, Public Health). Another way of easing the burden for the researchers is to develop a program for amanuens (opportunities for talented undergraduates, post-graduates or practitioners to participate in research or teaching to build experience, but simultaneously assist research staff to be productive). Amanuens can be voluntary or reimbursed at a low rate so they are not costly to the group. Similarly, the group should consider creative ways of increasing the presence of PhD students and post-doctoral researchers in their unit. This presence would assist in building a research culture and a career path for PhD students, which is currently absent. Nevertheless, there is good will within the department that enables junior staff and PhD students to develop research capacity. This good will needs to be translated into more formal programs. To have exchange of both Masters and PhD students with other universities will increase their attractiveness and also facilitate knowledge-sharing.

The presence of strong industry and practitioner links are critical to the success of this group, but are time consuming to establish and maintain. This investment should be viewed as a long-term strategy to gain credibility and funding.

Research Networks and Collaboration

Grade: Very good (but need to expand and capitalize further on international collaborations)

The researchers have strong partnerships with government, employers and agencies, both nationally and internationally. Every major project or body of work is based on significant partnerships with other national universities, international research groups, private organizations or government agencies. It is not clear how these partnerships are being sustained and formalized to ensure that more researchers and students can capitalize on the collaborative environment.

Given this high level of collaboration, it is surprising to see a relatively low number of keynote presentations and invitations to engage with international events. There are no visiting researchers, which limits the development of a strong research culture and the need to present as a coherent group. There are a couple of adjunct researchers, but it is not clear how these positions contribute to the overall productivity of the group. However, there is a strong base from which to build this type of engagement as members are being requested to review grants, manuscripts and theses at a relatively high rate.

Internal collaborations within the university are more problematic in that the research of the unit is currently duplicated by public health, sport science, nursing science and other areas of the university. The new structure of the department, which has been in place since April, has yet to demonstrate any impact on the way in which the departments work. From the perspective of the group, the restructure will be a positive change that will raise opportunities for them to be less dominated by Nursing Science and more able to build collaborations with Public Health and Sports Science. Links with other departments, such as Psychology, Sociology, Social Work, Human Resources and Economics should be explored in the future.

Coproduction and External Cooperation

Grade: Very good (with potential to shift to excellent with greater attention to sustaining strategic partnerships)

There is strong motivation among government agencies to engage with this research agenda as it directly addresses an important social impact (i.e., labor shortages, work absences and productivity).

The researchers in the group were previously connected with the National Institute of Working Life, which was closed in July 2007. At the closure of NIWL, the European Network Education and Training in Occupational Safety and Health commended the performance of the institute and noted the value of its research. Research that is now conducted by this group within Miun is replacing the important public research and translation that used to be performed by NIWL and was highly valued by society.

Given that this group is deeply engaged with industry and the public, the group

is modest in capitalizing on benefits that can be returned to them, in a two-way collaboration. It should be possible to develop an advisory group consisting of industry partners who can promote the group and create avenues for growth by emphasizing the community value of the research and its translation.

Impact on Society

Grade: Very good

This unit has an extraordinary capacity to fulfill the university goal of becoming recognized for its capacity to be relevant to surrounding society while still producing high academic quality research.

There is an inherent focus on impact in the research of this unit, combined with a participatory approach to translation and implementation that appears to be built into each project. Their impact is further strengthened by the focus on actual practices, the interdisciplinary nature of their work and their integrated approach to education/training based on evidence.

However, they could strengthen their focus on giving early attention to strategies that support implementation of new interventions. A focus on implementation is an important aspect of this type of research as it can have an important impact on economic outcomes and well-being of individuals in society.

There is a balance to be reached between international impact and local relevance that translates into practice changes. The work of this group is highly relevant to the local policy context and system, but also has the capacity to influence more global agendas. This international impact has not yet been fully realized by the group, but with adequate attention, this impact could be achieved.

Strategies for Development and Renewal

Grade: Good (with potential to shift to very good with some time investment)

This group has the potential to grow due to the collegial atmosphere, strong leadership, energy, openness to change and respectful working environment. As a research group, this group can achieve multiple aims for the university if adequately supported, including attraction of students, other research groups, both nationally and internationally, industry linkages and academic productivity.

To achieve this outcome, the group will need to develop a clear facilitative structure, shared focus, coherent identity and a research culture. The group was innovative and forward-thinking, but had not yet devoted sufficient time to planning and creating a shared vision for the group.

Recommendations

- Build PhDs and post doc opportunities
- RAs and admin assistant
- Advisory Group to capitalize on industry linkages
- Seek opportunities to build industry funded positions
- Build on international linkages to support additional capacity, particularly Dublin, USA and Australia, which are the leading institutes in vocational rehabilitation.
- Better use of adjuncts and emeritus
- Linkages with other areas internally (within department and external to department) to enhance productivity
- Collaborate to produce high impact publications
- Revitalize Centre structure to support research
- Develop impact statements from all projects to highlight the translational outcomes.
- Identify specific areas of strength that connect with locality and distinguish the group from other research groups (i.e., rural context, marginalization issues)
- Explore ways of generating income through professional teaching opportunities, vocational rehabilitation services and marketing of tools/ models developed through research.



4.2.3 Research Field 3: Social Sciences

UoA 3.1 Risk and Crisis Research Centre (RCR)
Faculty of Human Sciences

Experts: Prof. Havidán Rodríguez, Prof. Jo Phoenix, Prof. David Farrell and Dr. Kjell Mo.

General assessment

The RCR is currently housed in the Faculty of Human Services and the Coordinator of this Unit of Assessment reports to the Dean of the Faculty. Although the RCR was formally established as a center in 2010, the sociology faculty has actively been pursuing research in the area of risk and crisis since 2003. It is important to note that the RCR was built and developed on a strong social (or sociological) research tradition although it has expanded to become a thriving interdisciplinary research center. The RCR provides an interdisciplinary focus on the study of risk and/or crises in relation to social issues and societal challenges. It is this focus that makes the RCR stand out as distinct from other traditional research hubs where the tendency is to adopt a psychological or technical perspective. RCR's self-assessment states that its main goal is to become an international center of excellence for societal risk and crisis research. The unit's research on risk is based on work within Criminology, Computer Science, Political Science, and (primarily) Sociology, among others, covering such topics as risk assessment; logistics and decision support; risk decision-making and trust; public understanding of risk; and risk power and governability. The center's research on crisis is based on work within Informatics, Law, Political Science, and (primarily) Sociology, among others, covering topics such as collaboration and management, disaster law, and the sociology of crisis. The center also has a broad collaboration with both local and regional actors in municipalities and cognate organizations in order to test and implement some of the research and develop the capabilities in Swedish society. The expert panel's overall impression is that the RCR plays a valuable role for the University in meeting its objectives on research and societal relevance and is especially good at functioning as a research hub, external funds' research generator, and networker for academics with common interests in risk and crisis research.

Productivity

Given that the RCR research is primarily based with faculty housed in the academic units (especially Sociology), overall research productivity of the RCR is assessed through the reviews of the other UoAs, including Sociology and Gender Studies, Political Science, and Criminology. However, consistent with its ambition to be more than the sum of the individual parts, the RCR contributes to productivity in a

number of respects. For example, the RCR arranges and coordinates open seminars four times a year with presentations by both RCR researchers and invited speakers from other universities and related organizations. The RCR's annual flagship conference, the ÅRE (Åre Risk Event), with participants primarily from Sweden, but also including international participants, is currently in its third year, and it grew out of a series of research seminars; the most recent (2013) ÅRE included close to 170 participants. The RCR also participates in different projects both within and outside the academic community at the regional national and international levels. Given the relatively limited resources available to the center (annual university funds in the amount of one million SEK and reduced dedicated administrative support), the productivity of the RCR is very good to excellent, although significant progress can be made.

Quality of Research

As in the previous section, the overall judgement regarding the quality of research implemented by the RCR is surveyed in detail in our assessments of the different disciplinary units, with a strong emphasis in particular on the Sociology and Gender Studies UoA as the RCR was essentially founded and developed by sociologists and about half of the RCR researchers are sociologists. There is some evidence that the research center is producing greater research synergies across several academic disciplines, such as the experimental work on reactions to risk by different public utilities (e.g., fire, police, and healthcare) currently being developed with colleagues from Psychology. The RCR has also developed research in coordination with the Swedish Defence College, among others.

Much of RCR's research is driven by the research interests of members of the Sociology UoA. The view of the expert panel is that there is significant potential for greater research engagement and collaborations with political science and criminology within the Department of Social Sciences and with other academic units across MIUN. Selectively integrating some of the research work of faculty in this area into the RCR should bolster the research center's research capabilities and also open up new avenues for research (e.g., including survey-related projects), as well as external research funding.

Networks and Collaboration

The bulk of the research projects at the RCR are carried out in collaboration with researchers in other departments at MIUN and, in some instances, with researchers at other universities, both at the national and international level. From its inception, the research center has collaborated with different networks at regional, national, and international levels. The expressed ambition is that these collaborative efforts will continue to contribute to the development and expansion of the center's research and educational efforts within the fields of risk, crisis, and disasters. These

partnerships have also resulted in the emergence of research networks consisting of an international community focusing on risk, crises, and disasters to support mutual developments within the field. Further, these collaborations have resulted in a number of applications and two key research projects discussed in the RCR's self-assessment report. Currently, the RCR is expanding its collaborative efforts with the Center for Climate and Security at Karlstad University, among others.

Societal Relevance and External Cooperation

As set out in the section of this report dealing with the Sociology and Gender Studies UoA, societal relevance for the RCR is in part a by-product of its research focus on individuals, society, and organizations. The added value that this research center brings is the perspective on crisis management and risk. The RCR also displays an impressive list of actors that its members collaborate with in various ways. A prominent example is the work for the Swedish Civil Contingencies Agency by Erna Danielsson, Erik Borglund, and Roine Johansson that seeks to develop a new strategy for "management and collaboration." This project is aimed at establishing a national model for management and collaboration of large-scale crises and disasters providing a good example of interagency and interdisciplinary cooperation and societal relevance.

A number of RCR researchers are also involved with reference groups and networks or are working as experts for public authorities; some examples are included below:

- Anna Olofsson is the new chair of the European Sociology Association's Research Network 'Risk and Uncertainty' and she was vice-chair of the network 2009–2013. She is also a member of the Swedish Society for Risk Sciences' Scientific Board
- Rikard Karlsson is a member of an expert group at the Swedish Energy Agency
- Susanne Strand collaborates with several Police Authorities
- Erna Danielsson is a member of several boards and expert groups, including the Regional Crisis Management Board, the Board of Trygghetens Hus, and the Regional Ethical Board
- Jörgen Sparf is actively engaged with the Swedish Civil Contingencies Agency's strategic work group, and the group on societal prioritizing. In addition, he is the vice president of Offsäk, and partner of the industry delegation for security and the Swedish Risk Management Association

The RCR has been actively engaged with other external organizations, including:

- various public and private partners named in the self-assessment, such as the Swedish Civil Contingencies Agency (MSB); Trygghetens Hus (Center of Citizen Safety); the County Administrative Board in Jämtland and

Västernorrland; the police forces in the counties of Jämtland, Västernorrland, Värmland, Dalarna; the County Administrative Board in North and South Trøndelag, Norway; the rescue services and the police in North and South Trøndelag, Norway; municipalities in the counties of Jämtland, Västernorrland and in North and South Trøndelag, Norway and electric power suppliers

- private organizations in Sweden, such as Globea (Regional SME); Per & Per Ledarskap (Regional SME); 4C Strategies (Consultancy company, provider of risk management solutions); Combitech (Consultancy company, combining technology, environment and security); and Sundfrakt (Regional for-profit logistics company)
- non-Governmental Organizations, such as the Red Cross and the Geneva International Centre for Humanitarian Demining.

Strategies and Plans for Development of the Unit

RCR describes its main goal to become an international center of excellence for societal risk and crisis research. To achieve this goal, RCR presents its core objectives as follows:

- Produce high quality, creative, and innovative research
- Publish articles in good quality journals and books by recognized publishers
- Significantly increase its external research funding
- Collaborate with leading national and international researchers and research centers
- Become the “first choice” for societal risk and crisis education for professionals and other individuals who would like to work in these areas
- Work closely with regional and national organizations outside of academia
- Become the “first choice” for private and public actors in contract research in RCR’s areas of research
- Establish national cooperation with public, private, and volunteer organizations in which research results are applied

Although these are long-term goals, the assessment of the expert panel is that the RCR has been moving towards these goals and objectives, but there is more to do. Our considered view is that the RCR has to be more careful about its name and “brand” or research profile. The research center has tended to follow an “all-too-inclusive” strategy, allowing everyone who wants identify themselves as “risk” or “crisis” researchers (albeit loosely connected to the primary research of the center) to join or bring their research to RCR. The recommendation of the expert panel is that the center develops a systematic process and relevant criteria to include projects as part of the RCR. Currently, there are research projects that seem to be at the periphery or the outer margins of the research conducted at the RCR. This “all-inclusive” approach should be evaluated and re-considered. The questions to be asked in each

instance is what the researchers can contribute to RCR's overall research strategy and how the RCR can benefit from this collaboration. Consequently, a strategic and targeted research approach and the development of a concrete action plan with measurable goals and outcomes will be necessary.

Strengths, Challenges, and Opportunities

Strengths

- A key strength of the RCR is its focus on a sociological (social science) approach to risk. The center has developed a well-deserved national and international reputation as a leading center in this area. It is recognized for its empirical and some theoretical research, as well as for its efforts in developing applied research.
- The interdisciplinary character of the research at the RCR. This creates opportunities to build strong funding applications (with the research center providing an important intellectual imprimatur). In addition, its collaborations with experts and practitioners, nationally and internationally, contribute to developing new ideas and new perspectives, more so than would be the case in a "traditional" academic community.
- The expert panel also identifies the RCR's ability to collaborate both within the university and on a national and international level as a major strength. Much of this is the result of a task-oriented, motivated, highly-flexible, and productive staff.

Challenges

- One of the major challenges that we have identified is linked to one of the strengths, namely the center's "inclusiveness." There is a real risk that the high status of the research center will be diluted if the RCR maintains a "broad church" interpretation of risk and crisis. It is vital to develop and preserve the "brand," reputation, and high research profile of the RCR by being more strategic, targeted, and attaching greater weight to the research center's strategic mission.
- Another challenge is to strengthen the administrative support and in particular to provide more specialized institutional support so as to help improve the center's external funding potential, particularly in the more complex European Union funding arenas.

Opportunities

- The major opportunity for the RCR is connected to its diversity, facilitated by its interdisciplinary research program and ambitions. The recent changes to the staff profile in the Political Science UoA provides an important opportunity to further strengthen the RCR both methodologically and in terms of opening up significant new research angles.
- The center staff should work more systematically to promote its research work and its societal and institutional contributions in a more strategic, direct, and targeted manner. The center should work to broadly disseminate its work (through annual reports, brochures, flyers, conferences, and workshops) at the institutional (MIUN), local, national, and international level. The contributions of the RCR have been significant, socially relevant, and with positive impacts regarding its research, educational process, and societal impact. The word on their achievements and contributions needs to get out in a more systematic and continuous manner.

General Recommendations

In the following section the expert panel provides some general recommendations regarding the UoAs that formed part of our evaluation.

1. The current lack of cross-disciplinary coordination within the Department of Social Sciences is unsustainable. In our view, the University needs to decide between: (i) separating out Sociology (incorporating Gender Studies and possibly Criminology) and Political Science as distinct departments with their own organizational structures and financial resources; the recent revitalization of Political Science provides a window of opportunity to do this. Or, (ii) take steps to facilitate greater cohesion within a multidisciplinary Department of Social Sciences while recognizing the need for a tier of discipline-specific leadership.
2. The RCR has become a well-established and one of the largest and most prominent risk and crisis research centers in Sweden, and it is beginning to expand its national and international visibility and impact. In our view, the RCR is a research gem that the institution should continue to nurture and support. As the RCR continues to: i) expand its national and international visibility and reputation; ii) expand its research base, portfolio, and external funding; and, iii) as its level of productivity and quality of the research continues to increase, senior administrators at MIUN should seriously consider transforming the RCR into a “research profile.” The RCR faculty represents a diversity of disciplines at the different MIUN campuses; it is becoming increasingly productive in terms of

their research and external funding; and it is promoting research excellence and research that is socially relevant with significant and positive societal impacts; these are key strategic goals at MIUN.

3. The UoAs, including the RCR and the Forum for Gender Studies, need to continue to diversify their research portfolios and sources of external funding. The faculty, especially in the RCR, has done a very good job at generating external funds. The institution should provide faculty, particularly junior faculty, additional time to conduct their research, develop research proposals, increase their external funding, and publish in high-quality peer-reviewed journals. Clearly, faculty can and should continue to build on the strong research foundations and traditions of the RCR and the FGV.

4. According to our review, the level of productivity (in terms of publications of peer-reviewed articles and research funding) varies significantly by UoA. We also acknowledge that significant progress has been made during the review period in these areas. However, it is imperative that faculty continue to publish their work in high-quality and prestigious academic journals and that they continue to present their research work in top-tiered international professional/scientific forums. This is critical in order to continue to increase the visibility and impact of the UoAs and MIUN. Consequently, the time that faculty devote to these endeavors should be increased, which may also require their teaching loads be reduced.

5. Some of the UoAs (primarily the RCR and Criminology) have developed research areas that are highly-specialized and applied. While this has contributed to the growth of their research portfolio as well as their external research funding, it is important that faculty establish a balance between research that is theoretically grounded, contributes to the body of knowledge in the discipline, is socially relevant, and builds on the institutional research goals and strategies of the university. This will allow the Units to continue to generate the much needed institutional support in order to grow and thrive as important disciplinary groups within the social sciences. As mentioned previously, given the level of maturity and stabilization of the Units' research focus (especially in Sociology and Criminology), this is an opportune time to consider other research strands that will allow the Units to expand its research areas, which, in their turn, will allow them to attract and recruit external faculty that will strengthen the program.

6. A strategic and targeted research plan, including the development of concrete initiatives with measurable goals and outcomes and a detailed timeline is needed for all UoAs. This will help the UoAs (and the Department of Social Sciences)

develop a cohesive and integrated research strategy and portfolio that is in line with the research aspirations at MIUN.

7. Develop strong and systematic mentoring programs that are department or program-based to help all faculty, but especially junior faculty and doctoral students develop, expand, and strengthen their research. While all UoAs can and should benefit from these mentoring programs, special attention should be given to the Political Science faculty given all the recent changes and faculty turnover that has occurred in this Unit.

8. The new staff complement in Political Science provides an important opportunity to facilitate greater engagement with the work of the RCR and thus nurture greater cohesion within the Department of Social Sciences. This will extend the horizons of the research center beyond sociological themes, bolster its work (notably in quantitative research methodology), and will facilitate the potential for wider-research collaborations across the entire Department, and will increase the center's potential for additional external research funding.

9. The Criminology Unit must reflect upon the challenges identified in this document and create a new strategy for its development that integrates the Unit within the criminological research community and raises its academic and disciplinary ambitions and research profile. In creating this strategy, we recommend that the Mid Sweden University Criminology Unit benchmarks its performance in relation to other national criminology Units in terms of FTE, research income generation, diversity of research portfolio, and publication and conference strategy. The strategy should seek to set an ambitious academic vision as well as identify realistic goals, mechanisms by which those goals can be achieved in the current institutional context, and develop a clear timeline associated with achieving those goals.

10. The Criminology Unit should take immediate action to diversify its research approach and perspective. One clear pathway is via integration of some of the junior research staff with the RCR and the development of a series of trans-disciplinary research conversations about, for example, the key terms of reference for the criminological research Unit (e.g., risk, prevention, violence, and assessment). A further strategy might be to emulate the good practice of the Forum for Gender Studies in drawing together researchers with common theoretical or empirical research interests.

11. MIUN should carefully consider its institutional reputational risk inherent in developing a broad-based criminological undergraduate degree program linked to such a highly specialized and small research Criminology Unit.

Limitations of the ARC13 Evaluation Process

In the following section, we provide a limited number of observations on some of expert panel's concerns regarding the limitations of the ARC13 evaluation process.

- The information and understanding regarding the purpose, goals, expectations, and intended outcomes of the evaluation of UoAs by expert panels varied from faculty to faculty and from UoA to UoA. Some concern was perceived regarding the intended use and impact of these evaluations on the individual UoAs and how they would impact the distribution of resources and the long-term sustainability and even existence of individual UoAs.
- The expert panel was asked to evaluate the current research of the UoAs regarding their productivity, quality, and impact. We were also asked to gauge the potential of the research programs for further growth and contributions. It is important to note that this cannot be done in isolation from the academic or educational programs, which are closely linked or intertwined with the research enterprise. The educational process and the academic programs are intrinsically tied to the research or scholarship of its faculty. Consequently, one component cannot be reviewed in isolation of the other.
- The expert panel consisted of only one (1) expert in each of the areas that we reviewed. While there was some overlap in terms of our research interests and scholarship (e.g., disaster studies and gender), the UoAs would have benefitted from a panel of experts for each of the UoAs (e.g., sociologists, political scientists, etc.).
- Although the self-assessment documents were very detailed and informative, they did not necessarily reflect the best structure and format that would best represent the UoAs. Although having a standardized format has its advantages, this does not always result in the best description or allow for a detailed review and analysis of the Unit. Moreover, we found the tables confusing and some of them appeared to have incorrect data or data that did not accurately reflect the actual situation of the UoAs in terms of staff, publications, research funds, etc. Actually, in some occasions, the UoA (at our request) provided additional information as they indicated that the data on the tables was not provided by the UoAs themselves and some tables, presumably, contained incorrect information.
- The extensive use of the Web of Science may not benefit all disciplines equally, but may place some fields at greater disadvantage than others. For example, the perception was that the use of the Web of Science did not accurately reflect the contributions and impact of the social sciences as many of the peer-reviewed journals in the social sciences may not be included in

the Web of Science. In order to determine the impact factor of the research publications, other mechanisms such as Google Scholar and Scopus should be used.

- For the UoAs, it was not clear what would be the role of the expert panels vis-à-vis the “generalists.” It was even confusing to the expert panels how they would work and collaborate with the “generalists” and how the reports of each of these groups would intersect. For example, we were informed that “The GEP [generalists] will focus on the role of the RC as such – not its scientific content that is covered by the ISEP [expert panels]” and that the “ISEP [will] look upon these questions from a scientific point of view while the GEP takes a general approach.” These two areas are fundamentally intertwined and cannot function or be evaluated independently of each other. Further, it was not clear what would be the final outcome/product of the “generalists” and how their reports and recommendations would impact the research centers. While the meeting of the expert panel and the “generalists” with the RCR went quite well, it was mostly redundant to the expert panel as we went over the same presentation that was made to the expert panel on the previous visit. Consequently, this was not the best and most effective use of the expert panel’s time.

UoA 3.2 Sociology and Gender Studies Faculty of Human Sciences

Experts: Prof. Havidán Rodríguez, Prof. Jo Phoenix, Prof. David Farrell and Dr. Kjell Mo.

General assessment

Sociology and Gender Studies are academic programs within the Department of Social Sciences. Based on our review and site visit, the Sociology and Gender Studies Program seems to be a well-integrated, cohesive, and very productive group. It was highlighted to the expert panel that this has been the result of “*reflection, planning, and organization*” of the program and the research work of its faculty; it is quite apparent that they have done so. It is also evident that the Sociology faculty established and is deeply imbedded in the research traditions of the RCR. Actually, close to half of the RCR researchers/staff members have their academic home in Sociology; we were also informed that close to 75% of the RCR research funding emanates from the faculty researchers in the sociology program.

Although, at one time, Gender Studies formed part of the Social Work program, it now resides within Sociology. It is important to note that we were informed that Gender Studies was not officially part of the ARC13 evaluation process, but they decided to insert themselves within the evaluation process, producing for this review a publication titled *Mobilizing Gender: Challenges and Opportunities*. This publication focused on the research and strategic initiatives and projects of the Forum for Gender Studies. This clearly shows the strategic focus, leadership, drive, and strengths of this program. Although the Gender Studies program resides in Sociology within the Department of Social Sciences, it is an interdisciplinary and intercampus platform that initiates and coordinates gender-related research throughout the institution at all three campuses. A key component of the Gender Studies program is the Forum for Gender Studies (FGV). The work and development of the Gender Studies Program and the FGV is quite impressive.

The Sociology and Gender Studies Unit has three (3) distinct research foci, including Risk and Crisis Research, Gender Studies, and Working Life. An important highlight for Sociology is that the Unit houses the major journal for the Swedish Sociological Association. Although part of the reason this journal is currently housed at MIUN (the first time it has been housed outside a “major” institution in Sweden) is the high membership fees paid by MIUN, it nevertheless brings a sense of prestige and it increases the recognition and visibility of the Sociology Unit at MIUN, regionally and nationally. This Unit has significant national and international collaborations, which seem to be primarily the result of the RCR and the FGV. An important feature of this Unit is its interdisciplinary collaboration; again, this is mostly a function of the research that is being carried out at the RCR and the FGV. Consequently, this Unit

has become a hub for research activities. The Sociology Unit runs an undergraduate program in Risk and Crisis Management that is closely connected to the RCR; the Unit also has doctoral program status, which is critical for its research growth and development.

According to the information provided, the staff in Sociology and Gender Studies consists of nine (9) core faculty, including two professors, four associate professors, and three senior lecturers. In addition, they currently have nine doctoral and two post-doctoral students. According to the self-assessment document, most of the research carried out by the sociology and gender studies faculty takes place within the established structures, such as the RCR, the FGV, and the network for research of working life or NAFS. Consequently, as stated previously, these are the three major or critical research areas for the Sociology and Gender Studies Program. Although the RCR was formally established as a center in 2010, the sociology faculty has actively been pursuing research in the area of risk and crisis since 2003. The faculty's major research interests focus on peoples' understanding of risk, with an emphasis on perception of risk, risk communication, and sense-making of risk. Another important risk/crisis research area focuses on management, organization, and collaborations.

The Gender Studies program is a unique forum, a pan-university platform that performs two important institutional functions:

- It brings together researchers with an interest in the area of gender studies and thereby provides vital socialising, networking, and mentoring opportunities. Evidence that they were performing well in this regard was provided in relation to the range of disciplines represented in the funded research projects.
- It acts as a research hub to generate ideas and research proposals and to develop a gender studies 'brand' at MIUN. Evidence provided to the panel shows that they were successful in this area included the research grant revenues they have generated; their ambitions to develop a new theoretical framework for gender studies in the 21st century; and the success they had in winning a prestigious Swedish Research Council award to fund their work.

We should note the program aims to use their networks and collaborations in order to establish a "Nordic Gender Studies" school of thought that would rival the North American and United Kingdom dominance in the field. Further, the Forum for Gender Studies aims to establish a critical mass of faculty in the program, reinforced through research collaborations and supported by stable funding. The primary research foci of Gender Studies can be divided into three major areas: gender and normalization in neoliberal times, a lifetime of gendered cultures, and gender and working life conditions, the latter being an important focus area for MIUN.

It is important to reiterate the interdisciplinary nature and the multi-campus

collaborative research efforts of both the sociology and the gender studies programs. The sociology and gender studies faculty are linked by similar research interests in the areas of risk, power, and governance. We urge the program to continue to explore and expand these research collaborations and intersections, which will continue to enhance and strengthen the Unit in terms of its educational offerings as well as its scholarly contributions. The expert panel was very impressed with the ongoing work of the Sociology and Gender Studies Unit.

Productivity

The Sociology and Gender Studies Unit, but especially Sociology, is at the core of the RCR. In essence, the RCR was established and developed by sociologists. Much of the research growth in the RCR is a result of the contributions of the sociology faculty. Clearly, sociologists have engaged in interdisciplinary research work that results from the active participation and collaboration with faculty in other disciplines at the national and international level. In terms of research funding, Table B1.2 in the self-assessment document shows that Sociology and Gender Studies have generated over eight million SEK in external research funding in 2010 and 2011, respectively, and over nine million SEK in 2012. The total (internal and external) research funding was over 13 million SEK in 2011 and over 16 million SEK in 2012. There has been a trajectory of increased external funding in the Sociology and Gender Studies Program during the period under review (2007-2012). Since 2008, external research funds have been close to or over half of the total research funds in this Unit. The Sociology and Gender Studies Unit is developing a very strong research portfolio with significant external funding from the Swedish Research Council, Swedish foundations, and other public sources. However, there was very limited to no research funding from industry during the review period. Faculty members report that the total research funding for the period under review is slightly higher than that reported in the research funding tables included in the self-assessment report.

The faculty in the Sociology and Gender Studies Unit has also been quite productive in terms of their publication record. The number of peer-reviewed publications in journals (about 50 articles), during the review period, has been significant, especially given the number of research FTEs reported for the Unit. The number of publications reported in DIVA (about 184) is also quite impressive. The number of publications in the Web of Science are significantly lower (about 28), but this could be an artifact of the bias in this reporting source in terms of the exclusion of a significant number of social science journals. This group of faculty has also been actively participating in writing book chapters, conference papers, and other types of reports.

Faculty in the Sociology and Gender Studies Unit has been very active in terms of presentations at professional and scientific conferences although there is room for improvement in this area. Their participation in the scientific or professional community, especially as reviewers for international journals, participation in

research councils and foundations, members of program committees, and members of national and international scientific councils, is noteworthy. All in all, during the period under review, the Sociology and Gender Studies Unit has been a very productive group in terms of their research funding, publications, presentations in professional/scientific forums, and regarding national and international collaborations. This is all the more impressive given the limited number of FTE staff devoted to the research enterprise in this Unit⁶.

Assessing the Quality of the Research

The quality of the research generated in the Sociology and Gender Studies Unit is noteworthy. We have assessed the research of this Unit as good to very good, with evidence of some work being very good to excellent, especially in the risk and crisis and gender studies areas. Faculty contributions to their corresponding research fields, especially in risk-crisis and gender studies areas, are significant and socially relevant. A number of the journals in which faculty are publishing are some of the ones we would expect them to be publishing in given their fields of expertise. Some of the journals are ranked good to very good to excellent for the corresponding fields. For example, we would expect faculty in this Unit to be publishing in journals such as *Gender, Work, and Organization*; *Gender, Place, and Culture*; *Nordic Journal of Feminist and Gender Research*; and *Gender and Education*, among others. Faculty in Gender Studies are indeed publishing in these journals. Faculty in the risk and crisis research area would also be expected to be publishing their work in the *International Journal of Emergency Management, Disaster Prevention and Management, Disasters*, etc. There are a number of faculty publications in some of these journals as well as other international journals.

While it is important for faculty to publish their research in these types of journals, these are not some of the top-tiered journals in the field of sociology or in the area of risk. Actually, the self-assessment report highlights faculty concerns regarding publications in low-impact journals and that publications may be a “weak spot” for the Unit given that they devote significant time to publishing in other venues rather than generating more peer-reviewed articles.

It is imperative that the Sociology and Gender Studies Unit develop a concrete publication strategy especially aimed at publishing their research in peer-reviewed, national and international, journals, which are germane to and prominent in the field of sociology and gender studies.

⁶ It should be noted that according to the information provided during our site visit, the tables included in the self-assessment reports apparently tend to underreport the productivity of the faculty in the UoAs in terms of their research funding and publication record.

Further, we strongly encourage faculty to actively present their research in top-tiered national, and especially international, professional/scientific forums. These strategies will allow them to increase the visibility, reach, and impact of the Sociology and Gender Studies Unit and the research conducted by its faculty. There is no doubt that, at this time, the visibility of the Unit is tied to the visibility and productivity of the RCR and the FGV. While it is important that these research collaborations continue to grow and be strengthened, it is also important for the Unit to diversify its research portfolio to include other areas that are of critical importance and relevance to their disciplines and to Sweden and beyond.

Societal Relevance and External Cooperation

As indicated previously, the work of the Sociology and Gender Studies Unit is intrinsically linked to the research work taking place at the RCR and the FGV. In our view, the work conducted by the sociology and gender studies faculty is socially relevant, has significant and positive societal benefits, and prepares students to enter the workforce and become contributing citizens. It is noteworthy that two undergraduate programs are run by the faculty, including the Program of Risk and Crisis Management and the Human Resource Management and Labour Relations program.

The research activities and events organized by the NAFS, the FGV, and the RCR (all which have faculty from Sociology and Gender Studies) have significant outreach components to engage faculty, students, and national and international organizations and agencies, as well as institutions of higher education. Detailed information regarding external cooperation and other collaborative activities are contained within the section for the RCR in this report given that the Sociology and Gender Studies Program is closely linked with this research Unit. Suffice it so say in this section that the Sociology and Gender Studies Unit has significant external collaborations and, given the type of research that faculty engage in, their contributions to the general society, within and outside of Sweden, are positive and significant in terms of the services provided, and their educational initiatives and research collaborations. These types of services and benefits are highlighted through seminars and conferences, such as the annual Åre Risk Event, international workshops/conferences organized by the FGV, and the Higher Education Series organized by the Sociology and Gender Studies Unit.

Finally, collaborations with external organizations is significant and are summarized in the RCR section of this report although there appear to be other significant collaborations with the Swedish Foundation for Humanities and Social Sciences, the Disaster Research Center at the University of Delaware, Lund University, Kings College, Melbourne University, Norwegian University of Science and Technology, and the Center for Women's Studies at York University, among others. Indeed, the external collaborative initiatives and activities of the Sociology

and Gender Studies Unit are significant and impressive; this is in large measure due to their close affiliations with the RCR and the FGV.

Strategies and Plans for the Development of the Unit of Assessment

In this section, we provide a short overview of the UoA's proposed strategies and plans for development as well as some recommendations by the expert panel.

- Although clearly stated in their self-assessment document, it is very important that the Sociology and Gender Studies Unit continues to diversify its research focus and strategies while at the same time ensuring they maintain a strong foundation in the sociological and gender studies research traditions, extensive body of knowledge, and theoretical frameworks. Further specialization of research areas by the faculty can result in isolation or marginalization, at both the national and international level, of these researchers and their Unit as a whole, as they may be perceived as having too much of a narrow sociological focus with a high degree of specialization.
- With the above recommendation in mind, the faculty in the Sociology and Gender Studies Unit needs to continue to enhance and expand its interdisciplinary research collaborations in order to continue to increase the amount of external funding that is being generated. However, this expansion needs to be developed strategically and systematically in the context of the Unit's academic and research goals and ambitions. A strategic and targeted research approach and the development of a concrete action plan with measurable goals and outcomes will be necessary.
- Although there are significant ongoing international collaborations, it is imperative that the Unit continues to expand its international collaborations both in terms of scholarship and external grant funding. Again, a targeted and strategic international research action plan is indispensable.
- The faculty has produced a significant number of publications, including peer-reviewed journals, book chapters, etc. Nevertheless, it is essential that the faculty continue to increase their publications in peer-reviewed, top quality journals and increase their presence and participation in international conferences. For example, whilst their vision is convincing, the expert panel encourages the Gender Studies faculty to think about the practical mechanisms by which they can achieve their goals and the type of conference and publication strategy they would need to do so, targeting journals such as Women's Studies International Forum.
- The expert panel recommends that the Forum for Gender Studies raises its ambitions to think in terms of bidding for funding for a research program of connected projects that are theoretically informed empirical analyses. The Forum for Gender Studies has already recognized the growing research area

loosely called “girlhood studies” and could strategically position itself to deliver a research program in that area.

- Gender Studies may want to look across to other institutions to see how gender and sexualities studies have been organized and funded. We recommend that they look at two examples: The University of Utah Gender and Sexualities studies funded by benefaction and Durham University Center for Sex, Gender, and the Sexualities annual postgraduate conference/workshops drawing together young and established scholars.
- Given that the primary (albeit not exclusive) research focus of the sociology faculty is in the area of risk and crisis, the Unit as a whole needs to continue to enhance, expand, and strengthen its partnerships with local, national, and international agencies and organizations. Further, partnerships with industry could result in critical funding opportunities for these types of programs.

Strengths, Challenges, and Opportunities

In the following section, we provide a summary of the strengths, challenges, and opportunities for the Sociology and Gender Studies Unit.

Strengths

The Sociology and Gender Studies Unit has a significant number of strengths, some of which are highlighted below:

- It appears to be a closely knit, integrated, and cohesive Unit with very productive faculty.
- The Gender Studies program is a unique forum, a pan-university platform that performs important institutional functions with a group of highly committed and productive faculty.
- Two major strengths of the Sociology and Gender Studies Unit are the RCR and the FGV. These are instrumental components of this Unit although the RCR resides at the Faculty level and the RGV at the institutional level. The contributions and impact of these programs and research center have been both significant and impressive.
- The Unit has given considerable thought to its research areas and has concentrated their research efforts in a number of limited areas building on the strengths of its faculty. The focus on limited research areas has allowed the group to develop significant strengths in three major areas. While this is certainly a strength, further specialization can result in the academic marginalization of the group and will continue to contribute to their ongoing difficulties in recruiting external faculty. Therefore, given the level of maturity and stabilization of the Unit’s research focus (especially in risk

and crisis), this is an opportune time to consider other research strands that will allow the Unit to expand its research areas, which, in turn, will allow them to attract and recruit external faculty that will strengthen the program.

- The societal relevance and impact of this Unit, especially through the RCR and the FGV, has been significant and impressive.
- The Sociology Unit is using its doctoral program very effectively to enhance and strengthen its linkages with both criminology and gender studies. We strongly encourage the Unit to continue to invest some of its resources in this area as this will serve to expand and strengthen its collaborations and will also contribute to the cohesiveness of the Department of Social Sciences.
- The Unit has been able to generate a significant amount of internal and external research funding, primarily through its association with the RCR and the FGV.

Challenges

- The Sociology and Gender Studies Unit's recruitment of faculty has been primarily internal rather than external; the Unit acknowledges this is as a challenge or a weak spot that needs to be addressed in order to expand and strengthen the program.
- The Unit's self-assessment also identifies their publications as a weak spot, especially given the fact that many researchers (especially those associated with the RCR) spend significant amounts of time writing reports and other types of documents. As mentioned previously, a more systematic and strategic approach needs to be developed in order to enhance the publication record, particularly as it relates to peer-reviewed articles, citations of the work, as well as its impact to the sociological and gender studies body of knowledge. More publications are needed in mainstream journals.
- One of the major challenges that the Unit confronts is its dichotomy between applied/practical vis-à-vis theoretical research that contributes to the body of knowledge in the field of risk and crisis. While both approaches can co-exist within the Unit, it is important that faculty establish a balance of research that is theoretically grounded, contributes to the body of knowledge in the discipline, is socially relevant, and builds on the research priorities and strategies of the University, which will allow the Unit to continue to generate the much needed institutional support in order to grow and thrive as an important discipline within the social sciences and one that is instrumental for the growth and development of the research infrastructure that the institution aims to develop, support, and promote.
- External research funding will be critical for further growth and development of the UoA. Diversifying the sources of funding is also important.

Interdisciplinary and international collaborations will be instrumental for the further growth of the UoA. Increased competition for external funding from other institutions can become a challenge. However, given the strong research foundations, traditions, and reputation of the RCR and the FGV, we anticipate they will have a strong competitive advantage in the external funding process, especially in Sweden.

Opportunities

- The greatest opportunity for the Sociology and Gender Studies Unit is to build on and expand the excellent work that is being conducted at the RCR and the Forum for Gender Studies. These two “units” can continue to provide a very strong research foundation for all the UoAs with the Department of Social Sciences; and it can contribute to increasing faculty productivity as measured by publications in peer-reviewed journals, presentation in international forums, and increasing the external funding for the Unit.
- The UoA should take advantage and expand its interdisciplinary and international research focus. This will result in significant benefits and increased visibility for the UoA and MIUN.
- The increased national and international focus on risk, crisis, and security provides important opportunities that will allow the UoA to enhance and expand its research portfolio and increase its external research funding. The UoA should be made keenly aware of these opportunities and should be provided the institutional resources to do so.
- The Sociology program can now recruit and train doctoral students. The faculty should focus on developing a rigorous state-of-the art program that builds on the strong research traditions and reputation of the RCR. The program should also continue to expand its interdisciplinary focus to include doctoral students recruited from other social science disciplines, as it currently does with Criminology and Gender Studies. A strong and vibrant doctoral program can contribute to increasing the reputation, visibility, and impact of this UoA and of the RCR.

UoA 3.3 Criminology Faculty of Human Sciences

Experts: Prof. Havidán Rodríguez, Prof. Jo Phoenix, Prof. David Farrell and Dr. Kjell Mo.

General assessment

Criminology has been called a rendezvous discipline in that it is comprised of a variety of disciplines that “meet” around issues of crime, law, offenders and offending, victims and victimization, justice, and punishment. The majority of criminological research has its disciplinary roots in either sociology or psychology. Like other disciplines, criminological research ranges from the development of theories and concepts through to theoretically informed empirical analyses to highly applied (often termed “administrative”) criminology that works closely with the knowledge and training agendas of criminal justice and penal agencies. The Mid Sweden University criminology Unit of assessment is a research program within the Department of Social Sciences. It defines itself as doing “applied criminology” as a means of distinguishing itself from sociological criminology and to signal its broad orientation towards criminal justice agencies and other non-academic research users.

The expert panel noted that although criminology was assessed as a disciplinary Unit, it is in actuality too small. The Unit is best characterized, not as a discipline group, but as a highly specialized single research *strand* conducted by an exceptionally small group of individuals, framed by a single approach with its disciplinary roots in forensic psychiatry and psychology, and driven by a set of clinical concerns with managing and assessing risk of violence. The researchers cohere around the risk factor prevention paradigm, which is a relatively marginal paradigm within academic criminology. The UoA’s key reference points are not criminological, per se (as evidenced by conference participation, choice of journals for publication output, memberships of professional bodies and international networks), but rather psychological.

From the documentation provided for this review, there is evidence of an attempt to broaden research beyond the risk factor prevention paradigm towards the role of aggression and frustration in violence amongst dyslexic individuals and the characteristics of violence in women. That said, these emerging research questions remain dominated by a similarity of approach and perspective. Such high levels of specialization within a research Unit is unusual within the field of criminology. More sustainable and stable research configurations are those which are based on a broader range of research interests as well as approaches and perspectives to research. We noted that it is possible for Mid Sweden University to be a center for excellence in *psychological and applied criminology*, given that there is very limited competition in this field in Sweden, but we also recognized that the current configuration of

the research Unit is too small and too narrowly focused on a risk factor prevention paradigm to achieve such an ambition. We also noted that Swedish criminological research seems to be a vibrant and growing field of inquiry, as highlighted below:

- Stockholm University's Department of Criminology is the largest criminological player in the field; there are also Swedish criminology research groups in most other Swedish universities, including those working within a psychological tradition;
- The Scandinavian Research Council has a specific strand for funding criminological research;
- There is the Stockholm Criminology Symposium annual event;
- And, the winner of the 2012 Stockholm Prize for Criminology was Professor David Farrington who is one of the key academics to open up the risk factor prevention paradigm and who is a significant research leader in life course and developmental criminology.

Within this national context, the two key challenges for the criminology discipline at Mid Sweden University are its size and, as a related function, the lack of diversity in its research approach and disciplinary interests.

Productivity

During the period of review, the Criminology Unit of assessment has experienced significant growth to include 13 staff members in 2013 comprised of one professor, one associate professor, two senior lecturers and four senior lecturers on fractional appointments, and five subject teachers. It is the understanding of the expert panel that senior lecturers are not expected to do research, unless they are able to fund that research via external funding, and that subject teachers are not involved in research at all. Thus, the actual research capacity, expressed by the Unit of Assessment itself, in the form of FTE calculated by measuring the percentage of research time per faculty, is 1.81 FTE. Information from the faculty indicates that by 2012, there was less than 1.3 FTE research capacity in the Criminology Unit. Our calculations, expressed in terms of a head count, is that the majority of the publications have been produced by four individuals, with only two of those having allocated time for research, but the Unit has, in effect, had only one key researcher since 2007.

It is important to note that the Criminology Unit of assessment, therefore, is both 'immature' as a research Unit and *exceptionally* small relative to other criminological Units of Assessment in Sweden, Europe, the UK, North America, Australia, and New Zealand; almost too small to be meaningfully assessed as a Unit. In terms of productivity, it is also poorly positioned as a Unit of *Criminology* given that there are very few research inputs or outputs that are specifically criminological. Yet, notwithstanding the challenges of being a very small Unit with little research

capacity, there is evidence of high levels of productivity as measured in terms of publications, or more specifically the total publications that have been selected for inclusion in the self-assessment documentation. For the period under review, 1.81 FTE produced 21 publications in peer-reviewed journals and 6.5 other academic outputs, three key user manuals for assessing risk of violence, four reports, and 20 abstracts and other conference presentations. Thus, this limited group of faculty has had a very productive period as measured by the number of publications. There is also evidence of an upwards trajectory in grant winning, albeit from only one source (i.e., “other public bodies”).

Quality of Research

The majority of publications of the Unit are in peer-reviewed international journals with some of these being high ranking journals of relevant professional bodies. Notwithstanding this evaluation, the expert panel has some significant concerns about the research in relation to its *academic* and *disciplinary* quality and merit. The Unit of Assessment describes itself as conducting *applied* research. It is noteworthy that the expert panel may have not had access to all the research studies and publications of the Criminology UoA. However, in our view, and based on the information we had available, **most** of the Criminology UoA publications **seemed to be** in the general area of evaluation studies.

Across the Unit of Assessment, there is limited evidence of engagement with the development of criminological concepts and theories or engagement. As the self-assessment document makes clear, and as was reiterated during the site visit, the ambitions of the Unit are not to develop any broader research interests beyond developing tools that will service the needs of practitioners within criminal justice (i.e., “to find methods that practitioners can work with in order to prevent violence and protect victims”) rather than to contribute to the production of criminological (or indeed psychological) knowledge. The challenge facing this Unit is that because it lacks diversity of research interests and approaches (mostly a result of the very small size and relative immaturity of the Unit), the research outputs are heavily skewed towards largely empiricist reports of research conducted. To be clear, within any Unit of Assessment comprised of a larger number of researchers, it is possible for the Unit to produce excellent quality of research, at the forefront of *knowledge* production, as that work which is highly applied with a strong empirical tendency will be absorbed into the overall work of the Unit.

A further concern of the expert panel was the challenge faced by the Unit in presenting themselves as a *criminology* Unit of Assessment. It would be expected to see such a Unit of Assessment producing research that addresses some of the wider debates within criminology. In this case, it might be expected to see research publications that speak to contemporary debates about the efficacy (or otherwise) of the risk factor prevention paradigm, or the extent to which concerns about rising

rates of female violence are, at least in part, attributable to statistical artifices and changing sensibilities of the police. However, across the publications submitted for assessment, there is limited evidence of engagement with these (or other more relevant) debates. Similarly, there is limited evidence of engagement with debates within other forms of less sociologically informed criminology, such as life course or developmental criminology, psychosocial criminology or biosocial criminology – all of which are currently vibrant subfields of criminology. Evidence from the content of the publications, the publication outputs (only one publication is placed within a high ranking ‘mainstream’ criminology journal), the conferences attended (none of the major national criminology learned society conferences have been attended), and editorial board memberships and networks, show that criminology at Mid Sweden University is only loosely connected with the *discipline* of criminology (however broadly defined) and much more connected with forensic psychology and psychiatry and the risk factor prevention paradigm.

Two further points are worth noting. First, at the international level, the risk factor prevention paradigm research is a highly specialized and small strand of criminological research. Second, many of the concerns we, as an expert panel, have are in part constituted by the attempt to evaluate the work of only three individual staff members as a *Unit* of assessment.

Network and Collaborations

Notwithstanding the concerns that the expert panel has about the challenges facing the criminology Unit of Assessment in relation to the expectation that the Unit should produce high quality research measured in relation to its academic and disciplinary merit, the MIUN Criminology Unit is very well networked with other key researchers and universities working on similar violence prevention risk assessments. There are key collaborations with Simon Fraser University and Monash University, collaborations which have produced outcomes in terms of further research, publications, and, in the case of Dr. J. Storey, the recruitment of a new staff member to the team.

Societal Relevance and External Cooperation

The strength of the Criminology Unit is inherent in the capacity of its research for co-production. Because the research is practitioner-based, it is not possible for it to be conducted without a high degree of integration between the researchers and external professionals, particularly with the police and with forensic psychiatric services. We noted, in particular, good collaborations between the Unit and three police districts as well as the excellent collaborations between the Unit and the Forensic Psychiatry Center in Sundsvall. Specific outcomes of collaboration were the provision of training and education in risk assessment for regional and local police and forensic psychiatrists based on the research conducted, and the way in which

the needs of the police and forensic psychiatrists help to shape the specific research questions of the team. In relation to the latter, there is strong and clear evidence that the engagement of practitioners in this field improves the quality of this highly specific field of research. At the moment, these collaborations remain at the local and regional level. To maximize the strong ethos of co-production in this field of research, a natural progression would be for the Unit to meaningfully engage with the emerging National Police Board.

Strategies and Plan for Development of the Unit

The expert panel was unconvinced and had significant concerns about the strategies and plans for the development of the Unit. The self-assessment document provides a set of aspirational statements (i.e., to be a nationally leading research group on risk assessment for violence and to maintain the international reputation provided by the research of Professor Belfrage) and identifies some targeted areas for development (i.e., expansion of staff, recruitment of PhD students, provide research seminars, publish papers, and attract funding). As expressed to the expert panel in the course of the presentation of the Unit, much more narrow and focused ambitions were presented, namely to continue to develop the tools already in existence.

The panel's concerns were twofold. The Unit had not engaged in, or reported in the self-assessment document, a discussion or debate about the difficulties and challenges that it faced in relation to engaging in such a highly specialized single research strand. Instead, they focused on the challenges of being a small research group. There also seemed to be no evidence of an ambition for the group to integrate its *academic* heart into the discipline of criminology or to expand or diversify its research paradigm or approach beyond risk assessment for violence prevention. The risk for the Unit is that by expanding only in this single area, it will be unable to recruit suitable staff, unable to compete on a national or international level for prestigious grants (such as research council funding, Horizon 2020 funding, and the like), and will be unable to attract high caliber PhD students. The risk this poses to the University is that the credibility of its claims about being a university with criminological research in its portfolio will be questioned. This has the potential to raise questions about the relationship between criminological research at Mid Sweden University and its highly successful criminology undergraduate degree program. Finally the stated strategy did not contain information about how it might achieve its stated aims, what the key priorities of action might be, and how those might be implemented. In light of a lack of recognition of the key challenges it faces, we found the stated strategic plans insufficient.

Strengths, Challenges, and Opportunities

Strengths

The key strength of the Criminology Unit is its co-production. In the case of this small Unit, co-production is achieved at the cost of a strong or broad disciplinary research profile.

Challenges

In our opinion, the key challenges facing this UoA are as follows:

- By national and international standards, this Unit is exceptionally small.
- It is focused on a single, specific research strand that by its overtly empirical nature does not engage with the key debates and issues of the discipline (i.e., it is working at some length from mainstream psychological, psychosocial, biosocial or sociological criminology).
- It is not ‘well-socialized’ in criminology in that it has not formed networks or collaborations with other criminologists in the Nordic countries.
- It is not well-integrated within the RCR in that, although there has been collaboration, there is little evidence of “cross-fertilization” of ideas and/or research agendas. Instead, risk assessment and violence prevention appear as an “add-on” to the research work of the RCR.
- Finally, loss of either of the two key academics would call into question the continuing viability of the Unit, as presently configured.

If the current recruitment strategy is pursued (i.e., expanding through the recruitment of researchers also specializing in this highly specific approach to research) and the Unit expands, the potential for the Unit to win grants is likely to become more, not less challenging. Shift in policing policies and practices away from education and training in structured risk assessment tools could result in a potentially terminal decline of funding opportunities. To put this in context, outside the forensic psychiatric context, risk assessment tools aiding structured professional judgments do not form the core of police or criminal justice practitioner work. Moreover, their adoption is reliant on such forms of practice being seen as “best practice.” In other countries, criminal justice agencies are moving away from the use of risk assessment tools towards increasing the capacity for professional discretion. That the Unit has had such success in Sweden is a strength, but this strength comes at the cost of diversifying the research grant generation capacity and potential of the Unit (i.e., research councils and other prestigious grant providers do not tend to fund such highly applied research) and it comes at the continuing cost of the Unit being reliant on single sources of research income (i.e., “external other bodies”).

Opportunities

The key opportunity facing the criminology research Unit is the role it could potentially play within Department of Social Sciences to facilitate co-production and/or be the main discipline that ensures the department fulfills its institutional responsibilities for co-production.

UoA 3.4 Political Sciences Faculty of Human Sciences

Experts: Prof. Havidán Rodríguez, Prof. Jo Phoenix, Prof. David Farrell and Dr. Kjell Mo.

General assessment

Generally speaking, Political Science is a broad discipline that ranges across three main areas: comparative politics (which generally also incorporates attention to the local politics of the country that the department is located in), political theory, and international relations. In a Unit of this size, a rational strategy is to focus on one of these areas (while ensuring that the education provided to the students ranges across all three). On the whole, this has been the strategy here although it is a strategy that the Unit is now better placed to follow than before.

In the self-assessment report provided by the Unit, the focus was placed on politics at the local level. This represented a good attempt to find a single “common denominator” for the research of all colleagues in the Unit, but it raised concerns among the expert panel about the level of research ambitions of the Unit and its faculty. Given the recent changes in the staff profile, this strategy is in need of renewal.

This is a UoA that has gone through considerable change over recent years, including the departure of senior staff, a shift in the profile of faculty members (resulting in a high proportion of early career staff), and most distinctly the very recent arrival of Professor Bengtsson, whose contract at MIUN started only in the past few weeks. Consequently, a large proportion of the material contained in the self-assessment report is redundant. Much of the record of the 2007-12 cycle referred to in the self-assessment report relates to colleagues who no longer work at this institution. The expert panel report, therefore, focuses on the current compliment of staff, their research interests and record, and the new UoA’s strategic plans.

The research of this Unit covers a number of the key fields in comparative political science. Professor Bengtsson’s arrival has dramatically bolstered their coverage of political behavior, with research interests shared by several colleagues in elections, public opinion (social trust), and parties (notably, Wörlund, Wallman-Lundåsen, and Bolin) – creating the potential for one of the strongest areas of excellence in Sweden in one of the most vibrant sub-disciplines in political science. This group could certainly put MIUN on the map nationally and internationally.

A second strand of research is grouped around regionalism (e.g., S. Nyhlén, Svensson or Olausson’s work on islands) with potentially interesting links with work elsewhere in the University on the theme of tourism and continuing potential to forge societal links locally and regionally. A third strand covers governance (J. Nyhlén), political agency (S. Nyhlén, ongoing PhD research), and themes relating to

democracy (Högström on measuring quality democracy and Lidén on e-democracy). In our discussions with the members of the UoA, we were provided with a frank assessment of the challenges it faces:

- The recognition of a need for a fresh and more up-to-date strategic review of its research profile and potential;
- The expressed desire to socialize new staff and to nurture and mentor junior colleagues;
- The ambition to raise its game particularly in attracting external research funding; it has tended to attract the lowest proportion of external funding of any of the UoAs in the Department of Social Sciences (Table B1.2.2).

Productivity

The high faculty turnover means that much of the data provided in the tables included in the self-assessment seem to be of limited value. The expert panel sought – and was provided with – more up-to-date material referring to the current staff profile. The current count of faculty consists of two professors, two associate professors, one post-doctoral student, and six assistant professors (senior lecturers) – a total staff complement of 10, seven of whom have time allotted to them in their workload models. We learned that assistant professors are on teaching-only contracts unless they have secured a research grant. In this instance, three assistant professors are not on research grants. This results in a total of seven staff of relevance for this analysis regarding the research productivity of the Unit.

The expert panel was given details regarding the publications of all current staff from 2007 to 2012. These seven staff members are responsible for publishing over this period: nine books, 22 refereed journal articles, and 21 book chapters – a good overall rate of output, revealing some exceptional performance (very good to excellent) by several individuals in the UoA particularly in the area of political behavior.

Quality of Research

Because of the high faculty turnover, the ratings provided in the B2.2 tables are also of limited value in determining the quality of research of this UoA. An additional problem, common to most social science disciplines (with the exception of Economics), is that the World of Science citation counts are an inadequate measure of research quality. A future review would be advised to triangulate such data with Google Scholar and Scopus counts that, for instance, provide a wider coverage of journals and also take into account non-journal publication outlets.

The quality of research – based on the selected publications provided in advance of this review – had been a cause for some concern, but the new information provided by the Unit shows how research quality has since stepped up a gear, ranging from good to very good, and excellent in a few cases. There is good evidence of high

impact journals being targeted by a number of the faculty members, for instance: *West European Politics, Government and Opposition, Journal of Elections, Public Opinion and Parties* and *Quality and Quantity*. These journals are well regarded in comparative politics science. There is also evidence of a healthy trajectory of new work in the pipeline, as revealed particularly by the fact that many of the faculty members are now attending the leading international political science conferences, such as American Political Science Association, the European Consortium for Political Research, the Midwest Political Science Association, and the Elections, Public Opinion, and Parties group. As the research ambitions of this Unit unfold, the expert panel would encourage faculty members to target the highest tier of journals (e.g., *American Political Science Review, American Journal of Political Science, or British Journal of Political Science*). Another good measure of research quality is the large (relative to the small number of staff FTEs) and growing number of PhD students in this UoA.

Overall, the UoA's research quality is good to very good, with a pool of individuals (particularly in the behavioral end of the Unit) publishing high quality, internationally recognized work that is very good to excellent in standard. As set out below – and as recognized by the new leadership of this Unit – there is also need for the Unit to raise its game in attracting external research grants; Professor Bengtsson's record in this regard augers well in achieving this ambition.

Networks and Collaborations

As the self-assessment report demonstrates, and reflecting the long-standing research interest in regionalism, the UoA has well-established networks with a number of universities across the Nordic countries (most particularly with Åbo Akademi). The arrival of Professor Bengtsson will be transformative in forging important inter-institutional linkages with major international networks in the field of electoral behavior, such as the True European Voter project, the Comparative Candidates Survey, and the Nordic Research Group on Elections and Democracy. Furthermore, her role as a leading member of the Finnish National Election Study (which is set to continue) provides direct input to the influential Comparative Study of Electoral Systems (CSES) project. Combined with existing international links in party politics research, notably Dr. Bolin's collaboration in the Political Party Database project and Dr. Wallman-Lundåsen's involvement with the European Values Study Network, this UoA has the potential of becoming a European center of excellence in parties and elections research.

Societal Relevance and External Cooperation

By its nature, in many areas of political science, societal relevance can be a by-product of the research focus of the faculty members. As was clear from the self-assessment and in the presentation of the UoA, members of the Unit are active in the media (broadcasting and newspaper); and much of their research output (e.g.,

in the study of electoral behavior) has direct policy relevance for practitioners. Another prominent way in which societal relevance is demonstrated is through the involvement of colleagues in debates over regional planning, sustainability, and the politics of the region in which the University is located.

Clearly, the main vehicle for facilitating greater coordination of external cooperation across the departments is through the work of the Risk and Crisis Research Center. As set out below, there is an opportunity for this Unit to have a more active role in the RCR that would be to the benefit of both Units.

Strategies and Plans for Development of the Unit

In their presentation, the members of the Unit set out some clear strategic plans that the expert panel endorsed, notably:

- To consolidate and stabilize processes and develop best practices in mentoring (e.g., on grant applications);
- A re-emphasis on the need for regular participation at leading political science conferences, especially at the international level;
- Raising the profile of the Unit nationally and internationally.

The expert panel feels that, given the staff turnover, this would be an opportune occasion to implement a fresh self-assessment of the Unit, and, in particular, to re-think the expressed ambition to focus on politics at the local level. It is noteworthy that the existing Political Science “higher education seminars” will facilitate research synergy among faculty members across both campuses. A good practice of the Sociology and Gender Studies Unit worth emulating is the practice of using PhD positions to facilitate research synergies across the wider department, targeting political sociology or politics and gender for instance.

As set out elsewhere in this report, there is a need for greater engagement with the work of the Risk and Crisis Research Center. This would bolster the work of the RCR (notably in quantitative research methodology), and it would facilitate the potential for wider research collaborations across the entire Department.

Strengths, Challenges, and Opportunities

Strengths

- The Unit has a dynamic new leadership with a vision for how it can develop and who should be supported in this role.
- The Unit is characterized by a young staff profile with energy and enthusiasm to revitalize political science at MIUN.

Challenges

- The fact that the Unit has so many young staff on temporary and/or teaching-focused contracts stymies efforts to raise the research profile of the Unit. This will need careful attention and management.
- Like Sociology, this Unit's faculty members are divided across the two campuses. This presents a challenge to developing research synergies.

Opportunities

- The expert panel recommends that the Unit carries out a fresh strategic review to take account of the different staff complement since the production of their self-assessment report.
- The Unit is now well placed to engage more proactively in the work of the RCR.
- Mentoring that is departmental-based to help nurture young staff and forge closer synergies across the department as a whole.
- Enhance and strengthen their "higher education seminars" to facilitate greater cohesion and promote greater research synergies between political science faculties on both campuses.



4.2.4 Research Field 4: Humanities

Faculty of Human Sciences

Experts: Prof. Katarzyna Marciniak, Prof. Gunnar Winsnes Knutsen, and Prof. Tomás Albaladejo Mayordomo.

General assessment

Overview:

On November 12 and 13, 2013, our Panel met with the representatives of the UoAs from the Department of Humanities: 1) History; 2) Swedish, Spanish, Religious Studies, Comparative Literature [further referred to as Unit no. 2—we want to stress, however, that these sections of the Humanities are not a real unit per se as they represent different areas of study and different disciplines. We created this phrase for the sake of this document]; and 3) English.

While History and English offered very positive and enthusiastic assessments of their work, future research possibilities, and a generally positive view of the University's management and organization, Unit No. 2 presented a much more pessimistic and contentious view of the organization of the University and their place within it. Specifically, Unit no. 2 made several concrete comments: a) lack of long-term planning in relation to research, teaching, and staffing from the University's management; b) lack of technical and administrative support after the centralization; c) lack of autonomy for the department that has caused competitiveness instead of collegiality; d) reduction of the democratic process due to the fact that decisions are no longer made at the department level; e) lack of vision for the University as a whole. These views were not shared by History or English. This disparity made our evaluation more complex and more difficult since we have received contradictory opinions about the functioning of the department.

History and English are the only two disciplines that offer PhD degrees and thus work with doctoral students. By comparison, Unit no. 2 has no doctoral component and, more than History and English, is devoted to lower-level teaching. So, while History and English can combine their teaching and research, the multiple disciplines within Unit no. 2 do not have such opportunities.

Quality of Research

Overall, all three UoAs produce high-quality research in relation to the resources allocated to them. The researchers publish first-rate work in well-known journals and presses, both in Sweden and internationally. Each unit publishes in accordance with the best practices in its field.

History: Excellent

We met with 2 faculty members, 1 postdoc and 2 PhD students.

History has produced very high quality research that frequently deserves wider circulation than it has obtained so far. The quality and originality of the research published in the period under assessment has impressed the panel, in particular, in military and political history. Nevertheless, history has a challenge in finding a wider audience for its works. This is not simply a reflection of the limitations of language, i.e. that the international interest for Swedish history is limited and that much research will by necessity have to be published in Swedish for a Swedish audience, but also that a number of books have not been reviewed in the major Swedish history journals. Some of the research published by this unit is of the highest quality and deserves wide international attention.

Unit no. 2: Swedish, Spanish, Comparative Literature, and Religious Studies: Very Good

We met with 4 faculty members, one from each discipline. The faculty members present stressed the fact that they are not a real unit within the department but they have been placed in one unit for the purposes of this evaluation.

The quality of research of Unit no. 2 is very good in general. It reveals that the researchers have a good knowledge of previous scholarship and the state of research in their fields. Their bibliographical information is excellent. The international visibility is better in the branches of the Unit that publish in languages known in other countries like English or Spanish. Overall, the research of Unit no. 2 compellingly contributes to the advancement of knowledge within the broad area that this Unit covers.

Comparative Literature: Research is broad and deep and it reflects: literary textual analysis, didactics, gender studies in children's books, the epics of Norrland, modernity and modernism in the poetry of the environment and the analysis of the combination of words and music in the opera.

Swedish: Research is also very good in regard to Swedish language. Place names and other branches of onomastics, lexical semantics from a cognitive perspective, and sociolinguistics and oral interaction as well as Swedish as second language are studied with very good results. While this work is of very high quality, its audience is necessarily limited and it cannot achieve a wide international attention.

Religious Studies: This unit produces original and specialized research which cannot be found at other universities. Furthermore, the translation of gnostic texts into Swedish and the comparative research of ancient Nordic religions are valuable additions to the field.

Spanish: Research in Spanish is also of great value because of the originality of the topics and the methodological perspectives adopted. The analysis of the combination of literature and history and its connection to the study of social and historical memory demonstrates high quality of this work.

English: Very Good

We met with 3 full-time faculty members from English and 4 doctoral students. The faculty represented 3 fields of study within English: a) Linguistics, b) Ecocriticism and American Literature, and c) Romani Studies (also referred to as Travellers' Studies).

While we found the submitted research to be of high quality, its majority offered for assessment was produced by faculty members who no longer work at Miun. Specifically, on the submitted list, more than half of the publications were produced by staff members who have left. However, the panel evaluated all the work submitted and found it to be original and cutting-edge.

Productivity

Our panel found all the units to have very good productivity.

Research Environment and Infrastructure

History (Very Good) and English (Very Good):

These are the largest and the only units within the department with doctoral students. Their research environment appears to have a positive and optimistic view of their own research possibilities and strengths. Additionally, both units appear to have an effective leadership. We recognize that History has demonstrated excellence in attracting external funding. However, the unit's gender profile needs to be rectified as currently all the tenured faculty members are male. We also found that while History has strong networks, English networks have been diminished when the unit lost 5 faculty members. However, in the area of interdisciplinary activities, both History and English are very active (Forestry, Eco Humanities, etc.).

Unit no. 2: Swedish, Spanish, Comparative Literature, Religious Studies (Insufficient):

The various sections within this UoA seem to various degrees to lack confidence in their ability to find resources to conduct research, attract external funding, and influence decisions that affect their work environment compared to English and History. We should also stress that Unit no. 2 wanted us to understand that they are not a homogenous group and that each discipline has its own challenges. For example, there are challenges in recruiting, staff retention, and internal collaboration.

None of the disciplines within Unit no. 2 has a doctoral program. Because of this, Unit no. 2 as a whole feels deprived, marginalized, and isolated. However, Comparative Literature seemed less pessimistic than Swedish, Spanish, and Religious Studies. Overall, the Unit has several ambitious researchers with international reputations who are not able to pursue their research effectively within this research environment.

Research Networks and Collaborations

All Units: Very Good.

All UoAs have very good networks and collaborations in relation to their relative size and resources.

Coproduction and external non-academic cooperation

All Units: Very Good.

All UoAs have strong relationships with other institutions and non-academic entities.

Impact on society

All Units: Very Good.

All of UoAs have presented impact cases that demonstrated international reach and significance to society.

Strategies and plans for development and renewal in the UoA

English and History (Excellent): Both disciplines have presented compelling visions and goals connected to concrete, realizable projects. Both have a good sense of their strengths and weaknesses and expressed a sense of excitement regarding their future developments.

Unit no. 2 (Very Good): All the strategies presented by the separate disciplines have been clearly and feasibly articulated. Much of what has been said about History and English can be said about Swedish, Spanish, Comparative Literature and Religious Studies.

It should be stressed that Unit no. 2 is aware of the need for a joint collaboration with the other Units of the Department, in addition to the collaboration between the different parts of Unit no. 2. However, the lack of PhD programs limits the possibilities for developing research and also activities for junior faculty. Therefore, this UoA is graded as very good instead of as excellent.

Recommendations for development

- A. If further resources become available, we recommend creating a more equitable research environment through establishing a PhD program for Spanish, Comparative Literature, Swedish Language and Literature, and Religious Studies. This would elevate these disciplines to the same level as History and English. We heard that, for example, Comparative Literature cannot be supported via a doctoral program without hurting either English or History. Of course, we do not recommend shifting resources from one discipline to another. This is our main recommendation because we saw a strong need to repair the low morale of Unit no 2 faculty and thus create more opportunities for their research development.

- B. We also recognized the need for a long-term predictability in distribution of research resources based on research results for those faculty members that consistently deliver. Having to constantly reapply for funding for ongoing research creates a sense of instability and vulnerability. This ongoing task of application writing and evaluation leads to unnecessary bureaucracy and paperwork that take time away from the actual research. We understand that the application process for research time is unavoidable. However, we recommend introducing the possibility of applying for longer periods up to 3 years based on performance in the previous period.
- C. We also recommend giving priority to those applications for research time and resources coming from faculty members who are close to achieving a promotion.
- D. We recommend a consideration of joint PhD supervisions between Miun and international universities as a way of improving the internationalization of research.
- E. Finally, entering in research agreements with international universities would offer outstanding opportunities for further internationalization of Miun research. For example, Professor Albaladejo can help promote an agreement for research with his own university. This would mean the following: that a faculty member from Madrid would be financed by his/her university and would come to Miun to be a part of the Humanities here for up to 3 months. Miun would agree to accept the incoming researcher and give him/her an office and access to facilities. In exchange, Miun would agree to finance a faculty member from the Humanities who would go to Madrid to research there for up to 3 months on the same conditions.
- F. As a further way to improve internationalization, we also recommend an establishment of visiting professorships.
- G. Finally, here are our more specific recommendations for each discipline:

For History we recommend:

- a) ensuring that the next tenured hire is a woman
- b) enlarging the PhD group by giving History five permanent PhD positions
- c) giving History two permanent postdoc positions

For English we recommend:

- a) enlarging the PhD group to five permanent PhD positions
- b) more research resources to distribute

For UoA 2 we recommend:

- a) more tenured staff
- b) establishment of doctoral programs for Spanish, Comparative Literature, Swedish Language and Literature, and Religious Studies

A more global recommendation:

The panel recognizes that our recommendations may not be easily implementable. Thus, to remedy the unevenness of doctoral programs within the Department of Humanities, we want to suggest a possibility of considering a Ph.D. in Cultural Studies as a potential solution. A degree in Cultural Studies would offer a possibility for different faculty members to work together across disciplines within the Humanities.

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4.2.5 Research Field 5: Behavioral Sciences

UoA 5.1 Social Work

Faculty of Human Sciences

Experts: Prof. Narda Razack, Prof. Liisa Keltikangas Järvinen and Prof. Joanne Hughes.

General assessment

Grade: Very Good

The Department of Social Work (DSW) adheres to the principles of human rights and social justice and is committed to eradicating injustices and marginality at the local, national and international level. These values influence the research objectives and activities of the department leading to the production of knowledge that focuses on social change. DSW is a relatively small unit with a broad range of research themes organized under six research areas. Three of these areas have well-developed projects and the track record of publications is very good. Other themes have fewer publications and could be further developed. The overall theme of research within this UoA is: 'Social Work and its late modern challenges.'

The Global inequalities, racism and structural discrimination theme has led to many projects dealing with inequality and power relations. Publications appear in a variety of international and European Journals which attract a global readership. Professor Kamali, the project lead, has established a team with DSW faculty, PhD students, national and international partners. This research has secured major funding from the European Union. Projects focus on the plight of immigrants, institutional racism and discrimination, all critical issues for a global society. The theory of Multiple Modernities is the focus of a text and journal articles and the research on democracy in Muslim countries is also of major research significance. Professor Kamali is the sole author of two books from this project, articles in international journals, reports and co-authorships. Other DSW researchers, including a PhD student, have respectable publications. The publications are of high quality and the outlook for future publications is promising.

Research in the theme **Emerging methods in social sciences and social work** includes collaboration with a wide range of national and international scholars and research centres. Of particular significance is the Network for Reflexive Academic Writing Methodologies (RAW), which has over 240 international members. Some of the projects include the press, Swedish film and TV, leading to scholarly work on discourse and narrative methods. Professor Livholts, the area lead, has been a guest researcher at Stockholm University where she developed and conducted research on Alcohol and Drugs. Publications are quite good with an edited book and articles in journals which attract international readership. Future outlook for this research

theme is extremely promising.

There is also very good evidence of research strength and capacity in **Health and Social Work on Child and Adolescent, Homelessness and Addiction** led by three professors. These themes are critical areas for social work research and there are collaborators at the provincial, national and international level. Publications are listed in several international journals. There is potential for greater research capacity as the themes are of major significance for many in society.

Aging, welfare state and society theme consists of two projects. The first relates to ethnicity, gender and relationship among the elderly and the other theme on aging and the quality of life for the elderly. Although publications are limited, two articles are published in leading journals in the area. Another theme, **Indigenous People and Social Work** have two committed faculty whose research include the Sami people in Sweden and international collaboration with the Mapuche community in Chile. One of the faculty members, Professor Calbucura, sits on the advisory committee for the UN council of indigenous people. The rights of Indigenous have political implications and the university could provide the infrastructure for this research. Publications could be strengthened.

Transformation of social relations and the need for support is concerned with recent changes in the Swedish welfare state which is of significance to the well-being of families. Themes emerging include the social dimensions of financial support, personal relationships with people living with poverty and less conventional types of family construction. Two publications are in well-respected journals with a PhD thesis on elderly women and men living apart. The last research area relates to sport and physical activities for addicts. However, there is no indication of publications which could indicate early stages of research.

The assessment team recognized the strengths of two major research themes: Globalization and Emerging Methods. Both projects include local, national and international collaborators. Health and related themes have great potential for research and there could be synergy with psychology in the area of sports and addictions. The bulk of the publications and research of the UoA rests with two to three professors. The faculty is to be commended for promoting PhD students. One in particular has published two articles in leading social work journals and her work has been used to develop themes for the upcoming International Social Work conference in Australia.

Community collaboration is a critical component for social work research and community engaged scholarship needs to be encouraged and given credibility. DSW collaborates with the community on a number of projects: aging, addiction and homelessness. Major reports and other forms of dissemination should be reviewed for its impact and considered as professional contribution. There is some evidence of a vibrant research culture and the PhD seminars provide a platform for critical discussion.

Despite the successful publications coming from many projects (two projects can qualify as excellent), the quality and quantity of research output is on a downward trajectory (measured by share of research council funding, externally generated research funding, doctoral awards in recent years, publications in quality peer reviewed outlets and citations). There is clearly a need to focus on developing capacity and building a research environment that is conducive to improving the quality and quantity of research output.

Quality of the research

Grade: Good

A significant number of the publications including sole authored books are published with leading publishers and articles appear in prestigious social work journals, attesting to the quality and substance of the research. Three research areas have strong local and international visibility and will most likely continue to produce significant research and publication. International and intercultural education leads the field in Sweden and has an international presence. The research on Globalization has yielded various projects which examined methods and practice perspectives of responses to increased immigration in Sweden. Research and publications in the area of homelessness, addiction including rehabilitation are quite strong with international collaborators within academia and organizations. The third research area: Emerging Methods in Social Sciences and Social Work: (RAW) and the pan-European Project, 'The European Dilemma: Institutional Patterns and Politics' have made enormous contributions to the research agenda of the department. The research is cutting edge and the publications are solid.

Productivity

Grade: Good

The majority of research output range from 'excellent' to 'fair' with the bulk being produced by less than 1/3 of research staff and involve the first three projects. Publications appear in top tier journals which attract a global readership: British Journal of Social Work; International Social Work. Health and social work have the highest citations and demands but publications have halted. A number of active research projects are not translating data generating into published work (p.16). The themes of the units reflect the core areas in all schools of social work where knowledge production and scholarship are needed for pedagogy', especially as it relates to the local context. Many other research areas have the potential to develop and become more advanced with staff support and funding. The research topics and publications topics within the UoA are relevant to the issues facing social work on a global scale with the potential for further reach especially in North America and other parts of the world. More peer reviewed papers, conference participation and

seminars and speakers at the university are needed to improve the research profile.

Articles listed in the self-assessment indicate 19 in the Web of Science with 20 citations. Bibliometrics and Web of Science historically do not fully recognize the social sciences and humanities disciplines because there is not a core set of established journals and the range of theoretical influences and research fields is enormous which reduces citations. Given these barriers, DSW's statistics are fair with potential to be increased. 45 peer reviewed articles and 45 book chapters indicate good overall productivity. However, there is a decline over the years and significant attention to productivity for the entire department is needed. It is difficult to provide an accurate assessment since the document lists publications under a variety of headings. Few texts and publications in two particular research units boost the overall production in the department. As stated in the assessment, two scholars have significantly more publications and DSW needs to discuss ways to facilitate scholarship and knowledge production in other areas. Generally publications including books, peer reviewed journal articles, book chapters and conference papers are modest. Attention is needed to research output as there is a downward trend and therefore engagement as a unit to identify strategies should be encouraged.

Research environment and infrastructure

Grade: Good

DSW will soon have three Professors who generate most of the funded research and publications. We were apprised of an upcoming staff meeting to discuss and formulate the direction for ongoing and future research. The staff complement is small and recruitment of key staff to focus on cutting edge research is needed. Seminars held with faculty and PhD students appear to be well-organized and developed. Participation in such seminars leads to broader understandings of the department's research and knowledge production. DSW collaborates with the community which results in research projects which in their turn influence pedagogy and practice.

Based on the unit assessment and our discussion, there is a need to improve the research infrastructure to boost productivity and capacity for all staff. The fact that social work is a relatively new and niche research sector is cited as problematic as it promotes 'passive consumption of theory development in other disciplines'; 'an overemphasis on social work as a vocational training', and; 'application of traditional methods and approaches'. It is not clear why these issues are regarded as problematic as they could equally be presented as strengths for infrastructure given that social work is an academic discipline that bridges community and practice.

Research networks and collaborations

Grade: Good

Two units: “Globalization, inequalities, racism and structural discrimination”, and “Emerging Methods in Social Science and Social Work” have a substantive international profile and Health is increasing its international agenda. All of the research units list partners locally, nationally and internationally. Research on Academic Writing Methodologies has succeeded in creating international networks and could be a leading example for further development in DSW. More grants need to be developed and submitted. The area of Field Education is integral to Social Work and the department held a conference which included community participation leading to publication. DSW could develop networks and seminars with local experts and invite other leading experts to help to raise the profile of the UoA and to build on existing research strengths.

Co-production with external partners, Collaborations with non-academic partners

Grade: Insufficient. Although there is evidence of collaboration on all levels and the capacity for further development the unit needs to seek support from the administration in order to have administrative staff to support the development of projects.

There is significant evidence of engagement with society, and it is clear that researchers have ties with national and international stakeholders and academics. There is evidence of external collaborations with national and international advisory boards and bodies, but it not clear how this enhances research within the Department, as it seems that much of this activity is undertaken by individuals who are already research active and producing high quality publications. Five community collaborators are listed in one research area. However, the extent of these collaborations is not featured in the assessment.

It is imperative for social work research to involve community networks for pedagogy and practice. Partnering and engaging with the community/agencies on research projects focusing on social issues will lead to policy analysis, practice, pedagogy and responses to human rights and social justice issues.

Impact

Grade: Insufficient. Although we understand the challenges to measure impact of social work research we agree that more effort is needed to define the impact of research activity in the department. We suggest that DSW seeks to include evaluations in their seminars and conferences and pay attention to the impact on policy, pedagogy and practice on a local, national and global scale.

Two major projects show evidence of impact on society with political and societal

responses leading to substantial publication. Both projects were profiled significantly within the community, political platforms and media. In addition, the PhD student has published two articles in an international journal and her work has influenced the theme for the bi-annual international social work conference. The Indigenous project has begun to raise critical questions relating to Aboriginal people in different contexts and has the potential for impact on policy and practice. If we were to consider impact as including an audit trail from research to policy and practice interventions, it would be more clearly demonstrated in only two projects. In addition, the way in which impact is described in the unit, assessment could be confusing. For example in one area (p.17) books and publications are cited as representing impact, and elsewhere collaboration with stakeholders is represented as impact (pp.16-17). However, we agree that books and other publications and also collaboration with stakeholders are core to social work research as collaboration with the community is integral to producing knowledge around current local issues. While understanding that social work research cannot so easily be quantified, more attention is needed to reflect evidence of changes in attitudes and behaviours (research outcomes) that can be clearly linked to research outputs. This small department attracts international students and has organized study abroad for many students. There is also internal funding to host an international student. These efforts already will undoubtedly continue to have an impact on the department, the university, the community locally, nationally and globally.

Strategies and plans for development and renewal in the Unit of Assessment

Recommendations for development

1. **We recommend that the unit works collectively to develop a strategic vision and plan for research development and implementation with a time frame and annual reviews.** In this vision efforts should be made to engage all faculty members in projects so that their publication record can be improved. The plan should describe the support needed to produce funding proposals in order to improve publications.
2. **We also recommend that some themes be merged for greater collaboration and productivity.** Health and Social can be a main theme as well as Aging in Society.
3. **We recommend that the department could heighten its profile within the university with more cross unit collaboration.** Collaboration with Psychology and Health will strengthen fields on health and addictions as Social Work can bring unique perspectives to other disciplines.

4. **We strongly recommend that a Research Centre on International and Intercultural Research be developed ideally within the University and definitely within the Department to highlight and promote projects and to seek major funds.** These themes are core to internationalizing research in an era of globalization and transnationalism. Such a research unit will provide a strong brand for Mid Sweden University, nationally and internationally. Given the focus on internationalizing higher education within major universities around the world, DSW has already achieved significance in this area and can help to build the infrastructure at Miun. This UoA is innovative and the research is solid and potential exists for the unit to develop an integral approach to structural discrimination, globalization and social inclusion for the university.
5. **We recommend that DSW invites key scholars for short term visits to collaborate on research projects with faculty and hold public seminars to raise the profile internally and in the community.** There is a broad range of research topics to attract scholars on a regular basis to engage with staff, students and other members of the university and community.
6. **We recommend that the disbursement of funds be reviewed with the view to providing funding course release to junior faculty to promote their research.**
7. **We recommend that the department liaise with senior management to leverage their successes in key project (e.g. structural discrimination and immigrants) which are of critical importance in universities.** The political and sensitive nature of topics including working with indigenous people, immigrants, and issues relating to structural discrimination should be promoted and supported by the higher administration.
8. **We recommend that DSW increases its efforts to engage the community** by putting on seminars, working closely with agencies and practitioners to be aware of key issues in the community to be able to respond with research and consultation.
9. **We recommend that senior faculty members make time to mentor other faculty to develop broader networks and international collaboration.**
10. **We recommend that the PhD program be further developed.** While there are a significant number of PhD students, greater effort is needed to recruit on a broader scale to attract international scholars.

11. **We recommend that faculty members attend major conferences; seminars; hold a bi-annual conference which could attract international participation.** The research themes are of critical global importance which could attract students from a variety of sectors.

UoA 5.2 Psychology

Faculty of Human Sciences

Experts: Prof. Narda Razack, Prof. Liisa Keltikangas Järvinen and Prof. Joanne Hughes.

General assessment

Grade: Very Good

The discipline of psychology was officially recognized in 2006. Given the relatively short history of the Unit, progress has been impressive.

Recently, the research has been categorized under four headings: clinical psychology, emotion and cognition, developmental psychology, and work and industrial psychology.

The Clinical Psychology theme includes research activity in a broad range of related areas that are sub-categorized under health psychology and psychopathology. Research projects in clinical psychology are reflective of internationally important issues. For example, the research on coronary heart disease, type-two diabetes and depression, which are the main health problems of the Western world, is of global significance.

The track record of publication within clinical psychology is generally good, and there has been a relative increase in the quality and quantity of publications in this area. International networks are very wide and relevant, and national collaboration with other academics is high. These characteristics suggest that the outlook for research in clinical psychology is very promising.

Research highlighted under the category of development psychology includes work in prenatal factors relevant to an infant's development. This research is very relevant internationally, and it is undertaken in collaboration with an international network - facilitating access to large international datasets. Although the UoA associated researchers are not leading this research, their participation in it means that the UoA is able to claim internationally significant publications that are located in some of the most prestigious journals (as measured by citation and impact factors). In our view, the work in this area is promising and enhances the overall profile of the UoA. The fact that this work is not led by Miun is not an issue of concern, as the staff member involved is gaining experience and recognition that in the longer term can contribute to the development of the UoA.

Research in industrial and social psychology is relatively narrow with limited evidence of publication output. One of the difficulties with this theme is that for the most part, it reflects the work of less experienced staff members, and there is no senior academic, with a strong publication record who is driving a coherent research programme.

Emotion and cognition is an umbrella category for the location of a broad range

of projects, many of which are still in early stages of development. Amongst these projects, those relating to abuse against the elderly and fear and anxiety are exceptional in terms of research output. However, it is not clear that all projects within this category have the potential to deliver, and there is some suggestion that publication potential may be aspiration rather than achievable in some cases. The UoA may wish to consider its strategy with regard to ongoing support for research activity that does not show potential for delivering research output.

In our view, the stress and anxiety theme is limited by its location under emotion and cognition, as the theme is overarching and connects much of the best work within the UoA. Repackaging the profile of the UoA to focus on stress and anxiety as a connecting theme could provide a more coherent formulation of the best quality work in the unit. Hence, for example, assessing autonomic nervous system reactivity both during experimentally induced stress, and in everyday life offers one way of exploring the mechanisms underlying coronary heart disease and type-two diabetes.

At present, there is some imbalance of productivity between the research staff in the unit and between staff at similar grades. Hence, less than 50% of staff members produce the majority of papers listed in the self-assessment.

The national networks of the unit are extensive and effective. International collaboration and relationships with other universities are ongoing and extensive. There is also evidence of some promising work in the areas of sports psychology and language development. However, this work is undertaken by junior members of staff and there is no clear infrastructure of support for it.

Quality of research

Grade: there is some evidence of excellence in publication output and generally the standard amongst those publishing is good or very good. However, publication output from some is insufficient relative to seniority, and there is a question regarding the expectation of publication amongst staff whose contracts offer limited space and time for research activity. Taking account of the above, we would rate research quality as very good.

Research quality is not consistent under all research themes and there are some significant discrepancies. In our view, health psychology represents a strong theme that meets international standards. The publication record for this theme is also good. Psychopathology, too, has several themes that have generated international interest.

Impact factors for international peer reviewed publications range from 0.51 to 6.45. This implies a strong international profile for some work. The article focusing on stress intervention in women with coronary heart disease is the top ranking output. Citation indices of the articles of Clinical psychology are generally good, and some of them are remarkably high. Of particular note, are the citations for the papers authored by Mörtberg et al in *Acta Psychiatrica Scandinavica* (i.e. 60), Lisspers

et al in *Health Psychology* (i.e. 48, to be published 2005, i.e. before the evaluation period), and Sundin et al. in *International Journal of Nursing studies* (i.e. 26). These citations indicate an even higher international reputation than the impact factors for the outlets they are in suggest. Based on the bibliometric information available, researchers producing work that is of an internationally recognized standard include Rodrigues; Sundin; Lisspers and Wasteson. Thomten also has a strong profile, and there is some evidence of quality in the publication output of Zakrisson.

Productivity

Grade: Very good

Productivity is generally good. The track record of the Clinical psychology branch is promising and shows good progress. Developmental psychology has had some impact at international level with a number of publications in high-quality journals – Whilst, this should be understood in the in context of rather peripheral engagement in the projects on which the publications are based, engagement at this level offers promise for the future.

Regarding the other two themes, an increase in productivity might be required. This is especially true with some projects inside the “Emotion and Cognition” branch. The outcomes of fear, anxiety, and stress projects are documented, while there are other themes with rather tentative outcomes.

Industrial and social psychology is a small branch that has resulted in some international documents.

There are a healthy number of PhD studentships, and the Unit has been very effective in the internal promotion of doctorates. Of the current profile of 9 PhDs, 8 are former lecturers or technicians. This suggests a strong research environment and a focus on capacity building.

Research Environment and Infrastructure

Grade: Although the UoA shows commitment to capacity building, in the absence of institutional support this is unlikely to be realized. Our grade of the infrastructure is therefore, ‘insufficient’, though it should be recognized that this is more a reflection of the limited resource commitment on the part of the institution.

The staff profile in the Department comprises a proportionate range of senior and more junior staff, and research activity is broadly commensurate, with the more senior staff leading and generating more research projects and outputs than less experienced colleagues.

There has been a significant and rapid expansion of the Department since 2007 and in the review period staff numbers increased from 15 (2007) to 31 (2012). This is due to the success of the Clinical Psychology Programme which commenced in

2008. Although there has been a rapid increase in FTEs, it remains the case that the majority of research activity is undertaken by a relatively small number of staff. The senior staff members in the Department play an effective role in research leadership with the Head of Department role rotated between the professors on a three year cycle. The professors also initiate the majority of research projects, and these help to develop the capacity of less experienced research staff.

In terms of infrastructure, there are a number of positive activities that are likely to enhance the quality and quantity of research activity and output. These are as follows: A comprehensive seminar programme; regular monitoring of PhD students; structured methods training; a workload allocation model which ensures that each member of the main thematic groups has dedicated time for research; target-setting for research active staff – for example, there is an expectation that, relative to internal funding awarded, all research groups will make at least one funding application per year; a ‘Journal Club’ dedicated to examining and discussing methodological issues and journal papers; a well-resourced laboratory (currently underused); and the development of online platforms for research, data collection and dissemination. Despite these strengths, some factors identified are likely to inhibit the development of research potential. The majority of the staff members has high teaching loads, and with the exception of professors, has to depend on external funding for research. Whilst it is the norm in research intensive universities that the proportion of time a research active member of staff can devote to research activity is commensurate with external income generated, the rationale for using internal funding to free up professor time in the UoA is not clear. Indeed, it could be argued that such funding should be allocated to help less experienced staff member leverage external grant income. Relatively few staff members undertake most of the research work, and there are some concerns regarding the demographic of the most research active staff. Although there is a regular trickle of younger staff gaining PhDs, the current profile, taken together with high teaching loads is likely to limit potential for research growth in the next few years. Taking account of this, the UoA is focusing research efforts on consolidation of existing strengths, as opposed to developing new research strands. This seems like a sensible strategy in the circumstances. However, as the effort invested in the development of the clinical psychology programme nears an end (the first tranche of students complete their course in spring), and the burden of course development eases, staff may be able to invest more time in new research activity.

The low level of institutional support is noted as a barrier to competing for international grants. Such support typically involves the financial management of research grants; regular liaison with funding bodies; the dissemination of research relevant information, including current grant award bodies and deadlines for the submission of research applications; review of grant application to ensure compliance with the regulations of the awarding body. The existence of such support for the psychology UoA could lead to increased funding proposals and applications.

Despite limited administrative support, a considerable number of grant applications have been submitted. However, in relative terms, the success rate is low. This is attributed to the fact that the UoA is often in competition with more internationally recognized institutions. This is a perennial problem, particularly for regional universities. The following practices can help:

- Creating and/or participating in networks or forums that include leading experts in the field with a view to developing consortiums and collaborative research projects.
- Inviting colleagues from the main grant awarding bodies to deliver workshops on their grant schemes, including how to apply and the peer review process.
- Dissemination of 'model' successful applications for different grant award bodies – where these are not available internally, connecting with colleagues in other institutions who have been successful could be useful. Seminars/workshops by successful awardees to describe the application process.
- Focusing collective effort on the development of a smaller number of strong bids – this could help minimize the submission of weaker proposals and might generate more success in the longer term.
- Internal Peer review – colleagues from within the UoA could undertake to read applications for quality assurance.
- External peer review – trusted colleagues with a track record of successful applications in the field could be employed to peer review applications. Some remuneration could enhance the potential for willingness amongst busy academics to undertake external peer review.

Networks and collaborations

Grade: There is some evidence of excellence and very good collaboration, but this is limited to the activity of only a few individuals. Taking account of this, we rate the overall grade as good.

There is substantial evidence of networking and collaboration within the UoA. Of particular note, in each of the key research areas there are several projects that involve national and international collaborations with world recognized research institutions. Some staff members also have an international profile – evidenced by journal editorship; PhD examiners for other leading institutions; international peer review and membership of national and international councils. There is also evidence of healthy national and international dissemination activity, with some staff members regularly presenting at national and international conferences and meetings and spending extended periods away from the unit.

However, the report narrative suggests that much of the international research

activity is undertaken by a relatively small number of staff, highlighting the need to ensure ongoing capacity –building work. Possibilities to consider include the following:

- Strategic use of internal research money to ensure that less experienced staff members are active in national and international networking. This might involve supporting colleagues to present findings from PhD research at meetings organized for PGR or post-graduate students.
- Co-authorship of papers internally where more senior colleagues take the lead and ‘nurse’ more junior colleagues through the writing and presentation process.
- Support for workshops that address issues such as: how to become a journal editor or peer reviewer; the value of networking and how to engage in it.

Coproduction and external cooperation

Grade: There is some evidence of excellence and very good collaboration, but this is limited to the activity of only a few individuals. Taking account of this, we rate the overall grade as good.

As noted above, there is significant external collaboration, and this has led to the co-production of some research outputs that are of significant research quality. Often these are published in leading journals and some have been regularly cited. However, as before, a relatively small number of staff members are responsible for the work that has gained most significance internationally.

Impact

Grade: Some evidence of excellent and very good impact but societal impact is limited to just a few projects. Given the applied potential of much of the work in this unit, this is a little disappointing. Our overall grade is therefore ‘insufficient’

A number of research projects are undertaken in collaboration with primary, secondary and tertiary treatment facilities (mainly hospitals) and care centers and there is some evidence of research activity in this UoA having some impact. For example, the research work relating to cardio vascular disease has led to changes in how cardiac units advise on health care. Also, the results of the PTSD project have led to changes in how the Stockholm transport sector manages employees who witness fatalities. However, the self-assessment document does not adequately disentangle impact and dissemination. Indeed, much of what is cited as impact relates to publicity and engagement, as opposed to policy and practice shifts that will impact the lives of individuals or groups. A more direct audit trail is needed in order to adequately assess the extent to which the UoA is having an impact.

Strategies and plans for the development of the Unit

Grade: Insufficient

There is very limited information on strategy for development of the unit. The main reference is to the consolidation of research activity within the current thematic profiles. Some other aspirations are noted, including the aim to better integrate knowledge and laboratory skills, and a wish to see an alternative approach to the allocation of staff and resources.

Recommendations

1. **We recommend the UoA should consider repackaging research clusters to better reflect core research strengths.** We recommend an overarching theme relating to anxiety, stress and fear could connect some of the best quality research in the UoA and offer an opportunity for the Unit to brand itself as a centre of excellence in this area. Health psychology is also an overarching alternative theme and it is conceivable that embryonic research in sports psychology and or language development might be included more easily under such a broad generic theme.
2. One mechanism for profiling the best research connected to the stress theme is the establishment of a research center. **We recommend that consideration is given to the establishment of such a center within the UoA.** We believe such a center could significantly enhance the profile of the work and the potential to generate external research income.
3. If such a centre is developed, **we recommend the appointment of an international advisory board comprising world-leading researchers in the field.** This will both enhance the profile of the UoA and offer opportunities for collaboration.
4. **We recommend that the he process for disbursement of research funding is reviewed.** At present, professorial staff members are the main beneficiaries, and there are limited resources for supporting less experienced staff. This situation is detrimental to capacity building and limits the opportunity for sustainability of research, particularly where there is a significant age gap between the most senior professors and less experienced colleagues.
5. **We recommend that each senior staff meet with each individual within the UoA to discuss research plans and targets for the coming years.** These plans should be commensurate with status and allocated time for research. It is unreasonable to expect individuals to deliver research targets where they are on full time teaching contracts. Hence, we recommend strategic

use of resources to ensure the capacity building for research in core strength areas.

6. The UoA has a strong track record of PhD studentships; however, there is presently some dissonance between the research interests of PhD students and their supervisors. **We recommend that in future PhDs are supported only in areas that relate to the core research strengths of the UoA, and where there is more than one possible supervisor** (to mitigate against the possibility of one core staff member leaving).
7. The psychology lab is a considerable asset to the UoA and if the core research areas are to be sustainable, the resources necessary for maintain the lab will be required. **In the short term, and in the absence of other funds, we recommend that the university provides funding support for the lab.** In the longer term the Unit must demonstrate how the lab can become self-sustaining.
8. One possible income generating strand activity relates to intervention and treatment work. **We recommend the UoA undertake a review of the potential for the lab to be used for income generation activity.** For example, might the lab become a research and treatment facility? Could other health care providers avail (and pay for) access to lab equipment? Innovative thinking will be needed to maximize the potential for exploiting the commercial value of the excellent resources that exist.
9. The research strategy for the UoA is currently underdeveloped and it represented broadly as a desire to consolidate research activity into fewer and more focused areas. We agree that this objective is consistent with the future sustainability of the UoA. However, **we also recommend that the Unit develops a comprehensive 5 year strategy that includes a vision, mission statement and operational plan.** This strategy should reflect institutional research objectives and should include a series of measurable research objectives.
10. The current web profile of the UoA is very poor. As the web presence is the main portal through which others will seek information about the UoA, it is imperative that the site is up-to-date and attractive. **We recommend that resources are invested in creating a dynamic website (s) that seeks to promote the research work within the UoAs.** There are many examples of good practice that can be accessed to model the site. It might also be worth considering involving an advertising or branding agency to undertake this work in collaboration with UoA staff.

11. Some current innovations within the UoA may have a commercial value, including the web-based platforms for data collection and exchange, and the development of treatment APs. **We recommend that the UoA works together with skilled colleagues at university level to explore the potential for income generation.** If such potential exists; there will be a clear requirement for relevant institutional support to drive the initiatives.

UoA 5.3 Education
Faculty of Human Sciences

The summary and the report have been omitted due to a delay in the evaluation process.



4.2.6 Research Field 6: Media and Communications

UoA 6.1 Centre for Study of Democracy and Communication (DEMICOM)
Faculty of Science Technology and Media

Experts: Prof. Katrin Voltmer, Prof. George Bohoris, Prof. Risto Kunelius
and Prof. Julie McLeod.

General assessment

DEMICOM is the first research centre established in Sundsvall, originating from a donation based civil society think tank. It was integrated into the Miun and the Department of Media and Communication in 2005. This long tradition and the distinct emphasis on democracy as a perspective of research on media has had a strong impact on the UoA, and it still continues.

The UoA is organized into four research groups (Political Communication, Journalism, Media Development and Organizational Communication), led by professors. The output and profile of the UoA (partly because of its history) is still somewhat dominated by political communication and journalism research, but organizational communication and media development seem to be getting stronger and have developed a sustainable research portfolio. The Evaluation Panel thinks that the UoA is well integrated internally and that –since research questions usually will cut across the research groups - the research group division is not an obstacle to scientific innovation inside the UoA. The division can also be seen as a functional link to education programmes and to societal networks outside the UoA.

The publication output of the UoA is of high-end quality and quantitative productivity is excellent. This goes both for international and national publications. The leading researchers of the UoA are internationally well recognized figures in their specific sub-fields (especially political communication and journalism). Nationally, the UoA seems to have a scientific role that is bigger than its size and resources would anticipate. The societal relevance of significant parts of the research activities of the UoA is extremely well recognized on the national level, and general impact on society thus is clear. Local and regional impact of the department seems to function mainly through educational activities (which is not a minus in itself).

The UoA has a strategic horizon and action plan. In the organizational context of Miun this focuses largely on the Centre's role within the faculty, while larger issues related to universities and the challenges emerging from their changing environment play a minor role in the strategic planning of the UoA. With regard to developing the research agenda of the Centre, the strategic vision of the Self-Assessment report is less articulated. However, discussions during the visit quickly brought up awareness of the emerging themes related to the media industry and

democratic institutions and practices, but these are less well reflected in the current strategic vision outlined in the Self-Assessment Report. The Evaluation Panel feels that a strategic vision based on substantial research themes can help the UoA flourish even more in the Miun-context. They could be a bridge to cross the faculty and departmental boundaries more effectively and could be instrumental to strengthen both the national and international profile and relevance of the research conducted by the centre.

Quality of research

Grade: Excellent

Visibility in the research community: The UoA enjoys a very good international reputation. This holds in particular for the Political Communication group where leading scholars are well networked, hold some noteworthy positions in the international research community and have published in the top journals of the field. Members of the UoA have co-authored with scholars from some of the top institutions globally. The Evaluation Panel feels that this internationalized culture of publications and academic activity characterizes the whole research culture in an exemplary fashion. Nationally, UoA researchers hold a strong position too. Their work is widely used in university education and some of it is recognized as reference literature in the respective field.

Theoretical, thematic and methodological issues: DEMICOM researchers are strong in some core areas of their discipline and have made noteworthy contributions to a range of traditional research themes (e.g. election campaigns and political marketing, media effects research, regulation of public service broadcasting) as well as emerging themes and conceptualizations (e.g. “mediatization” debates, communicative leadership and current policy debates in media development). Recently, research into crisis communication has been added to the thematic agenda of the UoA. The centre has also moved into the study of photo journalism, further supported by a new professorial appointment, thus opening up new avenues of investigation. Thematically, the Evaluation Panel notes that the UoA focuses primarily on rather established issues of democracy, mainly in a somewhat media-centric manner. During the meeting, the researchers engaged in an inspiring discussion on emerging themes related to new forms of democratic participation and the changing nature of the “political”. However, these have yet to be incorporated into the research activities and outputs of the centre.

Methodologically, the work in the UoA is of high quality and rigorous, using well tested and accepted standardized solutions. While this is admirable and also a key part of the success in international publication, it can also sometimes limit the scientific innovativeness, particularly in times of rapid social and technological change. Particularly noteworthy is the UoA’s focus on comparative research.

Publication forums: Research outputs are published in a broad range of different

channels, varying from peer-reviewed top journal format to edited volumes (often comparative) to rather descriptive research reports. The UoA publishes its work in well regarded international forums, some of the journals are at the highest level in their fields (and these are not only narrowly specific outlets), the majority of them are very good. Scientific impact figures collected for the evaluation show good relevance (see table 2.2.3). The Evaluation Panel was pleased to note that the UoA team had a conscious policy of publishing their results also in Swedish, and that these publications were not merely replicas of the international outputs, but specifically written for the national audiences. The Evaluation Panel recognizes that the ability to continue these two publication streams successfully is a demanding task and a sign of high quality of the UoA.

Quality culture: It is noteworthy that the UoA's publications output is based on an articulated and strategically consistent publication culture, where the international peer-reviewed forums, well-chosen international conference attendance, culture of co-authoring, parallel national and international publication streams and practices of internal peer review all contribute to the high quality of the work.

At present, the quality of the research output of DEMICOM are judged at the borderline of "very good" and "excellent", but the Evaluation Panel concludes that overall, the quality of research output deserves to be rated "excellent".

Productivity

Grade: Excellent

Overall productivity: The overall productivity of the UoA is excellent. The major part of it is journal articles, and book chapters and peer reviewed conference papers figure prominently. The balance between articles, papers and books seems healthy. The publication figures are steady during the evaluation period, with one year (in terms of journal articles) peaking above this. Different ways of counting the productivity numbers offer support to the conclusion that the staff is very committed to publishing their work, and that this commitment goes beyond contractual time officially allocated to research. The productivity rate in 2011-2012 provided in the assessment report shows an excellent rate of 7 publications/FTE. (Table 2.2.6) Even though the Evaluation Panel had the impression that some of the bibliometric data provided lacked sufficient reliability, different formulas to calculate productivity from the data pointed into the same direction of an excellent productivity level. In addition to international output, the UoA has produced a steady flow of introductory textbooks in Swedish and well packaged research reports on project results. Publication activity has been somewhat concentrated on the leading researchers, but recent years show healthy signs of the burden and merits becoming more widely distributed across junior as well as senior researchers. (Table 2.2.4., Share of publication by the three most active authors down from 0,73 to 0,57 during the period)

PhD work: The UoA has clearly more PhD supervision potential than its current

numbers suggest. The amount of doctorates awarded during the evaluation period is low (3, or 0.6 per supervising academic staff during the whole period). The Evaluation Panel thinks that in an established research centre like DEMICOM this figure could be significantly higher. However, the number of PhD students seems to be restricted by factors that lie partly outside the scope of influence for the UoA. The low amount of faculty funded PhD positions and the challenges of securing external funding for doctorates effectively constrain this. The number of doctorates funded by external partners is currently 4 (Table 3.2.1.) and faculty positions 7 (Table 1.1.2). This suggests that there is a – even without increase in intake – good chance of increasing this productivity figure in the near future. The Evaluation Panel believes though, that with the current cast of professors, the UoA could still attract more high quality PhD students, including foreign ones, if the bottlenecks of funding could be solved. This would, of course, mean that the current culture of seeing PhD education mainly as a way of reproducing the own academic staff of the institution should be revised.

Promotions: The number of internal promotions during the period is low, only one. This is, however, not, in the view of the Evaluation Panel, a key indicator of productivity.

Research environment and infrastructure

Grade: Very good

Core structure and leadership: As an established research center, the UoA offers a very good research environment for its staff. The UoA enjoys a stable and clearly independent position in the department, but is not isolated from teaching and student population. The UoA has a clear leadership, and its key professors serve actively in different internal Miun bodies and committees. Within the centre, there is a recognizable and systematically developed strategy and culture, consisting of both effective management and academic leadership and discussion, as indicated in regular seminars and peer review practices. The four research groups seem to work well together, joining forces in various kinds of research projects. Indeed, the Evaluation Panel also raised the question of how much such sub-divisions are needed at all. However, the current structure does not seem to considerably hinder interaction internally and might even help to maintain intellectual diversity internally and recognizable profiling externally.

Interdisciplinary reach: The Self-Assessment Report describes intensive initiatives and “close cooperation” with other academic departments and disciplines inside Miun. There is an “aim” to find a common platform on which to develop research applications, papers, and PhD courses, but no clear vision of this as of yet. The Evaluation Panel also inquired about cooperation across departmental and faculty lines and became convinced that there are many project level initiatives and seminar practices that open the UoA’s work to interaction with other disciplines. When

probed during our visit, these activities and their usefulness were well articulated, showing to be a part of a research infrastructure, even though they were not explicitly outlined in the Self Assessment Report.

The staff structure of the UoA is fairly balanced, perhaps top-heavy (although professors are a crucial resource in today's research funding activities) and a relatively low number of assistant and associate professors. In the SA report and interviews, the UoA expressed the risks that losing a leading professor might have to the whole unit. Given the high profile of some authors this is understandable, but the Evaluation Panel's view is that the UoA is strong and established enough to be able to compensate for such losses and continue successfully.

Outreach: The researchers in the UoA are involved in continuous activities to disseminate their expertise and research results. This includes giving public speeches, acting as experts in the public sphere (through media), being involved in professional forums and engaging in communicating research results to a wider, non-academic audience. The statistical material (Table 3.2.3) suggests a considerable number and diversity of collaboration partners.

External funding: The UoA is able to attract a considerable amount of external funding, and the trend in this respect is good. 2011 was the best year so far and 2012 came close to that. The ratio between external funding and research-designated internal (faculty) funding is good (40:60) which is promising, given the current modes of external funding (where co-funded schemes usually vary from 40:60 to 20:80 deals). At the moment, there are no EU funded grants, explained by the fact that EU structural development funds cannot be easily translated to the sector the UoA is involved in. Proposals for EU framework funding have not been successful so far.

Infrastructure: In the Self Assessment Report, the UoA had decided not to elaborate on questions related to infrastructure (3.3.), innovation activities (4.3.) and external collaborations and contributions (4.2.). While this information is mostly available in the SA-report elsewhere, this omission suggests that the UoA has not fully articulated its (in itself very good) research infrastructure and needs related to that. However, topics related to these issues were covered during the site visit, and the Evaluation Panel notes that the wide scope of international collaborations of the UoA naturally supports the research infrastructure, opening opportunities and contacts for intellectual interchange and comparative project initiatives.

Research networks and collaborations

Grade: Excellent

The international research networks of the UoA are very good and partly clearly excellent. Some professors are in leading positions in their respective fields and associations, and other staff is active too. Top level networks are evidenced by co-authored publications, and the numbers of collaborations (Table 1.3.1.) are

high. Also, the average number of countries in publications (1,42) testifies of well-functioning networks that are part of the productivity. Building on existing networks of collaboration, DEMICOM aspires to establish itself as a first-choice partner in international research partnerships. Evidently, this is already the case to a considerable degree.

Judging from the Self Assessment Report, the UoA seems to be less intensively connected within the national academic networks. This might, of course, be partly a taken-for-granted thing that is just not articulated. But the UoA itself also makes the claim that it is better known internationally than nationally. All in all, however, key figures indicating academic collaborative networks are high.

Coproduction and external non-academic cooperation

Grade: Very good

The reputation of academic expertise extends to outside academia, in particular politics and administration and – increasingly, the Evaluation Panel notes – to professional networks of organizational communication. The UoA does have some intensive and well-developed collaborative relations. Research activities are co-funded by the media industry and other industry partners too. The Media Development and Organizational Communication groups are particularly active and successful here. There are some doctoral students supported by industry partners and indirect funding from industry partners is growing. (Tables 3.2.1. and 3.2.3)

Impact on society

Grade: Excellent

The general societal impact of DEMICOM can only be described as excellent. The senior research team is exceptionally strongly represented in various government committees as standing experts. The expertise of the UoA has also been in demand more intensively, at the highest level of political decision-making of the Swedish government. In addition, scholars from the UoA are frequently approached to serve as experts in the media.

The two case studies described in Self-Assessment report show a clear commitment to research designs in which scientific expertise is exposed to fruitful interaction with other social actors and institutions. Both cases also illustrate the wide range of academic, professional and industry networks in which DEMICOM researchers operate.

The Image of the Financial Crisis: Public Trust and Public Expectations: This project studied the importance of the “perceived management” of financial crisis in sustaining and building public trust. It mobilized a wide community of experts, stakeholders and academics. Multiple methods were used in an integrated conceptual framework (in-depth interviews with key actors, text analyses of actual

governmental communications, content analysis of news media coverage, and panel surveys of public opinion changes). By modeling the dynamics between actual political performance, media frames and public expectations, the results offered new insights to public stakeholders about the dynamics of public trust in a crisis.

The project was funded by central public institutions in the field of economics (Finansinspektionen, The Swedish National Debt Office, The Swedish Tax Agency and The Social Insurance Agency). The documented reference about impact and scientific output is very good (mostly coming out after the initial evaluation period).

Communicative leadership – Analysis and development of core competence: This project is aimed at both scientific and applied knowledge on “communicative leadership” in research areas of leadership and communication in communication science and quality technology and management. By applying multidisciplinary research design and a rich variety of methods that also engaged the stakeholders themselves it showed a strong relationship between communicative leadership and implementation of organizational change, co-worker commitment and workgroup efficiency. Given the contemporary rapidly changing working life and organizational contexts, these are highly relevant findings. The project enhanced the theory of communicative leadership, developed a new audit approach that was also benchmarked. The academic impact is clear. The societal impact has been recognized by participating business organizations. Reports in Swedish have received much attention and the results are widely used. The project was financed by the Swedish Knowledge Foundation and the participating business companies (Nordisk Kommunikation, Norrmejerier, Saab, Sandvik, Spendrups och Volvo). Communication of the results was supported by the Swedish Communication Association, Sveriges Kommunikatörer. In addition to social impact, the project also exemplifies the cross-disciplinary potential of the university.

Strategies and plans for development

Grade: Good

The SWOT analysis of the Self Assessment Report and the discussion during the site visit show that the UoA has been actively identifying its strengths and weaknesses or risks. Mostly, the Evaluation Panel thinks, these self-evaluations are well articulated and argued for and recognize important challenges that should be taken seriously. However, strategic initiatives are directed primarily towards the faculty. They focus on internal analysis and organizational (or resource-related) issues. Even within this limitation, the action plans suggested in the Self Assessment Report and interviews were rather conservative and hardly reaching beyond the activities that are already part of DEMICOM’s profile: maintain publications rate, improve research environment, continue to build and strengthen old networks and strategic alliances. These are all valid points concerning the future of the UoA, and ones that the university and faculty would do well to address. There are, however,

two limitations in the strategic thinking exemplified by the UoA's Self Assessment Report that the Evaluation Panel wishes to underline.

First, given its ambitious goals, the UoA should develop a more focused strategy plan that clearly outlines the measures through which these goals can be achieved. The section on "Strategic planning for the future" in the Self-Assessment Report is very effective in identifying the existing deficiencies, but it is less successful in providing a road map for changing things. For example, the need for more stable, long-term funding is not sufficiently underpinned by steps to be taken to rectify the situation. Or, what are the alliances DEMICOM seeks to strengthen or establish, and how can this be achieved (e.g. visiting scholars, application to EU funded network, etc.).

Second, the UoA should sharpen its vision of its role and relationship within the strategic framework of the whole university. This the UoA cannot do alone of course, but both the UoA and the university more generally would benefit from this. The Evaluation Panel believes that DEMICOM deserves a more central role in the University's future strategy. The centre is a showcase of excellent research and through its close networks with national policymakers it can contribute to the profile and political weight of the university. In the opinion of the Evaluation Panel, the categorization of DEMICOM as an 'additional' rather than one of the 'strong' research areas undersells the weight of this research centre.

Recommendations

Based on the self-assessment document and discussion the Evaluation Panel recommends

1. to develop a strategy that allows DEMICOM to effectively respond, and adapt to the changing research environment within and outside the University;
2. to invest in preparing a successful application for a large-scale EU-funded research project (Horizon 2020).

Other issues

The Evaluation Panel felt that the equal weighting of outputs (journal articles, book chapters, monographs, edited books etc.) in the bibliometric data distorts the evaluation of the productivity to some extent. In the Social Sciences and Humanities monographs remain a major format of advanced scholarship and should receive higher weight than, for example, a chapter in an edited volume.

Some of the bibliometric data provided were difficult to interpret and some instances of inconsistency made the Evaluation Panel reluctant to rely on these data. For UoAs that are divided into sub-groups, like DEMICOM, a breakdown of the statistics would have been helpful.

UoA 6.3 Quality Technology and Management Faculty of Science Technology and Media

Experts: Prof. Katrin Voltmer, Prof. George Bohoris, Prof. Risto Kunelius
and Prof. Julie McLeod.

General assessment

The UoA 'Quality Technology and Management' (QTM) was established in 2001. It is a relatively small research group of 12 members, most of whom being involved in one of the group's ongoing research projects. The UoA sees itself in a pioneering position in a young subject field that offers innovative routes to developing new approaches to production and management. It is an interdisciplinary group of scholars with an interdisciplinary outlook closely rooted in the region. The Evaluation Panel was impressed by the enthusiasm and commitment of the group members we talked to during our site visit. The UoA nurtures a culture of inclusiveness and collegiality that fosters the development of research capacity of individual members and a collectively shared vision of innovative research that is relevant to society.

During the evaluation period the UoA has produced research outputs of high quality and has been involved in relevant academic networks of collaboration, mainly at a national level. A particular strength of this UoA is its extensive and productive involvement with non-academic stakeholders from both the industry and the public service sector that has resulted in important research outputs and the development of various research and management tools. In many respects, QTM still seems to be in a process of developing its full potential, even though it has existed for 12 years. A group of currently 10 research-active members is rather small and probably lacks the critical mass to engage in the large-scale research that is necessary to obtain wide international visibility and reputation. The Evaluation Panel thinks that the UoA is a promising, dynamic and innovative research group, working in a highly relevant field of contemporary economies. Increasing the research capacity (number of staff, time allocated to research) and strengthening leadership could help to bring the UoA into a nationally leading and internationally noteworthy position within its field.

Quality of Research

Grade: Very good

The quality of research output is generally very good. Researchers of the UoA have been awarded prizes for best papers indicating the high standard of research and international recognition they have earned in their research community. Members of the QTM research group are regularly invited to present at the International QMOD conference, one of the most important international conferences in the field

(of which the UoA also is a key organizer).

Of the UoA’s publication output 27% has been published in international peer-reviewed journals; a further 24% of the research output falls into the category of peer-reviewed international conference papers. However, the range of channels (journals, conferences) is relatively limited. Publications are concentrated in a few journals, and most of the conference papers were presented at one particular conference. Undoubtedly, the outlets are of high international standing, but to strengthen their international recognition in the field researchers of the UoA should aim to broaden and diversify the channels through which they communicate their research. During the site visit, QTM members pointed out that due to quality management being a young field, there are only few journals that are dedicated to this particular area of enquiry. However, the Evaluation Panel suggested that in order for interdisciplinary research field outlets of neighboring disciplines to be considered as suitable, albeit sometimes challenging opportunities of dissemination. For an emerging field of inquiry, such an interdisciplinary approach is of key importance in aiming to establish its impact on the scientific community at large.

So far, the UoA has not implemented a coherent system of internal peer review, but publication plans and work in progress are spontaneously shared in a constructive spirit of collegiality and mutual support. The Evaluation Panel feels that a more systematic approach to internal peer review would help to further improve the quality of research outputs and to develop a more focused publication strategy.

The UoA has developed effective mechanisms of integrating research and teaching. A graduate programme in Quality Technology & Management was established at Miun in 2007 together with Psychology, but is now run independently by the UoA. Teaching is actively used to apply research and to develop new ideas. For example, the value mapping tool has been developed in close interaction with graduate students and has subsequently informed research.

The table below summarizes the evaluation:

	Excellent	Very Good	Good	Insufficient
Attention	Wide international	International	National	Neither national nor international
			X	
Channels	Most prominent	Recognized	Recognized	
			X	
Research	World leading	Nationally leading	Near the research front	insufficient
		X		
Overall			X	

Table 1: Quality of Research

Productivity

Grade: Good

Overall, the productivity of the UoA is good with a potential of very good. When evaluating the productivity of the UoA it has to be taken into account that the sole professor of the research group has been continuously involved in high-level management roles at University and Faculty level (Deputy Vice Chancellor, Vice Dean of the Faculty and leader of the ARC13 exercise). The Evaluation Panel felt that this might have impacted on the volume of outputs, but perhaps also on the ability of the UoA to obtain research grants.

Considering the information provided in the bibliometric data of the Self-Assessment, the Evaluation Panel thinks that the total number of publications (currently 50.75) as well as the annual average of publications (currently 8.46) should be increased. As mentioned in the previous section, the UoA should aim for a higher number of journal publications and put less emphasis on publications in conference proceedings of one particular association.

In addition to standard formats of academic publishing, the UoA has also published a considerable amount of popular science articles to achieve a broader range of dissemination of research results that reaches relevant end-users in the business community and the public sector. This type of publication amounts to 28.6% of the total volume of output and reflects the UoA's aim to produce knowledge that is relevant to society. Research outputs also include scientific tools, such as a questionnaire and a tool for experience tracking, which do not easily fit into the currently used instrument for measuring research productivity.

The number of PhD students supervised to completion is good, especially considering that at present there is only one member of staff who is eligible to supervise PhD students. The success of the UoA to secure external funding for three doctoral students deserves particular mention. Several PhD students that graduated during the reporting period have subsequently been employed as Assistant Professors and are now active and productive members of the UoA. So far, no promotions to Associate Professor have been made, which contributes to an uneven distribution of leadership and supervision tasks. However, in the interview, the Evaluation Panel learned that one application for Associate Professorship is under way and another one is about to be submitted, which is very promising for the future.

Overall, productivity of the UoA can be summarized as follows:

	Excellent	Very Good	Good	Insufficient
PhDs	Very high number	Above average	Average	Clearly below
			X	
Promotions	Very high number	Above average	Average	Clearly below
				X
Publications/ resources	Very high number	Above average	Average	Clearly below
			X	
Overall			X	

Table 2: Productivity

Research Environment and Infrastructure

Grade: Very good

The UoA has developed a form of collective leadership that effectively uses insights from the group’s research to implement cohesion, internal collaboration and mutual support. Even though the Evaluation Panel appreciates the collaborative style of organization, we feel that a stronger and more focused approach to leadership would contribute to a sense of direction and increase productivity of the UoA. As mentioned already in the previous section, having only one Professor who is occupied with substantial management roles outside the UoA and the absence of middle-level leadership, i.e. Associate Professor(s), might weaken the UoA’s ability to achieve and maintain a leading role in their field.

There is a well-developed culture of internal discussion and planning. For example, four extensive planning meetings per year provide a forum to discuss upcoming project opportunities and the development of the UoA’s research portfolio.

Graduate students receive extensive supervision and support, which is reflected in the fact that none of them has dropped out of the programme and all of them have obtained their intended degree.

The ability of the UoA to attract external funding is very commendable, especially as internal funding is in decline, and has steadily risen over the last four years.

A significant number of fundraising activities of the UoA are undertaken in collaboration with other research groups and departments of the University, for example Media and Communication Studies, Informatics etc. However, there is an over-reliance on EU structural funds. The UoA is aware of this problem and has incorporated plans for attracting external funding in their strategic plan. The Evaluation Panel suggests that the UoA tries to aggressively widen its sources of external research income. In particular, focused efforts should be made to develop successful bids for research grants from national research councils and/or the European Union, perhaps first through partnerships with other fields of inquiry, since such networking clearly is one of the strengths of the UoA. This will also

contribute to the conceptual and theoretical development of the UoA, which is not possible within the framework of short-term, applied funding frameworks. In the longer term, independent theory building and “own” projects (as the Self-Assessment report points out) are essential for strategic success. In this respect, too, the UoA has clear potential to lead international co-operations since Sweden has a leading role in institutionalizing the field of inquiry in question.

Other aspects of infrastructure, such as laboratories and equipment, are not applicable to the kind of research activities carried out by this UoA.

The table below summarizes the evaluation of the research environment.

	Excellent	Very Good	Good	Insufficient
Leadership	Excellent	Very good	Satisfactory	Unsatisfactory
			X	
Constitution of staff	Excellent	Very good	Satisfactory	Unsatisfactory
		X		
External funding	Excellent	Very good	Satisfactory	Unsatisfactory
		X		
Overall		X		

Table 3: Research environment and infrastructure

Research Networks and Collaborations

Grade: Good

The UoA is engaged in wide and diverse academic collaboration within Miun, for example with Media and Communication Studies, Informatics, Mechanical Engineering/ Sports Technology, Sociology, Business Administration and Tourism, reflecting the interdisciplinary approach of the research portfolio of the UoA and its commitment to team work.

QTM has also established networks with high-quality partners in Sweden and has been involved in establishing the Swedish Quality Management Academy in 2011. The latter is of strategic importance for the UoA to establish itself in a leading position in their discipline. So far, the UoA has only very few collaborative links with international partners, e.g. in Denmark and Spain. The lack of international partners is also indicated by a low average of countries/publication in the bibliometric data. Strengthening international networks of academic collaboration should be a strategic priority for the next couple of years, including incoming and outgoing visiting fellows, joint research bids with international partners, joint publications, etc.

	Excellent	Very Good	Good	Insufficient
Collaboration	Nat/international, very high-quality partners	High-quality partners	Collaboration is wide and relevant	Collaboration is insufficiently developed
			X	
Partners contribute to research				
		X		
Overall			X	

Table 4: Research networks and collaboration

Coproduction and External Non-Academic Cooperation

Grade: Excellent

The engagement with non-academic partners is one of the particular strengths of this UoA. The network of collaboration with non-academic partners is extensive, including a large number of both national and regional industrial partners (such as SAAB AB, Skistar AB, Sandvik Mining AB, Volvo Group AB, Nordisk Kommunikation, Nordlock AB, etc.) and public sector partners, such as the Municipality of Sundsvall, Swedish Dental Service and several local schools). There is evidence that partners are integrated in, and contribute to the UoA’s research activities. The UoA is also the coordinator of the Swedish Industrial Lean Initiative that involves wide industrial participation (to date, more than 150 companies are reported to have participated in the project). This initiative has enabled the QTM research group to continuously interact with modern quality management practices which in turn has informed their research activities.

The UoA has been active as a co-founder of the Swedish Quality Management Academy alongside institutional (Swedish Institute for Quality) and University partners across the country. This initiative has rendered Sweden the first country to establish a common research platform that develops academic competences in the field with direct benefits for industrial and public service stakeholders.

The two impact case studies included in the Self-Assessment further corroborate the excellent work of the UoA with regard to knowledge transfer and providing value for the wider society. One of the case studies elaborates in more detail the group’s development of a visitors’ tracking tool in the regional sports industry. The other case study outlines the development of a research tool to measure soft values, such as leadership commitment and participation in organizations.

Overall, we feel that the UoA is worthy of an overall grade of ‘excellent’ even though the reach of coproduction and collaboration is mostly national.

	Excellent	Very Good	Good	Insufficient
Collaboration	Very high-quality partners, wide and relevant collaboration	High-quality partners, wide and relevant collaboration	Relevant collaboration	Insufficient collaboration
	X			
Research value	Strategic importance for partners	High value	Value	
	X			
Overall				
	X			

Table 5: Coproduction and external non-academic cooperation

Impact on Society

Grade: Very good

This aspect of the assessment incorporates elements of previous categories. Given the extensive engagement of the UoA with non-academic partners, the significance of the research activities is high. This is, for example, indicated by the award of 'Innovator of the Year' in 2010 to one of the QTM researchers in recognition of his achievements in co-creating knowledge and conducting research in an innovative way. However, the international reach of the research activities of the UoA still needs to be developed.

	Excellent	Very Good	Good	Insufficient
Reach	International reach	International reach	National reach	Lack of reach
			X	
Significance	High significance to society	Significance	Some significance	Minor significance
		X		
Overall			X	

Table 6: Impact

Strategies and plans for development

Grade: Very good

The UoA has a well-developed strategy that outlines the values that underlies the research activities of the group that focuses on academic excellence and societal relevance. An extensive SWOT clearly identifies weaknesses and opportunities, which should form part of the UoA's development plan in a more systematic way. The strategy also states its primary mission and goals to be achieved by 2015, for example increasing the amount of external funding. However, this could be better articulated in a clear strategic plan that specifies in more detail the steps to be undertaken to achieve the goals. In particular, there is the need to develop a more detailed publication strategy and steps towards large-scale research grants.

	Excellent	Very Good	Good	Insufficient
Reach	Strong, clear vision	Clear vision	Needs some development	Lacks vision and strategy
		X		
Significance	Very promising junior faculty activities	Promising activities	Sufficient activities	
		X		
Overall		X		

Table 7: Strategy

Recommendations

Based on the self-assessment document and discussion the Evaluation Panel recommends

- to develop a clear publication strategy to ensure publication in a wide range of international peer-reviewed journals with less dependency on conference proceedings
- to develop a strong network of international collaboration
- to target funding from Research Councils in addition to industry-based research to ensure long-term research and the conceptual and theoretical advancement of the UoA’s research programme
- to develop a strategy for staff development to ensure middle-level leadership and a broader sharing of responsibilities in management and supervision of doctoral students.

UoA 6.4 Information Systems Faculty of Science Technology and Media

Experts: Prof. Katrin Voltmer, Prof. George Bohoris, Prof. Risto Kunelius
and Prof. Julie McLeod.

General assessment

The Information Systems UoA at Mid Sweden University (Miun) is relatively young, comprising four groups (CEDIF, CRIINFO, CRIDIT and CIE) located on three different campuses and in three different departments. Currently the groups are relatively autonomous and linked by a shared interest in information, systems, design and mostly social science methods, from a diversity of perspectives. The UoA is to be commended for using the ARC13 self-evaluation exercise in a positive way, investing in an independent facilitator to conduct their SWOT analysis through two workshops and being self-critical. The outcome was a clear sense of position, the development of an outline strategy and greater confidence in their ability to improve their performance and their standing in the field.

The Evaluation Panel found it regrettable that one group (CIE) was not present at the meeting.

Quality of research

Grade: Very good

The UoA's research has received national and in some cases international attention in the scientific community via recognized channels such as international journals and conferences, including invitations to speak. The Evaluation Panel notes that in this discipline citations are not a reliable/useful indicator of impact; the number of Information Systems journals included in Web of Science is limited, only including some of the most highly regarded journals in parts of the field (e.g. *Archival Science*) in which UoA staff have published. The publications indicate that there is also recognition in the relevant parts of the professional information systems community (e.g. records/archives management).

The focus and approach to research varies across the four groups; e.g. one group (CRIDIT) articulated theoretical depth and others (CEDIF, CRIINFO) the important link with practice and pedagogy. Theoretical maturity and a critical reflective approach were recognized as being important for quality research as was the need to remain close to and be relevant for practice because of the professional nature of parts of the discipline. The UoA has the potential to share their knowledge, understanding and perspectives on these two dimensions of research (academic excellence and societal relevance) across the groups. This is important in the context

of both Miun's research strategy 2012-16 and the creation of new opportunities and new research agendas.

The UoA's publications cover a very wide range of subjects and approaches from very theoretical to very practical and are published in a wide range of journals and conference proceedings. UoA staff members have co-authored with scholars from institutions in Sweden, Europe, the USA and Australia. The material seen by the Evaluation Panel indicates that the UoA is able to produce high quality outputs that are theory based and/or knowledge application based and also demonstrate the ability to achieve and present clear analyses and new findings. The quality of journal article outputs varies, some appearing in journals that would be regarded as Level 1 and 2 in the scientific community, others in more professional ones. Conference publications include some in the leading Information Systems conference (*International Conference on Information Systems*), regarded as being equivalent in quality terms as a Level 1 journal due to its rigorous peer review process and low acceptance rate.

The majority of outputs reviewed would fit the grade 'good' with some being 'very good'. However, there is concern about the quality of some outputs and, whilst examples were provided of the use of informal peer review processes prior to submitting articles; this is something that should be reviewed. There are signs that aiming to submit quantity for ARC13 has affected the overall level of quality.

There is clear evidence of a quality culture in the context of PhD research. The UoA pays attention to the quality of PhD processes and PhD student outputs through robust peer review via, for example, research seminars. Similar emphasis needs to be placed on internal peer review processes for staff outputs and research bids to avoid the quality issue referred to above. PhD students are supported to attend both subject related and doctoral conferences, including international ones. Overall, the Evaluation Panel felt that the quality of the UoA's research deserved the rating 'very good'.

Productivity

Grade: Very good

Overall, productivity is very good, particularly in light of the data for Professors who have left during the period not having been included in the data tables (See p. 14 of the self assessment document).

The majority of the UoA's publications are articles in peer reviewed journals and peer reviewed conference papers. Over the period, the number of articles published in peer reviewed journals (an indicator the Evaluation Panel regards as the most significant one) is stable and the productivity is 4.3 publications/FTE (2011-2012), which is very good.

The number of PhDs awarded in the period is 10 (an average of 2.08 per academic staff eligible to supervise). Within the context of the discipline, parts of which are relatively small with limited academic career paths and/or more attractive career

paths in the private sector, this can be regarded as 'above average'. Doctoral study has been used successfully as a recruitment and career development route for building the UoA's academic staff base. PhD students have been funded both internally and externally. This is commendable in a UoA whose discipline does not have a long academic history and therefore does not attract large numbers of doctoral students. Since the size of the PhD community indicates how many can be recruited and the number of staff who are eligible to supervise them, this is a relative strength of the UoA.

There have been three promotions during the period, particularly through the PhD route, which evidences the ability to progress in their career. As the UoA consolidates and implements its future strategy, productivity should show an upward trajectory.

Research environment and infrastructure

Grade: Good

The UoA has concentrated on developing the identity and focus of research in each of the four groups, each of which has a Professor. Relatively autonomous, the groups are linked through the concepts of information, systems and design and their social science approach to research. Clearer and stronger intellectual leadership would be conducive to the development of the UoA's research strategy and agenda. This could also, in a more effective way, improve the ability of the UoA to address the challenge of creating cohesion in the UoA's split site (three) and split department (three) structure.

The constitution of staff has a relatively small middle level leadership; further developing Associate Professors would support the intellectual development of research. Promotional opportunities for Assistant Professors would increase the capacity to continue supervising PhD students. Upcoming retirements of Professors could provide a good opportunity for career development for younger scholars. Although the UoA's research is not heavily laboratory (hardware/software) based, it is surprising that there is no dedicated technician resource support. This is already hindering the exploitation of CEDIF's Digital Curriculum Laboratory for research purposes and may become an issue with plans to conduct e-learning research.

The Evaluation Panel welcomed the e-learning initiative which not only aligns with Miun's strategy but will also enrich the research agenda; it will require appropriate technical support.

The UoA is supporting and developing its research culture through monthly meetings attended by staff and PhD students. These cover both planning and reporting of funding opportunities and application and progress reporting. Whilst this exposes PhD students to issues that will concern them beyond their PhD, it could be useful to have separate meetings - strategic/management - meetings attended by more senior staff, and research seminars attended by all where the focus is on

intellectual content, peer review and development.

The UoA has successfully enhanced its infrastructure by using tools provided by external companies, e.g. CIE's use of modeling tools from LINDO systems and decision-support tools from a spin-off company founded by staff members.

The staff has been very successful in attracting external funding from a variety of sources and a large portion comes from public bodies such as municipalities, EU structural funds and Swedish foundations. They have also attracted money from industry, working with small regional companies. Bids to Research Councils have not yet been successful. The level of annual external funding of the UoA almost matches the annual faculty funding, which is a promising ratio, given the external funding mechanisms for this discipline. Thus, the diversity of funding sources is healthy, meaning the UoA is not reliant on one sector. However, the mix would be improved if EU bids other than structural funding ones were submitted. Research Council funding needs to be secured to reach what is demanded by very good/excellent research outputs that, while being relevant to society, engage in conceptual and theoretical development.

The UoA works internally with other disciplines such as sociology, political science and the risk and crisis management (RCR) research profile, which is important in the context of interdisciplinary research to address current information management challenges. Outreach work includes seminars for professionals at Stockholm City Archives, a leading innovator in record keeping practice in the country, to help prepare them for changing roles in the digital environment.

Research networks and collaborations

Grade: Good

The UoA's staff members are recognized nationally and internationally in their discipline as evidenced by the significant number and variety of requests to participate in the academic community (e.g. external examination of PhD theses; keynote / plenary conference lectures).

Different national and/or international academic networks are used to conduct collaborative research, for example CIE with Stockholm University, producing state-of-the art decision analysis software and CRIINFO with the College of Nord-Trøndelag, on risk and crisis situations. Staff members are also active in network developments (e.g. the Swedish Information Systems Academy). CRIDIT's work with Linköping University coordinating the well-established Swedish eGovernment Research Network spans national, regional and international boundaries and brings together both academics and practitioners. There are some international collaboration with leading academic institutions, e.g. CEDIF's work with Simons College, USA and University College London to develop the Digital Curriculum Laboratory which is used for education purposes but is being considered as a resource for future research. CEDIF has made a strategic decision to lead one of the

InterPARES projects at the University of British Columbia Canada which, whilst not providing any funding, will raise their international profile. Their work with Stockholm City Archives has led to them becoming a case study in the research. The UoA is presently in the process of actively expanding their international networks through research stays with potential collaborators with the aim to develop future joint research.

Researchers are considering an application to the EU's research networks scheme, which would be a first step towards being able to submit bids for larger research grants, e.g. Horizon 2020 (EU) or national funding schemes.

Co-production and external non-academic cooperation

Grade: Very good

Collaboration with high quality external non-academic partners is wide. The staff has established strong regional and national networks and some international ones. Close co-operations are proactively sought. The UoA has also been approached directly by external partners indicating its reputation for delivering high-quality research and services.

The Evaluation Panel was very impressed by the number of organizations with whom the UoA collaborates (almost 100) and by the variety of links with local and regional communities in both the public and private sector organizations (e.g. local municipalities, tourism, fire brigades, transport companies and small businesses). These partnerships enable testing of research developments in real environments, problem identification and problem solving. There is significant national collaboration on e-government research with both the public sector and private sectors. In addition to the networks highlighted above, CRIDIT's work with the Swedish eGovernment Delegation, Swedish Association of Local Authorities and Regions (SALAR) and Vinnova and with Nordic Peak AB are good examples, as is CEDIF's work for the Swedish National Archives in the e-archive project commissioned by the Swedish eGovernment Delegation and with different municipalities.

Almost all of the UoA's external funding comes from cooperation with local and regional stakeholders. The continued funding stream constantly amounts to a significant level and this is a strong indication that this UoA's research has a high value for the partners which results in continued loyalty. In kind funding is also very good (almost SEK1m).

The UoA is an excellent example of the University's aspirations to engage in the co-production of research that is relevant to the surrounding society.

Impact on society

Grade: Very good

The nature of the UoA's research is such that it all has potential for impact on society

with local, national and/or international reach. The two case studies exemplify the significance of the research.

The first case study provides several very good examples of the impact of research that is taking a critical studies, socio-material approach to information systems design. The DDD (demand driven development) project has opened up a dialogue between key actors, including citizens of the design, development and delivery of public sector information systems and offers a different approach to e-service design. Collaboration with the Dragon Open Source Foundation (DOSF) and an IT consultancy company (Nordic Peak) has led to the development of an award winning email service (Foraldramet) for parents and teachers to communicate between home and school. With most Swedish municipalities now using the platform, and private kindergartens and schools using it via a cloud service, it is evidence of significant impact. Another project with DOSF, Nordic Peak and a local municipality has led to the development of another award winning platform (Community Base), which is also the base for other e-services with parents and teachers. The challenges of e-government and e-service design are significant; the UoA's research and development is contributing to addressing some of them in an innovative way.

The second case study illustrates the impact of research on recordkeeping in a range of different organizational contexts. The EU Botnia Atlantica funded project with the Turku School of Economics, Finland, compared data management practices in SMEs in Sweden and Finland, identifying current and future user requirements and development needs to improve data management. A study of the digital records management needs of a large and complex railroad infrastructure project (the Adal Railway) identified issues of access to and preservation of records over the long term. This has value for organizations working on other complex construction or large projects and has added to the very limited research in the area. Two projects related to e-government are also cited as examples. The EU funded project with the County Board of Västernorrland and two local municipalities exploring the impact of e-government on the roles of archives/records professionals, and the e-archive project with the Swedish Government (referred to above) both of which have potentially much wider value.

The two case studies demonstrate the impact of the collaborative research for staff in the UoA. They are now recognized as experts in these areas and as a result, some have become members of national boards and juries (e.g. the National Association of eCompetence and DOSF) and others have been invited to participate in two international research projects at the University of British Columbia, Canada, one of which is possibly the largest archival research project anywhere. This recognition of expertise positions the UoA well for the future.

Strategies and plans for development

Grade: Good

The SWOT analysis in the self-assessment report and the interviews show that the UoA has been self critical and reflective. The Evaluation Panel thinks the self-evaluation is well articulated and argued for and recognizes important challenges that should be taken seriously. Equally important for the UoA at its stage of development; identifying the strengths (strong societal networks, range of cooperations and the applied nature of the research which have enabled EU funding to be secured) has given staff greater confidence in their ability to improve their research performance. The UoA's summary self assessment identifies good potential but offers only rather conservative problem solutions and low ability for its realization. The Evaluation Panel agrees that recruiting qualified staff is challenging for Information Sciences, partly because of the size of the pool of potential candidates. The issue of recruiting PhD students has not been a problem so it is unclear why the UoA sees it as a growing problem. Renewal through staff and PhD student development is partly addressed in the infrastructure section above. The ability to realize the potential in terms of international positioning appears to be a function of staff's personal circumstances and is something which needs to be carefully managed. Success in securing local funding and a lack of experience in submitting bids to research councils, the EU etc have lead to a lack of confidence in the ability to attract external funding. The UoA should seek university support in preparing bids and find partners with whom to collaborate rather than lead in order to gain experience and develop competence.

The UoA has developed an outline strategy as a result of their self reflective SWOT analysis, which is positive. However, the strategy is a skeleton which needs fleshing out with the detail of what each element means and how it can be realized. The CRIINFO group has developed a vision but there is no overall vision for the UoA. This group's vision would be a useful starting point to develop a shared vision for the UoA as a whole. It would also support greater interaction between the UoA's four groups and future collaboration and cooperation. It could even promote a discussion about whether or not the UoA should be a single group with research themes and the most appropriate leadership model moving forward.

There is a focus on increasing the UoA's internal visibility within the faculty and university. This could be achieved by, for example, building on and seeking out new interdisciplinary research projects, inviting researchers to discuss new methodological and theoretical approaches. Given the UoA's stage of development, the Evaluation Panel sees consolidation and stabilization of achievements to date as the strategic priority. This is reflected in the self-assessment document and the discussions during the visit.

Recommendations

Based on the self-assessment document and discussion the Evaluation Panel recommends

1. to develop a clear vision for their research and a coherent strategy to which all staff should be fully committed;
2. to establish a clear leadership structure;
3. to make a concerted effort to develop an infrastructure that promotes research development and improves the consistency of the quality of research outputs, for example dedicated research seminars separate from research management meetings and systems of internal peer review;
4. to target funding from Research Councils, in addition to the existing income streams, in order to be able to fully realize the potential of theory-based research outputs.

Other issues

The constraints on the recruitment of PhD students seem to make 'number of PhD students' as a productivity criteria largely meaningless.

The Evaluation Panel felt that the equal weighting of outputs (journal articles, book chapters, monographs, edited books etc.) in the bibliometric data distorts the evaluation of the productivity to some extent. In the Social Sciences and Humanities, monographs remain a major format of advanced scholarship and should receive higher weight than, for example, a chapter in an edited volume.

Some of the bibliometric data provided were difficult to interpret and some instances of inconsistency made the Evaluation Panel reluctant to rely on these data. For UoAs that are divided into sub-groups, like Information Systems, a breakdown of the statistics would have been helpful.



4.2.7 Research Field 7: Engineering Sciences

UoA 7.1 Fibre Science and Communication Network (FSCN)
Faculty of Science, Technology and Media

Experts: Prof. James Olson, Prof. Angeles Blanco,
Former Research Director Lars Gädda, Prof. Alison McKay,
Prof. Janne Laine, Prof. Bandaru V. Ramarao, Prof. Joachim Rosenthal
and Prof. Kerstin Witte.

General assessment of the UoA

FSCN is an important research initiative from a MIUN point of view. It is a major attempt to gather a critical mass under the idea of forests as a resource umbrella and thus obtain higher research capabilities, better visibility and impact and an opportunity to build on existing contacts, cooperation and collaboration with mainly local and national industry.

This research area was initiated in 2007 and has since undergone continuous development; a proper consolidation of the activities has thus not yet occurred. It consists of several (in the beginning nine and now fourteen) interdisciplinary units, which find challenging and rewarding new research opportunities. FSCN drives strategic planning in the area of forest as a resource and this work has led to major research openings and activities within the four selected research topics.

The cooperation between FSCN and the corresponding research units has developed in a favorable way, and interdisciplinary cooperation with another research initiative, STC (Sensible Things that Communicate), has evolved and continues to develop. We assessed thus how and to what level FSCN has generated added value in relation to the other units of assessment, mainly Chemical Engineering, Chemistry and Engineering Physics.

Collaboration with local and national industry has remained strong, and this is an asset FSCN wants to build on in the future and aims to strengthen it further by initiating new contacts and cooperative projects.

Overview

Mid Sweden University's research strategy states that research effort will be focused towards seven defined research areas, which allows the university to reach sufficient international competitiveness and allows good cooperation. The other objective with these research areas is to obtain excellence and synergy with education through intra-disciplinary research..

FSCN is one of these selected research areas. FSCN was established as a network of professors in 2007, and in 2010, it was integrated into the university line organiza-

tion. FSCN was then further developed to generate research programs. In 2013, these programs covered all of Chemistry (CHE) and half of the natural sciences (NAT). The two research initiatives, FSCN and STC, created a synergistic research environment within the Faculty of Science, Technology and Media, NMT (Naturvetenskap, Teknik och Media).

FSCN is a research centre which focusses on the study of forest as a resource, with the aim of effective cooperation among industry, academic research and commercialization.

FSCN research areas are:

- Mechanical pulping
 - Scandinavian companies involved
 - HYP group leading (high yield pulp)
 - Raw material chipping process
 - Process technology (refining, yield, energy, properties)
 - New or improved products and qualities
- Water chemistry
 - Surface active complexing agents, removal of heavy metals, foaming, etc.
- Industrial symbiosis
 - Not biorefinery as such, more selective, industry-focused applications
 - Bioactive substances from the forest
 - Gasification
- Advanced paper materials
 - Consolidation agenda
 - Computational modelling of paper products
 - Strategic innovation agenda in future textiles and paper
 - Harvest and store energy
 - Paper electronics
 - Suitable, smooth substrates
 - Demonstrators
 - Paperboard and fiber composites
 - Barrier properties, mouldability, strength
 - Live paper
 - Demonstrators of new concepts

Within these research areas, FSCN strives to make world class science, generate new businesses through innovation activities and provide unique support to the existing industry.

FSCN is led by the research director, who leads strategic planning and has a strong connection with the MIUN management.

Group leaders and department heads are the key actors in actual day to day research, funding and contacts with industry.

Interactions between group leaders and director are also important; groups formulate interesting research openings, which are presented and discussed within the research forum. The research director makes a synthesis of these discussions and makes the decision of which ideas and initiatives are taken forward.

Strong strategic support and advice in strategic planning is obtained from the FSCN steering group, including capable members from the industry. This steering group is composed of four VP-level members from industry and five internal members.

The main industrial contacts within the research groups are handled mindfully by the group leaders in their direct contacts with the industry, to avoid mix-ups and to avoid conflicting interests of different industrial interests. During these meetings, essential research ideas and initiatives are generated and discussed.

Education is, however, acknowledged as a major challenge among FSCN partners.

FSCN has also focused on activities which aim at securing future funding,

- Research agenda on advanced paper materials, Vinnova, Per Edström
- FORIC industrial research college (KK foundation), Vinnväxt synergy, Per Engstrand
- European collaboration on advanced material, WoodWisdom
- EU's new regional development plan, Åkroken science park, Erik Hedenström

Areas of strong research that have potential to grow stronger

Through its strategy work, FSCN has identified four research areas, which are the current focus areas:

Strategic goals for FSCN

1. Consolidate research in advanced paper
2. Grow water chemistry
3. Broaden mechanical pulping research
4. Collect research under industrial symbiosis

SWOT Analysis

The main strengths within FSCN are:

- Networks with paper industry
- Design-driven innovation capacity
- Unique combination of specific competencies

The main weaknesses are:

- Narrow industrial contacts
- Regional and national focus and limited international collaboration

The main opportunities are:

- Many applications for water chemistry
- National agenda for new paper materials

- Strong industrial interest in FORIC
- Potential new uses for mechanical pulp

The main threats are:

- Paper research community shrinks
- Not finding new industrial partners

Quality of research

Grade: Very Good

- Strong intra-disciplinary interactions have led to an increase in the amount and quality of ideas and research
- New key initiatives, such as KM2, have emerged from the FSCN network and have the possibility to become major initiatives within the university
- A stronger level of interaction with regional industry has already occurred
- FSCN's role in communication with the external network is getting stronger
- Commercialization of obtained research results by industrial companies and partners is further advantaged
- Process Engineering Physics will improve visibility and enhance the funding possibilities of FSCN
- Academic quality is now affected negatively due to the additional burden FSCN causes to the groups and their members.

Recommendations:

- Increase information within and among FSCN different groups about needs of relevance for industry
- Strengthen the buffer activity of FSCN to secure time and resources also for fundamental research
- Ensure possibilities to drive own academic/ high level research through additional funding efforts
- Ensure that the KK foundation strategic funding comes into use and look for opportunities to reduce bureaucracy in its use.

Productivity

Grade: Very Good

Discussion:

- The industrial school has had a positive impact on the number of graduates
- There have been some promotions of professors with the right profile
- No change in the publication activity yet, however, an improvement is expected in the near future
- FSCN has been positive about the industrial research school that was running and will continue as a new one is starting this year.

Recommendations:

- **For each project develop a publication plan that includes both industrial and high-level academic journals to ensure success in a broad range of funding programs; increase collaboration**
- An essential part of the FSCN strategy is to increase capacity in areas where they have the most potential.
 - Increase the number of invited post docs to increase the internal productivity
 - Hire a high level professor in each of the identified key areas, such as water chemistry
 - Retarget internal resources to the selected strategic research areas

Research environment and infrastructure

Grade: Excellent

Discussion:

- No changes in infrastructure have occurred due to the establishment and development of FSCN
- The infrastructure available for the various groups is considered excellent
- Representatives of the main key areas - wood chemistry and advanced paper materials (KM2) do not want to put money into new infrastructure at this stage of development of FSCN

Recommendations:

- **Further consolidate MIUN expertise and infrastructure into FSCN strategy**
- Secure the availability of existing infrastructure for research groups
- Increase the cross-use of infrastructure between the groups, develop an equipment and competencies data bank
- Build a network with other national universities to secure infrastructure which is not available within FSCN at the moment
- Integrate industrial design activities in all major initiatives, when this can bring added value to the outcome of research results

Networks and collaborations

Grade: Very good

Discussion:

- Good local and national collaboration in the key research areas, mechanical pulping and water chemistry

- The application areas of mechanical pulping must be broadened to other application areas
- The number of international collaborations in all areas is still too low; there are good opportunities to strengthen international cooperation in the new main focus areas: new applications within paper chemistry and advanced paper materials, especially KM2.

Recommendations:

- **Increase efforts to be successful in EU framework funding and fundamental science funding**
- Allocate specific resources for developing funding applications and aim at becoming coordinator in one of the EU projects
- Strengthen this capability by partnering, e.g. with Innventia
- Consider the possibilities to increase post doc invitations in key research areas
- Encourage post docs to go abroad and help them find placements internationally
- Strengthen the unique combination of industrial and graphics design and bio-material; one way to do this is to increase STC and FSC cooperation and leverage the strong industrial design.

Coproduction and external cooperation

Grade: Very good

Discussion:

- Strong area both in mechanical pulping and in water chemistry, especially collaboration with the industry
- Expand industrial network into non-traditional chemical, materials and end-product companies, perhaps through the creation of a bio-products advisory council
- Strong interest in new paper applications, paper four and paper five among new interesting industrial collaborations
- Excellent opportunities within the new initiatives such as KM2

Recommendations:

- **Expand industrial network into non-traditional chemical, materials and end-product companies, perhaps through the creation of a bio-products advisory council**
- Expand the strong interaction with industry nationally
- Increase the collaboration with international partners in key areas, e.g. EU framework programs

- Put considerable efforts into improve the image and brand of your key research areas

Impact

Grade: Very Good

Discussion:

- There is confidence that the UoA will be successful in replacing regional EU funding, if they are striking and specific enough in their applications.
- Work with Åkroken Business Incubator entrepreneurs is underway, with the target to develop bio businesses that will attract supplementary funding
- One target is to renew the regional industrial ecosystem, through FORIC and Åkroken Science Park.
- Industrial symbiosis is an attempt to create an open and innovative atmosphere for students and researchers to create new ideas and opportunities based on input from interaction with different industrial actors.

Recommendations:

- **Focus resources towards advanced, high-value bio materials and the integration with industrial design. Further, we note that KM2 is an unique opportunity that leverages strength in the Engineering Physics unit.**
- Need to broaden network of partners beyond paper industry.
- Create a process to support the development and growth of junior researchers in a planned career path.

Strategies and plans for development of the Unit

Grade: Very good

Discussion:

FSCN has made a thorough SWOT analysis and has identified its main strengths, weaknesses, opportunities and threats. This strategy process works relatively well, but can be improved to ensure better awareness of the changing world, especially because of the uncertain future of many aspects of the paper industry. The outcome of the strategy process is the four strategic goals for FSCN:

1. Consolidate research in advanced paper
2. Grow water chemistry
3. Broaden mechanical pulping research
4. Collect research under industrial symbiosis

Recommendations:

- **Accelerate efforts to rebrand FSCN as a forest bio-product research center**
- **Evaluate FSCN's research program within a future scenario planning process which could become the national standard for evaluating forest bio-product research initiatives**
- Rename the research area
- FSCN should establish a systematic process for growth in academic careers at the PhD level
- Look for opportunities to incorporate and combine with industrial design

Recommendations for development

Discussion:

FSCN conducts high level (in quality and productivity) of research relative to its size, resources and location of the university. It has a strong and appropriate strategy to support the regional and national industry.

By bringing together a broad range of activities and resources in a strategic area decided by the university, FSCN demonstrates its role as one of the important initiatives of the university.

Recommendations:

The ongoing change process within MIUN causes uncertainty among all research groups within FSCN. It is recommended to speed up the implementation and concentrate on the implementation of the main strategic goals of FSCN. Effort should also be put into change management.

Our main, more focused recommendations, are as follows:

1. Accelerate efforts to rebrand FSCN as a forest bio-product research center.
2. Expand industrial network into non-traditional chemical, materials and end-product companies, perhaps through the creation of a bio-products advisory council.
3. For each project, develop a publication plan that includes both industrial and high-level academic journals to ensure success in a broad range of funding programs; increase collaboration.
4. Focus resources towards advanced, high-value bio materials and integration with industrial design. Further, we note that KM2 is a unique opportunity that leverages strength in the Engineering Physics unit.
5. Increase efforts to be successful in the EU framework funding and in the fundamental science funding.
6. Further consolidate MIUN expertise and infrastructure into FSCN strategy.

7. Evaluate FSCN's research program within a future scenario planning process which could become the national standard for evaluating forest bio-product research initiatives.

UoA 7.2 Chemistry
Faculty of Science, Technology and Media

Experts: Prof. James Olson, Prof. Angeles Blanco,
Former Research Director Lars Gädda, Prof. Alison McKay,
Prof. Janne Laine, Prof. Bandaru V. Ramarao, Prof. Joachim Rosenthal
and Prof. Kerstin Witte.

General assessment of the UoA

Overview

The unit of chemistry consists of four disciplines, which are analytical chemistry, eco-chemistry, physical chemistry and organic chemistry. The sections are interconnected with collaborations and cross its respective disciplines due to the size of each section. Organic chemistry, physical chemistry and eco-chemistry are also part of the Fibre Science and Communication Network, FSCN.

The mission of chemistry has three components:

- 1) High level academic research
- 2) Co-production with industry, especially the paper industry,
- 3) Demonstration of new product concepts through personal engagement in the commercialization of research results.

Areas of strong research that have potential to grow stronger

Within individual units:

- The UoA is especially strong in organic chemistry with a focus on natural product chemistry and catalysis for environmentally benign processes and applications.
- Water chemistry is also a strong area.
- Those two areas have a big potential to grow further relatively quick.

Between units:

- The personnel working at Chemistry belongs to the department of Chemical Engineering and the department of Natural Science within the faculty of Science, Technology and Media. The research within physical chemistry, organic chemistry and eco-chemistry are also linked to FSCN.
- Basically, all areas in Chemistry have possibilities to become stronger by interdisciplinary research, since they can be connected to the university's core areas such as Forest as a resource.

SWOT Analysis

a. Strengths:

- The quality of the research is high (impact and citations of papers).
- Innovativeness is high (high number of patents).
- The basic research knowledge is utilized in applied research projects and in start ups.
- Most groups within the UoA have strong and close contacts to and collaborations with regional industry, as well as with the surrounding society.

b. Weaknesses:

- The funding situation is relatively good at the moment, but here is a lack of long-term stability.
- The UoA is very dependent on external funding.
- Connection between teaching and research is weak, as they are no advanced education programmes in most of their fields.
- There are only a few MSc students.
- There are very few junior faculty, post docs, and technicians.

c. Opportunities:

- Within the university, there are great opportunities in terms of cross-disciplinary scientific work.
- Since the university has a research program on MSc level (a program which puts large emphasis on chemical research), it is possible to identify and recruit PhD students to some of the groups.
- To improve the research collaboration on a national and international level. This would improve the overall situation significantly.
- To increase the fundamental research funding through the high level basic research quality.

d. Threats:

- Problems with attracting funding for fundamental research.
- Financial problems for the surrounding industry, not least the pulp and paper industry, are emerging.
- The university is focusing on other disciplines than Chemistry.

Quality of research

Grade: Very Good

Discussion (why this grade):

- The Chemistry Unit has a good regional visibility, and also, in some areas, the unit is well established internationally.

- In the UoA, there are several examples of excellent research with well-cited publications in high-quality journals presenting research at the frontier.
- Some parts of the research are under development although of good quality.
- The number of undergraduate students in Chemistry is low, which also impacts the intake of graduate students, and hence, the quality of the Unit. The target is to restart the chemical engineering/ chemistry undergraduate program with KTH.
- Weakness in quality is the lack of e.g. post docs.
- Another weakness to ensure high quality research is the lack of technical staff to maintain equipment.

Recommendations:

- To build a structure of technicians, Post Docs, senior PhDs, assistants and associate professors in the ecosystem for creating excellent research groups.
- An increased basic research funding is needed to guarantee the quality of research.

Productivity

Grade: Very Good

Discussion:

1. Volume of publications (journal, conference, student thesis, etc.) per FTE.

Reference to specific indicators.

- The average number of publications in Web of Science is currently around 12 per year, and given the number of full-time equivalent researchers, the UoA is highly productive.
- With very small groups, the number of papers per person impacts the number of papers per professor (if they had more PhD students, the professor would produce more papers).
- Funding is the limiting factor.

2. Balance of publications

- The number of conference papers is significantly lower than the number of peer reviewed papers.

3. Number of students graduated, staff promoted, ...

- The number of PhD examinations (7) is above average given the resources.
- Weakness in quantity comes partly from the lack of post docs.
- The number of graduated M.Sc. staff members is on the same level as the number of graduated PhDs.
- Several of the members of the groups have been promoted during the period: two docent promotions (associate professors) and two professor

promotions. In addition, one adjunct professor has been added to the UoA. Thus, the level of promotion is good.

- Professors of the unit spend 10-50% of their time teaching.

4. Volume of other measures of impact, companies started etc.

- A high number of patent applications.
- Two start up companies that are expanding at the moment.

Recommendations:

- To build a Master program, in which Chemistry has an important role.
- To find ways to increase external funding in order to gain the critical mass.
- To hire post docs, which would significantly increase the productivity of the unit.

Research environment and infrastructure

Grade: Excellent

Discussion:

1. Personnel (Staff profile, numbers, diversity, demographics, leadership, ...)

- Small self-managed groups, totally 9 PhD students in the unit.
- Few post docs.
- The UoA had a woman faculty member but she retired.
- The UoA have two engineers that provide teaching laboratory support but they also provide maintenance and training on equipment but do not run routine tests.

2. Research environment (Organization of groups, coherence, interdisciplinary, outreach, ...)

- Lots of co-supervision in the faculty.
- Some common projects with Chemical Engineering, Biology etc.
- Students need to take care of their own equipment such as NMR .

3. Infrastructure

a. Availability of equipment: within the UoA, within the university, industry, international networks

- The level of equipment and laboratories is high and very well-equipped.
- Limited access to some of the absolutely best equipment and state of the art infrastructure.

b. Age, plan for renewal, ability of renewal.

- A threat to renewal is future funding.

Recommendations:

- To ensure steady funding for technicians.
- To build a structure of Junior PhD, senior PhD and Post Doc is the ecosystem for creating excellent research groups.

Networks and collaborations

Grade: Good

Discussion:

1. Academic networks and collaborations (number, quality, ...):

- National co-authors are present in 70% of their publications and international co-authors in 15% of the papers.
- Mostly Nordic academic collaborations.
- National collaboration is very strong and includes most of the research universities in Sweden
 - Enabled successful national proposal competitions
 - Access to facilities
 - Can be over-shadowed by larger universities is the only negative.
- EU
 - Has a Eurostar grant
 - Has a collaboration network
 - Can access external consultants to assist in the administration - they cost 10% of the grant.
 - EU collaboration should be stronger
- Other international networks collaborations
 - Has some collaborations with:
 - United states, Australia, Canada, Japan, Israel
 - These include co-authors, exchanges, visits among faculties and students.

Recommendations:

- To increase national cooperation outside regional area.
- More EU projects/ cooperation are highly recommended.

Coproduction and external cooperation

Grade: Good

Discussion:

1. Industry collaboration / partnerships: national and international
a. number and quality of collaboration;

- The aim/strategy of the university is to have high co-production with the industry.
 - Reasonable collaboration with local industry and other society partners.
 - Work with a number of small companies and start-ups.
 - Good industrial collaboration regionally but could be stronger nationally (some funding sources can not be utilized in whole Sweden).
 - The research is obviously of value for partners.
 - Good start ups. Organo-click etc. This helps to get further collaboration.
 - EU co-production funding:
 - Startup has helped to attract EU companies + an Israel company and to create an EU proposal
 - There is some work with multi-national companies like SCA and BASF.
- b. Contribution of partners; benefit to MIUN UoA.
- PhD students are funded by industry.
 - Industry is co-funding through e.g. Vinnova, KK-foundation projects.
 - Industrial partners are utilizing patents.
2. Non-industry (other institutes, etc.)
- a. Government (City, Nation);
- b. Institutes
- Centre of excellence activities.
 - Cooperation with hospitals and Innventia.

Recommendations:

- To increase collaboration with (multi)national companies.
- To increase EU level collaboration.

7 Impact

Grade: Very Good

Discussion:

1. Comment on specific cases presented
 2. Other impact on industry, startups etc.
 3. Other impact on government, institutes and societies
- Both Organoclick and ChemseQ are excellent examples of how one can utilize fundamental research for new business openings. In both cases patenting and publications are combined, and are utilized both in university and startup activities.
 - Research in organic chemistry has led to the startup companies “Organo click AB” and “OrganoWood AB”. There are currently 18 people working in three factories. Next, the SME (Organoclick) engineers and researchers perform the reactions at a larger-scale at the big-companies

we are collaborating with. Thus, the reactions are scaled up from gram-scale to million-ton scale. Thereafter, the ready process is performed at the large factories and Organoclick AB exports their formulations around the world.

- Research in the Water Chemistry area led to a spin-off company, ChemseQ International AB, which was established by the five researchers in June 2010. In the beginning of 2012, MSEK 2.1 in venture capital was given to ChemseQ, and a pilot-scaled container solution for waste water treatment was designed and installed during the fall. The first trials started in December 2012.
- Most of the graduated PhD students have been recruited by regional and national industry, hence, supporting the societal impact of the Chemistry Unit. Furthermore, at present the UoA has some industrial PhD students, and the relatively strong project collaboration with the industry has a long-term impact on several industrial areas.

Recommendations:

- The industrial impact comes mainly through Chemical Engineering. The role of Chemistry vs. Chemical Engineering should be clarified.
- The average academic impact is very good. There are areas that should improve their impact by national and international networking.
- The future of startups has to be guaranteed (funding and personnel structure) to ensure their impact.

Strategies and plans for development of the Unit

Grade: Insufficient

Discussion:

1. Comment on SWOT

- Most of the relevant questions were mentioned in Chemistry Unit's SWOT analysis. However, the strengths of Chemistry Unit such as the fundamental and high impact research could have been articulated better.

2. Comment on specific plans for future

- The future development of the UoA is to increase the collaboration within the research groups. They also envision collaboration with the several other UoAs at both the research centers FSCN and STC and with national and international partners. This will lead to larger applications for funding and increased interdisciplinary research. The UoA is also focusing on increasing their hit score on proposals to the Research Council and other high-profile sources.

- The UoA feels that it has the quality but not the reputation (small university).
 - Complimentary research groups to expand: to hire new PhD students first, then post docs and finally to increase the number of faculty members.
 - The UoA also likes the idea of a technician but does not have a real strategic plan for that.
 - How to mitigate the risk of paper ?
 - Diversity in terms of the number of companies that the UoA is involved in.
 - Smaller companies may be the key
 - However, small companies will not fund research.
3. Comment on process for plan/SWOT development
- Needs to develop a clear, detailed plan and strategy for the future.

Recommendations:

- Since Chemistry should have more basic research targets than e.g. Chemical Engineering, it is quite natural that they should concentrate on novel areas of wood and cellulosic materials. Be more active in applications (more quantity of applications), also together with other universities such as KTH. It will give a possibility to increase the number of junior faculty in order to renewal / develop and increase.
- To join the new undergraduate program.
- Strengthen the existing group and ensure that there are people who can take over in future.
- The technician question has to be solved.

Recommendations for development

Recommendations:

- To hire more post docs to improve quality and quantity of the Unit. To build a master program, in which Chemistry has an important role.
- Be more active in applications (more quantity of applications), also together with other universities such as KTH.
- To ensure the UoA has steady funding for the technician, you should include more departments / research groups into a pool of funding.
- To increase national cooperation outside the regional area.
- More EU projects/ cooperation are highly recommended.
- To merge Chemistry and Chemical Engineering. The future of startups has to be guaranteed (funding and personnel structure).

UoA 7.3 Chemical Engineering Faculty of Science, Technology and Media

Experts: Prof. James Olson, Prof. Angeles Blanco,
Former Research Director Lars Gädda, Prof. Alison McKay,
Prof. Janne Laine, Prof. Bandaru V. Ramarao, Prof. Joachim Rosenthal
and Prof. Kerstin Witte.

General assessment

Overview

- There is a very high overlapping between the activities of Chemical Engineering, Chemistry and Physic Engineering. It seems that Fibre Science and Communication is an umbrella for some of the other units. The organization of departments and units is not clear from outside.
- Chemical Engineering UoA is a strength of the university. It has the largest group in Miun/Sundswall and the largest budget. It is divided in four clear and different groups which are complementary. The groups are highly inter and multi-disciplinary.
- The UoA covers fundamental and applied research. High Yield Pulping Technology is very applied while Paper Physic is very fundamental.
- High Yield Pulping Technology is a large senior group while the other groups are more equal with respect to the number of professors and PhD students.
- There is a high interaction and involvement of industry through industrial PhD projects, part-time researchers from industry and so on. As a consequence, there is a high volume of co-production and industrial indirect funding.
- The transfer of knowledge between university and companies is very good but this fact delays publication.
- Research is carried out at lab, pilot plant and full scale → high cost per paper.
- The strength and breadth of the people in the unit are uniquely positioned to play a leading role in the emerging forest bio-economy.
- There is no undergraduate teaching due to the decrease of students (they would like to re-start in 2015). Focus on graduate students.

Areas of strong research that have potential to grow stronger

- High expertise in specific, applied, well-focused topics (High yield mechanical pulping, biomaterials, extractives, lignin, polymers, energy savings, ...)

- Potential for radically re-thinking the expertise areas looking for new applications in other sectors.
- Potential for deeper studies.
- Move forward from traditional papermaking process.

SWOT Analysis

a. Strengths:

- Well-focused.
- Excellent industrial supported and co-produced research.
- Very high industry networking and integration. Good opportunities for research funding.
- High senior research level in some groups.
- Multidisciplinary.
- From lab to pilots and full scale research.
- Good transfer of knowledge.

b. Weaknesses

- Tied to conventional pulp and paper products industry that is facing an uncertain future.
- Relatively low international/European networking.
- No sufficient publications in Chemical Engineering journals.
- Low critical mass in Paper Physic and Gasification Groups.
- The gasification group shows a low integration with other groups and areas.
- Decoupling of education and research in chemical engineering area.
- Much work is co-produced with industry, which can be a weakness because of confidentially agreements, publication in technical journals, delayed and slow publication process, industrial driver > lack of a detailed publication plan and few opportunities to complete the part of fundamental research.

c. Opportunities

- Potential for improving the publication rate and the quality.
- Wider focus of research looking for applications in other sectors.
- Further develop fundamental research areas.
- Look for EU fundings.
- Further collaboration with academia and industry at international level.
- Re-inventing chemical engineering opportunities for education and research.
- Find a role and become leaders in the bio-based EU economy.

d. Challenges

- Renewal ability.
- To survive in a traditional sector that it is in a decreasing market.
- To move quickly towards a growing market sector.
- Coupled teaching and research.
- To move from a traditional way of applied research based on optimization towards the development of more fundamental knowledge.
- To keep the strength of the group in a low funding environment.
- To build strong clear identifiable research areas for the units.

Quality of research

Grade: Very good

Discussion:

- Relatively young research groups with a very good national visibility and reputation. Recognised at international level.
- Quality of publications:
 - Good examples of excellent academia and research. Awards and prizes for outstanding research from industrial/academic societies, spin-off companies.
 - Fundamental research of high quality, for example in the Paper Physic Group, which publishes in journals with a medium-high IF for Chemical Engineering standard.
 - Applied research is of excellent quality from the point of view of their application and implementation at mill scale (optimization of process for higher yield, lower energy consumption, better products and so on) published in technical journals of lower impact factor. They need to produce wider and deeper knowledge.
 - Average IF of the journals is 1,45 (relatively low).
 - Very few publications in Chemical Engineering Journals.
- Ability to achieve and present science
 - Very high number of presentations in high quality conferences.
 - High co-production.

Recommendations:

- Crucial to pursue fundamental research to assure the future of the unit at long term.
- To publish applied research in higher impact journals to increase the probability of getting funding for fundamental work.
- Clear fundamental research lines at long term complemented with industrial projects but avoiding industry to fully drive the research areas

due to funded limitations in order to build a bridge between applied research and the related fundamental aspects to get a deeper knowledge in parallel with the results from the industrial projects. Look for complementary funding.

- To find long term fundamental research needs for future applications.

Productivity

Grade: Very good

Discussion:

- Volume of publications:
 - Average number of publications per professor because there is not an equal distribution of productivity between all professors. There are 4-6 very productive professors.
 - Industrial co-production delays the publication process.
 - 12 PhD thesis → 2/year
- High impact on reduction energy consumption in pulping production. Creation of 2 spin-off companies.
- High rate of conferences.
- No undergraduate teaching. It is planned to re-start the chemical engineering program.
- Direct industrial funding is relatively low but it is high in in-kind, which is what pays PhD students.

Recommendations:

- To increase the rate of publications per FTE.
- To develop a medium term publication plan of both technical and fundamental results. In this way, with high citation records, they may get more funding for fundamental research.
- Define a fundamental research program parallel to the applied actual new program with clear objectives.

Research environment and infrastructure

Grade: Excellent

Discussion:

- Interdisciplinary profiles of personnel, good and senior leadership in most a groups.
- Coherent groups within the unit with collaboration with experts from other units.
- Infrastructure:

- Very good availability and adequacy of infrastructure within UoA, within university, industry and international networks. Availability of research from lab and pilots to industrial sites. Good use of external resources.
- Successful funds raised in regional funding from EU. Need of national and international funds for renewal: need to have a very clear / sharp research plan.

Recommendations:

- Look for funding in EU (Horizon 2020) and Swedish Research Council for fundamental research by increasing the networking, collaborating with other academic organizations.
- Invite post-docs to contribute to the development of new ideas.

Networks and collaborations

Grade: Good

Discussion:

- Good academic networks and collaborations at national level, very good within Scandinavian countries but very low at EU level.
- Excellent industrial networks with traditional industry.

Recommendations:

- Increase the academic international networks:
 - Develop medium term exchange of staff and students (3-6 months).
 - Open new fields for collaboration by application of expertise on new areas (composites, energy, bioproducts, process development, water/waste management, logistics...).
 - Broaden the industrial network to include more than traditional industry to support the strategy to play a leading role in the emerging forest bioeconomy, e.g. biomaterials and bioproducts (BASF, Dow, Dupont, DSM, ...).

Coproduction and external cooperation

Grade: Excellent

Discussion:

- Coproduction is excellent. Opportunities for double employment with industrial experts working half time at the university.

Impact

Grade: Very good

Discussion:

- Very high impact with respect to industry and society in general at short term.
- High impact with respect to academia.

Recommendations:

- To broaden the business network to include non-traditional forest companies, perhaps, by creating a bio-industry advisory committee.

Strategies and plans for development of the Unit

Grade: Insufficient

Discussion:

- Very good analysis of the current situation. Well identified areas with opportunities but no strategy or concrete plan about how to achieve the identified challenges.
 - a. High yield pulping technologies: Re-focus of the research on new sectors → collaborate with other groups, widening current collaboration and creating new national and international networks and collaborations (water chemistry, wood polymers, engineering physics,...), widen the industrial network towards new sectors.
 - b. Water chemistry: Increase of co-production, stronger networks at national and international level, guest professorships and post-docs, collaboration with other sectors (environmental technology, mining, polymers, electrochemistry, chemical companies, etc.).
 - c. Paper Physics: maintain a critical mass and develop new networks.
 - d. Gasification: increase the number of senior researchers, improve regional cooperation, develop energy engineering to a research subject, and favor co-production.

Recommendations:

- Develop a research strategy for 10 years.
- Develop an implementation plan for 10 years.
- Allocate resources for planning and implementation: Specific time and staff dedicated to create new business areas and re-designing the research activities.

For example:

- Develop the Industrial Symbiosis concept.
- Develop energy engineering research subject.

- Improve national and international networking.
- Once the potential re-focused objectives for medium-long term have been identified, try to get funds for the new areas.

Recommendations for development

Grade: Insufficient

Discussion:

Recommendations:

- Establish a web site for each unit.
- Develop a detailed medium-long term strategic plan and ensure that the strategy is aligned with FSCN's strategy. Allocate resources to implement the plan quickly:
 - Develop a research strategy for 10 years.
 - Develop an implementation plan for 10 years.
 - Allocate resources for planning and implementation: Specific time and staff dedicated to creating new business areas and re-designing the research activities.
 - Define long term fundamental research needs for future applications.
 - **To develop a medium term publication plan of both technical and fundamental results in parallel.**
 - Once the potential re-focused objectives for medium-long term have been identified, try to get funds for the new areas.
- **Crucial to pursue fundamental research to assure the future of the unit at long term:**
 - Clear fundamental research program complemented with industrial projects but avoiding industry to fully drive the research areas due to funded limitations.
 - **Build a bridge between applied research and the related fundamental aspects to get a deeper knowledge in parallel with the results from the industrial projects.**
- To publish applied research in higher impact journals to increase the probability of getting funding for fundamental work.
- **Specific time and staff to create new business areas and re-designing the research activities.**
- To increase the rate of publications per FTE.
- Look for further funding in EU (Horizon 20220) and Swedish Research Council for fundamental research by increasing the networking, collaborating with other organizations.
- To invite post-docs to develop new ideas.

- Increase the international (EU) networks and collaborations through increased conference participation, encouragement of students and post-docs to work internationally, etc.
- Broaden industrial network to include more than traditional industry to support the strategy to move towards biomaterials and bio-products (BASF, Dow, Dupont, DSM, ...).
- Develop medium term exchange of staff and students (3-6 months).
- Open new fields for collaboration by application of expertise on new areas (composites, energy, bio-products, process development, water/waste management, logistics...).
- Renewal of knowledge.
- Develop the Industrial Symbiosis concept.
- Develop energy engineering research subject.

UoA 7.4 Mathematics Faculty of Science, Technology and Media

Experts: Prof. James Olson, Prof. Angeles Blanco,
Former Research Director Lars Gädda, Prof. Alison McKay,
Prof. Janne Laine, Prof. Bandaru V. Ramarao, Prof. Joachim Rosenthal
and Prof. Kerstin Witte.

General assessment of the UoA

Overview

Mathematics research conducted at Mid Sweden University is organized around 4 different research units, each headed by a full professor. The 4 research groups are:

- Computational mathematics and physics
- Complex analysis
- Differential equations and multiscale analysis
- Mathematical physics.

The range of research conducted in these 4 units covers both subjects of pure mathematics and applied mathematics. Complex analysis (headed by Prof. Porten) is a traditional area of pure mathematics which has a long tradition in the Scandinavian countries. The complex analysis group at Mid Sweden University represents this tradition well and some of the research of this group is published in some of the leading mathematics journals of the world. Beside Prof. Porten, there are 4 Assistant Professors in this research unit.

The research group in mathematical physics (headed by Prof. Schiebold) covers timely questions of theoretical nature in physics. The research is pure in its nature and of high level as recognized through publications in some of the leading journals in mathematical physics. The research group itself is very small, essentially consisting of Prof. Schiebold and one PhD student who recently graduated.

The research group in differential equations and multiscale analysis (headed by Prof. Holmbom) is concerned with applied questions involving partial differential equations. Beside Prof. Holmbom, there are 4 Assistant Professors in this research unit. Finally, there is the computational mathematics and physics group (headed by Prof Edstrom). The main focus of the group is on applied computational problems. The research of this unit is conducted in collaboration with researchers in physics and mechanics and a large part of the research is driven by some focused projects coming from applications. The unit's impact is strong in the optical area of Physics. In the discussions, a deeper problem in the positioning of the UoA surfaced. It seems that both in Sweden as a whole and at Mid Sweden University in particular, there is a sizable pressure on the mathematical researchers to conduct less mathematical

subject research and instead to become involved in some focused applied projects. This committee thinks that this is a dangerous path. Indeed, Mathematics is a crucial tool for many scientific and engineering research activities at Mid-Sweden University. Having a strong knowledge base for fundamental questions of mathematics is hence the basis for high level advances in many applied sciences. In this regard, we would like to point out that there is no top university in the world which has not also got a top level mathematics department, and one can easily turn the argument around.

1.2 Areas of strong research that have potential to grow stronger

Within the areas of pure mathematics, the group of complex analysis has, by tradition and size, the largest visibility in the UoA and conducts research at a very good level. Within the area of applied mathematics, a similar argument can be provided for the computational group, which is strongly linked to other units of the university. We are, however, not recommending that additional researchers are added to one of these two units. As a matter of fact, by all measures, the number of full time equivalents (FTE) compared by international standards is rather low in the UoA. Many Universities in Europe with a similar student body size have many more professors and PhD students in the mathematical area. In addition, at Mid Sweden University many research areas are completely absent. Subject areas like Algebra, Algebraic Geometry, Discrete Mathematics, Number Theory, Probability Theory, Topology and Statistics are to a large degree missing in the UoA. Professor Schiebold represents the area of mathematical physics as a single researcher (a PhD student of hers graduated recently). Even worse, many of the Assistant Professors seem to be absorbed with tasks of teaching and seem not to have the required time to pursue research on high level. As outlined in the assessment report, 41% of the publications come from the top 3 people in the UoA. On the positive side, one should stress that the majority of the publications was in peer reviewed journals and a few of the papers were published in the absolute best journals of the mathematical literature.

1.3 SWOT Analysis

a. Strengths:

Some of the mathematical research conducted at the UoA is on a high international level. With essentially 5 FTEs, the unit produces a recognizable and good size research output. The computational science group is well integrated with applied projects of other departments. The whole unit supports the teaching effort of the university well on the different campuses and also through innovative e-learning. The UoA has trained few doctoral students but all developed strongly.

b. Weaknesses

The research is not sufficiently supported by national and European funding agencies. The 8 Assistant Professors have comparatively little international experience and many of them have not seen much more than Mid Sweden University. Because of the lack of external funding, the Assistant Professors are lacking the time to do research and are overloaded with teaching assignments. There doesn't seem to be enough funds, which would allow the Assistant Professors to attend professional meetings and there also seems to be no funds to invite experts from other Universities. The number of students majoring in mathematics is critically low in particular on the Master and PhD level. The small size of the Department also makes it difficult to build up an attractive broad program of study. As a research unit, the UoA cannot be recognized as such on the web and that certainly does not help to attract Master and PhD students.

c. Opportunities

On the computational side, there is already a good collaboration with other research units. There are many possibilities for all researchers of the unit to get involved in cross-disciplinary efforts.

Mathematics is critical in the progress of many research areas. This is underlined by the fact that there are many mathematicians who received a Noble prize, even though there is no Noble prize in mathematics. It is also clear that a strong mathematics education is crucial in the training of many researchers and the UoA plays an important role here. The UoA also has unique experience in the area of e-learning and that should give opportunities to broaden the scope of this effort. The latter effort potentially might also get support by grant agencies and even from private money sources and that can ultimately also help the research effort as it will potentially bring money for assistants and research results can be communicated to a wider audience.

d. Threats

Many of the Assistant Professors have a good research profile in pure mathematics with few publications. These people are now lacking the time and the research funds to further develop their research portfolio. They also have few opportunities to go to professional meetings or talk to visiting researchers in their subject area. As a result, it is likely that they will not be ready for promotion to a higher rank for many years, if at all.

As the number of Master students is very low, there is the threat that the Master program is not viable anymore.

Quality of research

Grade: Very Good

Discussion (why the grade):

Some researchers of the UoA have been published in some of the best journals of mathematics. In absolute top journals of the area of pure mathematics publications appeared in *Annals of Mathematics*, *Duke Journal*, *Crelle Journal* and *Mathematische Annalen*. In the top journals of the area of applied mathematics and mathematical physics members of the unit were published in *SIAM Review* and *Journal of Mathematical Physics*.

The breadth of research areas in the department is small and it reflects the very small size of the department.

The research is very good in a few areas of pure mathematics, such as complex analysis and mathematical physics, having national recognition and international visibility with publications in high impact journals. They would also be recognized as national leaders in the few key areas of pure mathematics.

The applied mathematics work is between good and very good and appears to be trending towards very good. The number of publications has increased since 2007.

Some of the computational science work is very applied and in many universities the work would occur in a department like a physics department or a mechanics department. In this regard, we would like to mention that the American Mathematical Society (AMS) reviews most papers in pure and applied mathematics. There are, however, many papers coauthored by the members of the UoA who are not reviewed by the AMS as the journals where the papers appear are considered to be outside of mathematics.

Recommendations:

Assistant Professors need to have sufficient research time to develop and be promoted within the system. They should also be given the opportunity to attend professional meetings from time to time.

The UoA lacks sufficient funds to invite top researchers for a seminar or a research stay.

The external research funding is weak, in particular in the pure areas of the UoA. Efforts should be made to increase this funding to permit Assistant Professors and lecturers to have more research time to maintain high quality research. This can be done e.g. by:

- increasing the application efforts to the National research council and other national funding opportunities
- becoming involved in efforts of proposals for international research networks

- bridging the gap between pure and applied mathematics. Grant applications, which will enable partnerships with applied profile projects, should be encouraged.

The unit has a lot of experience in the area of e-learning. Innovative learning methods have been supported both by government and private funding agencies. The unit should explore the possibility to attract funding support in the general area of e-learning. Using e-learning could free up time for research by reducing contact time with students, especially in remote locations, and if the group developed e-learning resources based on their research results then they could be a means of delivering impact to a wider community.

The unit also seems to have a strong track record in the didactics of mathematics. In combination with e-learning, this could also mean opportunities to attract outside funding for these efforts.

Productivity

Grade: Very Good

Discussion:

With an average of about 5 FTE in the last couple of years, the UoA has published 6.95 publications per year in level 1 journals. In particular in the area of pure mathematics this is a very good record, both in quantity and quality. For this reason, we give the unit the grade very good in this category.

The number of PhD and Master students which are present in the UoA or who have recently graduated are clearly below the expected national and international average with respect to the FTE research staff. The reason for the low numbers appear to be the low availability of subject research funding.

There is only about one Master student in a given year of studies which is below expected.

All senior staff members have been promoted to Full Professor. The Assistant Professors have had no promotion in the last 5 years which seems appropriate given the years since their PhD.

The total research production by the UoA is relative small since the total unit is simply small. To underline this point and for comparison reasons we looked up some other universities. At ETH, which is considered a top level school in Europe and where the number of students is about 17,000 the situation is as follows: The total number of mathematics researchers with a title of professor is about 40. As an example of a more regional university we randomly had a look at Chemnitz Technical University in Germany which has about 10,000 students. At Chemnitz, the research is organized around 15 subject areas, each headed by a professor. These numbers show that the number of professors and the breadth of the research at the UoA is very small in comparison with the size of the university and this lack of breadth in the mathematical area is certainly a handicap for several research efforts at MIUN.

Recommendations:

To increase the number of PhD students, the unit should increase its efforts to obtain additional external funding. This can e.g. be done through:

- international joint graduate schools programs (if such exists)
- applied research in partnership with profile research proposals
- trying to set up more exchange programs with some partner universities.

In order to increase the number of Master students, a good presentation on the web is an absolute must. Prospective Master students should see that there is a Mathematics Unit at Mid Sweden University and that it is attractive to pursue a Master degree there.

The university should seriously consider adding some subject areas like Algebra, Discrete Mathematics, Probability Theory or Statistics as expertise at the university.

Research environment and infrastructure

Grade: Good

Discussion:

1. Staff: The research is driven by 4 full professors who pursue research in their fields. The Assistant professors are absorbed with a lot of teaching and they lack guidance, international experience and time to advance their research reputation.
2. Research environment: There is little interaction between the 4 units and with the exception of the applied computation group; there is little interaction with other units of the university.
3. Infrastructure: Mathematics does not require a large infrastructure. Access to computing infrastructure seems to be good and the people seem to be happy with the access to library resources.

Leadership: The senior professors realize the essential problems the UoA is facing. However, there is not enough strategic thinking about ways to improve the situation.

Recommendations:

- Formally create a department of mathematics that is visible and identifiable from the outside. This can be done despite the fact that the 4 Professors are housed at three different campuses.
- Get a strategic plan in place which addresses the problems of the Assistant Professors.
- Get a plan in place on how the lack of funding can be overcome.

Networks and collaborations

Grade: Good

Discussion:

1. Academic networks and collaborations:
 - University: The computational science group interacts well with other units at the university. Beyond this, the interactions are limited.
 - National: There are national contacts with several Swedish Universities in the area of complex analysis and the area of computational science.
 - International (EU, else): The complex analysis group and the mathematical physics group have collaborations with a few European Universities. The cooperation with The Norwegian University of Science and Technology (NTNU) concerning advanced courses and PhD courses is applauded.

Even though some of the senior professors are well connected to some partners in Europe, we feel that there is a complete lack of mobility. Most Assistant professors graduated at Mid Sweden University. Their experience to work at a foreign university is small or not existing. We did not see that Master or PhD students who graduated from the UoA were placed at some top research places in the world or that foreign exchange students were spending time at the UoA.

Recommendations:

The UoA has to become visible as an entity where high level mathematics research is done and where it is attractive to spend time as a student or as a researcher.

- The senior professors should encourage students and junior researchers to spend time at foreign centers as part of an Erasmus program for example.
- The University should allocate resources which will help the UoA to bring in talent to the University on all levels.
- Within the University, the junior professors should brainstorm more how to start collaborations with other units at the University.

Coproduction and external cooperation

Grade: Good

Discussion:

In the mathematical sciences, there is collaboration and consulting with industry e.g. in the areas of Statistics, Operations Research, Scientific Computing and Cryptography. Only the computational group falls in one of the above mentioned categories and the computational group indeed has very good industry contacts.

Consulting with government agencies seems to be absent. Again, this is not surprising as the UoA is not covering the expertise which governments often ask for (Statistics, Operations Research and Cryptography).

Recommendations:

No particular recommendations.

Impact

Grade: Very Good

Discussion:

The self assessment report of the UoA showcases two applied projects where the UoA had a very positive impact. The first case concerns a problem arising in optics. The second case is concerned musculoskeletal simulations in sports. Both cases show how mathematics in general and the UoA in particular have a positive impact on research questions in society.

Recommendations:

No particular recommendations.

Strategies and plans for development of the Unit

Grade: Good

Discussion:

In the self assessment report, the UoA mentions the goal to team up with the Norwegian University of Science and Technology (NTNU) concerning advanced courses and PhD courses which we find a good idea. The question if more members and in particular the junior faculty members should get involved in focused applied projects is also addressed.

We feel that the senior members of the UoA realize some of the pressing needs. There are, however, little thoughts put in the process on how to improve the situation.

The most pressing problems with possible solutions are as follows:

- Making the unit a more attractive place for Master and PhD students. For this, the unit first needs to be recognized as a place where a prospective student wants to go for studies. Currently, a few students are attracted as they know MIUN as a University or because they know a particular professor. However, the visibility on the web is essentially absent and this should be corrected.
- The junior faculty is locked in a situation where the teaching load is high, the time to do research is little and the opportunities to attend professional

meetings are few. This is not the basis for strengthening the research portfolio, which is the basis to attract external funding or to become ready for promotion. We believe that the University needs to help here. On the organizational side, each junior faculty should have some coaching by a senior faculty on a regular basis. It would also be helpful for these junior faculties to have sabbatical opportunities where they could visit some foreign centers and have ample time to do research. A minimum amount of money to attend professional meetings should be available.

- **Funding:** Even though funding of mathematical research is not as plentiful as in subjects where industry is eager to outsource research, we believe that the external funding of the UoA is small and should be increased. Subject oriented funding in Sweden and Europe as a whole is very competitive. Nonetheless more efforts should be done to get such funds. In particular, the researchers in differential equations and computational science have the possibility to collaborate on focused projects in the applied sciences and that should provide resources to support some PhD students in the applied sciences. One strength of the unit is their expertise in e-learning. This could well be the basis of funding of some government agency or even some private foundation as the topic of new and innovative teaching is high on the agenda for many funding agencies.
- **Mobility:** The international exposure of postgraduate students and junior faculties is very limited. A small university makes itself a dis-service by simply hiring its own students, even if they seem to be very strong.

Recommendations:

The University should consider to create a formal Department of Mathematics even though the 4 research groups are spanned over different regional campuses. The very minimum is a clear description on the web.

The university administration as well as the senior faculty should help in guiding the career path of the junior faculties. For this, a regular coaching of the junior faculties is recommended. The University should think of ways on how research time can be increased for junior faculties.

The professors of the UoA should increase their efforts to get third party funding. In order to make MIUN a more attractive place for mathematical research, it is recommended that the University allocates some funds for visiting researchers.

The UoA should come up with a plan which helps increasing the mobility of the students, both students at MIUN and students who visit MIUN.

Recommendations for development

Discussion:

With the current resources the UoA has enough funds to cover the teaching tasks at the different branches of Mid Sweden University. The resources are however not enough to progress on high level international research in pure or applied mathematics. The clear danger here is that the junior faculties stop doing subject oriented research and either do no more research at all or help out as consultant in some focused applied research projects with little intrinsic mathematical value. The education at the postgraduate level is at a critical level.

Recommendations:

The UoA will require a considerable increase in resources in order to fulfill its mission at Mid Sweden University. Many universities of similar size allocate many more FTE positions for mathematics than what is done at MIUN. Indeed, we are not aware of a top university which has not also got an excellent mathematics department. For example Berkeley, Harvard, MIT, Princeton and Stanford all have top-notch mathematics departments and the same is true for many highly rated Universities in Europe.

A mathematics department doing research in a broad range of subjects is a key knowledge source for many researchers of a highly rated university. A mathematics department also has got the important task to educate a large student body in the foundations of mathematics and this serves many research units in the applied sciences well.

UoA 7.5 Sports Technology
Faculty of Science, Technology and Media

Experts: Prof. James Olson, Prof. Angeles Blanco,
Former Research Director Lars Gädda, Prof. Alison McKay,
Prof. Janne Laine, Prof. Bandaru V. Ramarao, Prof. Joachim Rosenthal
and Prof. Kerstin Witte.

General assessment of the Unit

The group has well-equipped laboratories for Biomechanics and Performance Optimization, Human and Equipment Interaction and Additive Manufacturing and Materials. These are currently used to support substantive activity in the development of sports equipment solutions leading to strong impact through the creation of new products. There is also substantive work applying additive manufacturing technologies to problems in sports equipment and surgery.

Overview

Significant effort has been devoted over the last 10 years to the development of a sports technology lab facility that makes the group well-placed for future research activities in comparison with other international Sports Technology research groups. Overall, we rate the research as Very Good because the applied research has high impact and the facilities are excellent; this is what makes the group well-placed for future research activities in comparison with other international research groups of Sports Technology.

Strengths include broad national and international collaboration with industry, societies and academic institutions. This way, the Unit has several possibilities to grow. The evaluators found a high potential for fast growth exploiting facilities and links that have been established. However, in the many collaborations and projects, there is a serious lack of long term planning and academic leadership for the coordination of all projects is limited. The development of general methods for Sports Technology is a further opportunity.

Areas of strong research that have potential to grow stronger

In terms of the individual units, the following areas are the ones with the highest potential for growth.

- Additive Manufacturing capability: equipment is in place and a technician who can handle the machine is in post. Potential growth areas: use in more fundamental research, such as with materials scientists (developing amorphous metal and Additive Manufacturing of functional materials) and digital printing.

- Textile testing facilities: the group has established an excellent facility for the testing and verification of textile-based sports equipment. Potential growth areas: use by industry to test new products and in the development of longer term research partnerships.
- Performance optimization lab: athletes' performance and interventions can be evaluated and used to inform the design of performance-enhancing training and sports equipment. Potential growth areas: use to enable more fundamental research on performance and potential interventions, e.g. with Sports Science.
- Staff members across the units collaborate effectively to deliver applied research with high impact. Potential growth areas: more fundamental research, e.g. across interfaces, to better understand the nature of interfaces and build capacity for the future.

SWOT Analysis

a. Strengths:

- The high level of qualifications of the group's research leaders and research personnel lead to high quality of research.
- Working multidisciplinary allows collaborations with many disciplines (Material Science, Mechanical and Electronical Engineering, Medicine and Sports Science).
- High hit rate on applied projects and funding.
- International academic networks.
- The external research funding helps to build the research environment. This way, the strong laboratory infrastructure gives the PhD students good experimental possibilities.
- Synergies between the professors promote the research.
- High visibility in a number of industry sectors and society.

b. Weaknesses

- National academic networking.
- It is difficult to guarantee PhD students employment until dissertation because most of their funding comes through industrial projects and not from faculty grants.
- Coordination of all projects.
- Low impact factor of publications.
- Lack of focus on theoretical aspects of the research with respect to fundamental research.
- Large range of projects diffuses focus.
- Balance between short and long term projects.

- The Unit has poor visibility in the academic community. For example, the Unit does not have a web site and the academic case for categorizing the Additive Manufacturing activity related to surgical practice under Sports Technology is unclear.

c. Opportunities

- Infrastructure that has been established in the last 10 years (including laboratory facilities and staff, international academic networks and connections with companies) could be used to underpin externally funded research projects (both basic and applied research) and make the group well-placed to act as partners in EU Horizon 2020 funding proposals.
- Synergies between professors could lead to new initiatives.
- A Miun-based centre of excellence in Sports Technology/ Engineering (bringing together Sport Technology and Science) could be established.
- Methods developed in parallel with the development of the laboratory spaces could be a key reason why national and international academics and industrialists might wish to partner with Miun researchers in this area. Research on the methods themselves could be delivered through such partnerships.

d. Threats/Challenges

- The academics have a tendency to prioritize responding to external drivers. This has a detrimental effect on the time available for the development of fundamental research areas.
- There was evidence of a lack of strategic thinking and planning for the medium and long term.
- A strategic plan for the development of both applied and fundamental research, and allocation of people to deliver it, is needed to ensure that all aspects of research are prioritized within the unit.
- Staff not prioritizing time to cover all aspects of a healthy academic research activity.

Quality of research

Grade: Very good

Discussion:

The research is heavily application driven, with less focus on what the Unit has identified as its key research challenges. The research activities focus on three topics (Biomechanics and Performance Optimization, Human and Equipment Interaction, and Additive Manufacturing and Materials) in two core application domains: sports equipment & technologies and surgical implants. Highlights of the research activity

are the EBM additive manufacturing method from amorphous metal (bulk metallic glass), the laboratory facilities that have been established, developments in sports equipment and application of EBM to research on surgical implants.

The high number of international and national collaborations is excellent and external funding from the industry is very good. The evaluation team concurs with most points raised in the self-assessment SWOT. A key area for immediate attention lies in developing funding streams that include support for fundamental research activity to complement the more developmental work of the Unit. The Unit has equipment for movement analysis (e.g. motion capturing system) which could be used to address many research problems resulting from sports science that would be more fundamental in nature. In addition, the Unit could evaluate its developed products and products from industrial partners.

Academic outputs in peer reviewed journals are low but the number of conference publications and innovation outputs in the form of products and patents is high. In part, this could be a consequence of commercial needs to maintain confidentiality, but to develop its scientific standing, it is essential that the Unit maintains its profile in high quality academic journals. Most of the Unit's publications are practice-orientated but correspond to the common level of publications in the field of Sports Technology. The articles are published in the usual international journals and the Unit has wide participation in the academic community through, for example, keynote talks, expert contributions to research councils and foundations, and editorial/reviewer roles for international journals. Given its achievements to date and future plans, the Unit is well placed to devote more attention and resources to publishing review and overview papers in international journals.

Recommendations:

Based on the discussions above, we recommend that the Unit:

- targets more publications towards higher impact journals in Sports Technology and wider areas;
- increases its focus on and volume of activity in theoretical aspects of Sports Technology;
- increases its collaboration with the Department of Sports Science.

Productivity

Grade: Very Good

Discussion:

The Unit currently has seven permanent researchers (5 FTE for research) and 1.75 FTE temporary researchers. The research spending (including both cash and in-kind contributions) of approximately SEK 15M per annum (SEK 3M per professor) is relatively high, although it is not clear from the report what proportion of this

is in-kind support, and a wider range of funding sources would reduce the Unit's exposure to financial risks. The number of publications is, on average, three per year per professor but less than one of these papers per year is in a peer reviewed journal. The number of citation indicators is low. In relation to the number of professors, the number of postdoctoral researchers and PhD students are low; this has a knock-on effect on the number of promotions. The Unit has generated a relatively large number of patents and at least one start-up company is expected soon.

Recommendations:

Based on the discussions above, we recommend that:

- permanent staff members within the Unit prioritize the production of more and higher quality publications;
- the Unit includes funding for more PhD students and post-doctoral researchers in its future research strategy and delivery plans.

Research environment and infrastructure

Grade: Very Good

Discussion:

The Unit has excellent equipment in laboratories that have been developed over the past ten years, including an advanced textile laboratory, which was established by the Sports Research Group in 2010-2011, with the help of EU funding. In addition, a wind tunnel that will support an internationally leading capability in the simulation of skiing on inclines has been designed in collaboration with Loughborough University in the UK; the Unit is currently raising funds to install this facility. These facilities have been developed through application to projects involving sports technology and surgical implants but are not yet used to support more fundamental research. The ownership of these facilities makes the Unit well-placed to partner with other organisations to carry out more fundamental research in Sports Technology and underpinning scientific methods and tools.

The Unit is divided into groups with connections to external partners, including other research groups and industrial partners (local, national and international). Many projects are multi-disciplinary. The percentage of PhD students in relation to the number of professors is low; more external funding is needed to develop this area. The research environment is characterized by a lot of national industrial and a lot of international academic collaborations. In addition, collaborations with other Units of the University exist. A common usage of equipment together with other departments is given (e.g. Material Science, Sports Science). The EBM method is applied to specific biomechanical and orthopaedic surgical problems and the scientific level of this research field is very high. More applications beyond roller skiing to sports equipment are possible.

Recommendations:

Based on the discussions above, we recommend that the Unit identifies more sports equipment applications beyond roller skiing.

Networks and collaborations

Grade: Very good

Discussion:

The Unit has a large and varied collection of external partners. These include international and national networking activities in both student education (e.g. exchange of teachers and students with Canberra University, Padova University, Novosibirsk State University through a "Virtual classroom") and research (e.g. Swedish universities, RMIT, Melbourne, textile-oriented research on sports garments in Australia, universities in Italy (Padova and Torino) and Germany). The Unit also collaborates with a range of different kinds of external partners on the use of research equipment, e.g. cooperation with Stockholm University (Prof. James Cheng, Prof. Daqing Cui) and engagement with international and national sports organisations and Olympic committees (including the Chairperson of the IPC Alpine Skiing Sports Technical Committee, Swiss Olympic Medical Centre, US Olympic Committee and the International Sports Engineering Association (ISEA)). In addition, the Unit engages with healthcare providers in their application of Additive Manufacturing to surgical applications. Given the number of staff available to support and develop these relationships, the volume of external projects could lead to a situation where too much staff time is dedicated to developing external relationships and therefore reducing the time available for other activities such as publications and basic research.

Recommendations:

Based on the discussions above, we recommend that the Unit:

- determines which partnerships are of strategic importance to its future research strategy and directs effort to consolidating and developing these relationships;
- further develops its cooperation with the Sports Science activities at Miun.

Coproduction and external cooperation

Grade: Excellent

Discussion:

The Unit has a large number of non-academic partners, mostly from the industry. As a result, there is a diverse range of research projects covering a range of application areas and underlying engineering science where practical problems of sports

technology are addressed. Much of the funding from industry is in-kind, e.g. access to equipment, databases, software and laboratories; while this is an effective way of supporting individual projects, too high a proportion of this kind of funding jeopardizes the Unit's ability to deliver more basic research that will be key to its long term sustainability. Researchers in the Unit cooperate with surgeons in its medical implants work but the majority of its work is with sports-related organisations. The intellectual rationale for supporting the surgical work from the sports technology area is tenuous and would benefit from wider consideration; possibilities might include usage of EBM for the design of sports equipment, modelling of interactions between human and equipment and practical evaluation of products, focusing on sports injuries and their prevention, materials development or wider engineering initiatives.

Recommendations:

Based on the discussions above, we recommend that the Unit:

- includes in its future research strategy and delivery plans more coproduction of publications with external partners;
- leverages its excellent external cooperation and unique geographical position to underpin deeper, more fundamental studies and focused research;
- and University explore ways in which the research on medical implants will be taken forward in light of its research strategy.

Impact

Grade: Very Good

Discussion:

Products resulting from the Unit's research (both in sport and surgery), developed through a series of innovation projects, are likely to have a high impact on society; the self-assessment report and discussions in the evaluation meeting included strong evidence of this. For example, staff members of the Unit have designed and manufactured a Multifunctional Roller Ski Prototype, using the Additive Manufacturing Laboratory to build prototypes for testing and the Performance Optimization Laboratory to evaluate its efficacy; current results indicate that this product could be of importance for both competitive sports and leisure activities.

Researchers from the Additive Manufacturing Group in cooperation with the Swedish companies Exmet AB, ARCAM AB and Öhlins have succeeded in making what is currently the world's largest sample of iron based bulk metallic glass (BMG, or amorphous metal), using electron beam additive manufacturing technology. The potential impact of this research could be significant for future industrial and biomedical applications. The Unit won the "Best Innovative Part" prize awarded

by ARCAM User Group meeting participants (EXMET AB) in 2012 (EXMET AB is a research based materials company in Sweden). A number of companies have been formed as a result of Masters theses and other work: e.g. Techsled and Techsled Pro (winter sport device), Marshblade AB (special rollerblades), Kuzmin Ski Technology AB and Sensible Solutions AB.

Innovation activities related to sports and sports equipment have diversified into the development of equipment and techniques for disabled athletes. For example, physiological test methods for athletes with disabilities have been developed through collaboration between the Unit and the Swedish Winter Sports Research Center. In addition, technological solutions for special winter sport devices, adjustments, and prostheses for the disabled have been generated.

In summary, the potential impact is high and many opportunities for impact exist but more focus on the realization of this impact is needed.

Recommendations:

Based on the discussions above, we recommend that the Unit:

- conducts an audit of impact opportunities and forms a Commercialisation Advisory Committee including leading sports equipment suppliers and users to support the development and delivery of an exploitation plan that will capitalize of the most promising opportunities;
- dedicates resources to delivering the exploitation plan;
- finds a way to continue and develop early successes in the novel use of Additive Manufacturing technology to develop new materials and medical implants.

Strategies and plans for development of the Unit

Grade: Good

Discussion:

This is the weakest area of the self-assessment report because it does not include a clearly articulated research strategy and implementation plan. The Unit leaders had completed a SWOT analysis that was discussed at the evaluation meeting. From these discussions the evaluation team was impressed by the enthusiasm of the staff and by the standard and distinctiveness of the laboratories they have established over the last 10 years and are planning in the near future (wind tunnel). In addition, the Unit leader outlined plans to form an additive manufacturing company that could deliver services to industry and thus creating academic time for other activities. The evaluation team concluded that an effective research strategy could be built around a smaller number of larger projects that capitalize on key specialist areas within the Unit: Additive manufacturing (of surgical materials and sports equipment), Performance Optimization (of sports equipment for non-disabled

and disabled people), and Verification/testing methods and facilities. However, there were concerns that without the focus provided by a clearly defined research strategy, staff enthusiasm coupled with access to high quality facilities would result in increasingly diffused activity which would not be in the long term interests of the Unit, Miun or the individual staff and other researchers themselves. Specific concerns relate to the intellectual coherence of the Unit which is unclear in places, e.g. the academic case for categorising surgical applications of additive manufacturing under sports technology was unconvincing. In addition to their core business, the Unit carries out miscellaneous activities such as work related to violins, which does not fit with its strategic priorities. Staff within the Unit articulated multiple visions for its future research.

From the Evaluation Meeting, it is clear that the staff of the Unit operates effectively as a team, but at times, there was a lack of clarity regarding which professors were leading which activities. This risks dilution of the intellectual rigor needed to underpin research proposals that will allow the Unit to take forward more basic research activities. The profile of the permanent research staff of the Unit is unbalanced with three professors, four assistant professors and no associate professors. As identified in the SWOT, substantial benefits are likely to be gained by making better use of international connections in terms of exchange, both on the level of junior and senior researchers and in order to bring additional complementary skills to support future joint applications at the international level.

The Unit has limited visibility on the web, both independently and through the Miun web site. The SportsTech web site (<http://www.sportstech.se/>) includes broken links and is a mixture of Swedish and English. In the discussions, Sportstech was described as a brand; this is confusing because a Google search without Miun results in hits like organizations called Sportstech in automotive sports and tennis coaching. The long term financial viability of the Unit is dependent on the development of taught courses linked to research.

Recommendations:

Based on the discussions above, we recommend that:

- the Unit develops an intellectually coherent future research strategy (10+ years) and a 5-year delivery plan that takes account of available resources and aspirations/plans of the University as a whole and includes research-driven education programmes;
- the Unit, in collaboration with other departments or universities that would benefit from accessing the Unit's laboratories, explores the establishment of a PhD programme;
- as a matter of urgency given the imminent launch of Horizon 2020, the Unit establishes a coherent web presence that appears high in search engine results, including the one on the Miun web site;

- the University and Unit consider funding at least one Associate Professor post that would be externally advertised.

Recommendations for development

1. Based on the discussion on the topic of quality of research, we recommend that the Unit:
 - targets more publications towards higher impact journals in Sports Technology and wider areas;
 - increases its focus on and volume of activity in theoretical aspects of Sports Technology;
 - increases its collaboration with the Department of Sports Science.
2. Based on the discussion on the topic of productivity, we recommend that:
 - permanent staff members within the Unit prioritize the production of more higher quality publications;
 - the Unit includes in its future research strategy and delivery plans funding for more PhD students and post-doctoral researchers.
3. Based on the discussion on the topic of research environment and in frastructure, we recommend that the Unit identifies more sports equipment applications than the roller ski.
4. Based on the discussion on the topic of networks and collaborations, we recommend that the Unit:
 - determines which partnerships are of strategic importance to its future research strategy and directs effort to consolidating and developing these relationships;
 - further develops its cooperation with the Sports Science activity at Miun.
5. Based on the discussion on the topic of coproduction and external cooperation, we recommend that the Unit:
 - includes in its future research strategy and delivery plans more coproduction of publications with external partners;
 - leverages its excellent external cooperation and unique geographical position to underpin deeper, more fundamental studies and focused research;
 - and University explore ways in which the research on medical implants can be taken forward in light of its research strategy.
6. Based on the discussion on the topic of impact, we recommend that the Unit:
 - conducts an audit of impact opportunities and forms a Commercialisation Advisory Committee, including leading sports equipment suppliers and users to support the development and delivery of an exploitation plan that will capitalize on the most promising opportunities;

- dedicates resource to delivering the exploitation plan;
 - finds a way to continue and develop early successes in the novel use of Additive Manufacturing technology to develop new materials and medical implants.
7. Based on the discussion on the topic of strategies and plans for development of the Unit, we recommend that:
- the Unit develops an intellectually coherent future research strategy (10+ years) and a 5- year delivery plan that takes account of available resources and aspirations/plans of the University as a whole and includes research-driven education programmes;
 - the Unit, in collaboration with other departments or universities that would benefit from accessing the units laboratories, explores the establishment of a PhD programme;
 - as a matter of urgency given the imminent launch of Horizon 2020, the Unit establishes a coherent web presence that appears high in search engine results, including the one on the Miun web site;
 - the University and Unit consider funding at least one Associate Professor post that would be externally advertised.

Other Issues

Gender issues: none of the permanent research staff members are female, but the laboratory technician is female and there are some female PhD students.

UoA 7.6 Engineering Physics Faculty of Science, Technology and Media

Experts: Prof. James Olson, Prof. Angeles Blanco,
Former Research Director Lars Gädda, Prof. Alison McKay,
Prof. Janne Laine, Prof. Bandaru V. Ramarao, Prof. Joachim Rosenthal
and Prof. Kerstin Witte.

General assessment of the UoA

The Unit is a significant University strength that conducts highly innovative research and provides strong societal impact, with opportunities to publish in high quality journals and attract significant industrial support. The staff the evaluation team met through the evaluation process appeared open to respond positively to new opportunities that are arising as a result of the changing industrial and economic landscape within which the University operates. The department has a strong vision that aligns well with the strategic vision of FSCN, which is well-placed to strengthen the cohesion between the chemical engineering and engineering physics units.

Overview

The Engineering Physics unit investigates physics of materials of significance in the Forest Bioproducts Industry in close cooperation with FSCN. The research groups categorized by topic are: Materials Physics, Materials Engineering, Solid Mechanics, Computational physics, Digital Printing Center, and Didactics. The overall assessment is that it is strong academically and well-focused in the key missions of the university. The scientific output is of high quality and serves the industrial collaborators well. The didactics area is impactful with significant international visibility. The atomic physics area was considered insufficient because it lacks critical mass.

Areas of strong research that have potential to grow stronger

Each of the areas contributes to the overall strength of this unit. The Materials Physics research is of high quality both academically and with respect to its industrial impact. The spin-off company producing in-situ TEM probes is a strong example of academic research of high societal impact. Materials Engineering within the Unit is strong in aluminium casting and microgravity. Plans to investigate longer term problems in the industry appear promising and relevant to new industries such as silicon materials processing. The Solid Mechanics group collaborates with other national universities (e.g. KTH, Lulea and NTNU) and companies in pulp and paper-allied industry. As a whole, the Unit has a relatively small number of PhD students which puts teaching pressure on senior researchers. Two senior professors with good productivity and quality lead the research in Computational Physics, which is likely to be of significant importance to FSCN.

SWOT Analysis

a. Strengths:

- The UoA has strong connection to industry, largely through FSCN.
- The quality of the academic output is very high. Several publications are in international academic journals of the highest reputation. PhD graduates have been placed at some of the top universities in the world and have progressed into academic institutions.
- Participation and collaborations with industry resulted in a substantially high external funding.

b. Weaknesses:

- The UoA is weak in its international connections and participation in external networks (both EU and the broader international community).

c. Opportunities:

- The strong cross-disciplinary atmosphere at the University, partly due to the limited size of the campus and the smallness of the groups, could be further utilized in larger projects such as the large areas of functional surfaces that require different competences for success.

d. Threats:

- Some groups within the Unit are below critical mass.

Quality of research

Grade: Excellent

Discussion

There are several examples of excellent research with well-cited publications in high-quality journals presenting research at the frontier in the Unit. The materials physics group has performed strong research in nanotechnology and in materials physics. Some of their publications are in leading academic journals and are very highly cited. The computational physics group has several publications in academic journals of high reputation. Similarly, the materials engineering and solid mechanics groups publish a good proportion of their work in academic journals with a fundamental focus. Overall, the quality of the Unit's research is excellent, primarily based on their publications in top academic physics journals. Since their mission is dual focused, they also provide excellent quality research that is able to attract substantial industrial funding. This indicates that their industrial focus is highly functional and reinforces their leading position in hosting specialized conferences focused on industry. During the evaluation meeting, the team gave a strong explanation of how their industry-focused research leads to the identification of more basic research areas and questions.

Recommendations:

Based on the overall evaluation, we recommend that

- The UoA explores mechanisms for more longer term funding to support fundamental research;
- The UoA increases effort and support to enable successful participation in the EU Framework funding;
- The UoA increases the number of Postdoctoral fellows, either through increased external funding or through re-prioritization of existing resources.

Productivity

Grade: Very good

Discussion:

The Unit has completed six PhD examinations and several of the members of the group have been promoted during the evaluation period. Some groups within the Unit are more widely recognized in the academic community than others that are more industrially focused. Citations of the Unit's research is relatively low, which arises partly because industrial research tends to be less cited than fundamental research, e.g. research on the mechanics of paper is not cited as much as that on semi-conductors. To move to the higher level is necessary to gain international recognition; the Unit's productivity (measured by outputs per researcher) needs to be improved.

Research environment and infrastructure

Grade: Very Good

Discussion:

The Unit has 16 members evenly distributed on the different levels. The research groups are very productive and their collaborations within Miun are sufficiently interdisciplinary to have high impact. The infrastructure is sufficient for the Unit's current research activity; the materials engineering laboratory is excellent and the mechanical testing laboratories support significant industrial research and are very good for this purpose.

Recommendations:

Based on the overall evaluation, we recommend that

- The UoA prioritizes efforts to recruit postdoctoral researchers who can carry different research functions at higher levels than Ph D students.

Networks and collaborations

Grade: Very Good

Discussion:

Although the evaluation report lists a large number of collaborators on publications, the overall strength and breadth of their collaborations are weaker than indicated and engagement with academic partners would benefit from including more international dimensions.

Recommendations:

Based on the overall evaluation, we recommend that

- The UoA widens its international (EU) network and collaborations through increased conference participation, scientific visits, staff and student exchanges, workshop organization, encouragement of students, post-docs to work internationally and the like;

Coproduction and external cooperation

Grade: Very Good

Discussion:

Coproduction in the research is high as is clear from example cases presented and also from the major involvement of each of the research groups with industrial and external collaborators. Some of the research groups focused more primarily on industrial work might use these applications to identify opportunities for more fundamental research.

Impact

Grade: Very Good

Discussion:

As evidenced by the case studies included in the evaluation report and examples shown during the evaluation meeting, the research of the Unit has high impact with high significance to society.

Strategies and plans for development of the Unit

Grade: Very Good

Discussion:

Plans to focus on the KM2 concept in the near future were discussed in the evaluation report and meeting. The evaluation panel is confident that this is a promising area

that could benefit from the work of a number of groups within the Unit. In addition, the evaluators are confident that the Unit, in collaboration with FSCN, is well-placed to contribute to the development of this futuristic concept. The strategy will take advantage of synergies achieved from coupling research from the Unit with pull from the FSCN and STC research centers. This combination of competence and capacity gives the evaluation team that the KM2 strategy is realizable for this Unit. Within the UoA, junior faculty is highly active and there are several examples of very good renewal of faculty. It was noted in the evaluation meeting that staff members feel that increasing administrative loads have a detrimental effect on their ability to carry out high quality research.

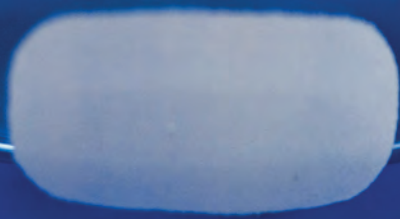
Recommendations:

Based on the overall evaluation, we recommend that

- the UoA evaluates the engineering physics research vision (like KM2) as part of the FSCN bio-material strategy;
- the UoA explores further complementarities between the Unit and the Miun research centres.
- the University supports the personal development of junior researchers into independent researchers through e.g. mentoring and training and also ensuring that they have sufficient time devoted to the development of independent research areas;
- to create time for research, staff members within the UoA explore ways of building more effective teams that include both administration and academic staff.



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4.2.8 Research Field 8: Computer and Information Sciences

UoA 8.1 Sensible Things that Communicate (STC)
Faculty of Science, Technology and Media

Experts: Prof. Bradford G. Nickerson, Prof. Manfred Glesner,
Prof. Chunming Rong, Prof. Manos Tentzeris and Dr. Bernt I. Ericson.

General assessment

On Tuesday, November 12, our research evaluation team (with Manos Tentzeris joining via Skype from Atlanta, Georgia) met with Mattias O’Nils, Fanny Bergman, Kent Bertilsson, Claes Mattsson, Bengt Oelmann, Tingting Zhang and Patrik Österberg. Mattias gave an overview of the STC research, including the bigger picture of the funding and structure of the STC research centre. This overview was interspersed with questions from the evaluation team.

Following the discussion and presentation, we were given tours of labs and facilities we had not seen on Nov. 11.

Following lunch, we met the generalists Harry Fekkers, Christina Johannesson and Rolf Ericsson. We shared our initial findings about the Electronics and Computer Science units, and they shared the reporting process they planned to follow. We then met with the STC team named above to clarify STC funding, processes and future plans.

Grades	Quality	Productivity	Infrastructure	Collaborations	Coproduction	Impact	Renewal
Excellent					X		
Very good	X	X		X		X	
Good			X				X
Insufficient							

Table 1. Summarizes our overall assessment.

The above table and sections below refer to the following scale:

Excellent – Internationally leading quality and visibility.

Very good – Nationally leading and internationally good and recognized.

Good – Nationally good and internationally promising.

Insufficient – The research does not meet basic scientific quality criteria at national level. Research activities should be revised.

Sections 2 to 8 below contain a summary of the assessment of each of the research dimensions. For a detailed analysis of sections 2 to 8, we refer the reader to our assessment reports for Research Field 8, Unit 8.2 Computer Science and Unit 8.3 Electronics.

This report is based on the knowledge we gleaned from site visits on Nov. 11 and 12 as described above, along with two versions of the self-assessment STC - Sensible Things That Communicate. The printed and electronic versions of the self-assessment both have 81 pages. Hans-Erik Nilsson sent (on Nov. 25, 2013) a document with the file name `feedback_review_STC_electronics_computer_science.docx` entitled "Feedback and remarks to the Review Team for Electronics, Computer Science, and STC" that provides additional information and corrects an error that appeared in table 2.2.6 Productivity.

Quality of research

Grade: Very good

As a regional research centre, the quality of research is very good. To achieve internationally recognized research quality requires publishing of papers in higher quality conferences and journals. As Mid Sweden University is a relatively small university on the world stage, it is wise to focus Miun research efforts in areas that have a significant impact on the regional and national economy, especially in light of the focus within Swedish research funding agencies to support research that includes industrial collaboration.

The citation rate as reported by Web of Science is 2.37 citations per article, h-index of 11 on the 204 published articles 2007 to 2013, top cited article cited 60 times. This is for 31 authors (research staff with PhD). This is a good Web of Science quality measure, but the majority of the contributions come from the Electronics group. This is understandable as there were an average of 3.52 FTE senior researchers + postdocs in Computer Science in 2011 and 2012, compared to an average of 12.82 in Electronics.

As comparable groups, we looked for research teams in similar areas working within and owned by a university. We note that VTT Technical Research Centre of Finland is a not-for-profit organization, but is not a University based research centre, having 2,900 employees (Dec. 31, 2013) along with a turnover of 316 M Euro in 2012. SINTEF in Norway is an independent, non-commercial organization with the aim "to become the most renowned contract research institution in Europe". SINTEF had around 2,000 employees and a turnover of approximately 400 M Euro in 2012. SINTEF seems to have a significant cooperation with the National Technical University of Norway (NTNU) in Trondheim, with around 500 people working at both NTNU and SINTEF and extensive joint use of laboratories and equipment.

One very productive university-based research centre we found is the Center for Information Technology Research in the Interest of Society (CITRIS) at the University

of California Berkeley. The 30 CITRIS "leaders" had a reported (by Web of Science) 514 publications in 2007 to 2013, with an average 11.01 citations per published item, h-index of 33 and the top cited article cited 723 times. These figures are world leading, and are partly due to the fact that UC Berkeley is a much larger research organization compared to Mid Sweden University. In addition, CITRIS is composed of 383 researchers from a wide variety of research fields. While it is unlikely that STC can reach this level of quality in the near term, it does point out the level currently being achieved in one world class research centre.

The research quality is affected by the basic education that students entering the research degrees receive. We observed that academic programs in Electronics and Computer Science are somewhat lacking in breadth and depth at the Bachelor's and Master's levels. We learned from Hans-Erik Nilsson that there is a signed agreement between the Royal Institute of Technology (KTH) and Mid Sweden University regarding their collaboration for joint offerings of the *civilingenjör* (Degree of Master of Science in Engineering, 5 year) degree program. This agreement indicates the high quality of the Mid Sweden University Bachelor and Master degree programs in the following two fields:

- (a) MSc Computer Engineering with a specialization in Applied Computer Technology (Miun) (together with other specializations offered at KTH after three years at Miun), and
- (b) Master of Electronic Systems with a specialization in Embedded Sensor Systems (Miun) (again, together with other specializations at KTH (e.g. Electric Power Technology, Robotics and Control) at KTH after three years at Miun).

Hans-Erik has also included the detailed course requirements for these two Master degree programs.

Productivity

Grade: Very good

There is a severe imbalance in the amount of permanent research staff FTEs among the two units comprising the STC. The Electronics unit had 12.9 FTE senior researchers + postdocs in 2011, and 12.75 in 2012, an average of 12.82 per year for the years 2011 to 2012. The Computer Science unit had only 4.14 FTE senior researchers + postdocs in 2011, and 2.89 in 2012, an average of 3.5 senior FTE senior researchers + postdocs over these two years. Despite this, both units have a reasonable productivity. We are surprised that the average of 7.9 peer-reviewed publications per year per FTE researcher in Computer Science is almost double the average of 4.3 per year per FTE researcher in Electronics (revised tables 2.2.6 Productivity). When averaged for STC's 31 research staff with a PhD (17.04 FTE senior researchers + postdocs in 2011, 15.64 in 2012, average of $(17.04 + 15.64)/2 = 16.34$ over these two years), we see

an average of 5.03 peer-reviewed publications per year per FTE researcher in STC.

For Web of Science (WOS) publications, we estimate that Computer Science published 2.57 articles per year per FTE researcher (from 2007 to 2013), compared to the Electronics unit which we estimate published 2.0 articles per year per FTE researcher for the same period. With 204 WOS published articles in 2007 to 2013 for an average FTE senior research staff (with PhD) of 16.34 per year we estimate $204/6 = 34$ articles per year / 16.34 average FTE research staff = 2.08 articles per year, a respectable number. These figures are competitive with other national research groups.

The issuing of 11 patents to researchers working in the STC during the 2007 to 2013 period (almost 2 patents per year) is a good indicator of the high productivity and originality of the research taking place there.

Research environment and infrastructure

Grade: Good

The research environment would benefit greatly from collocating the two research units. Our site visits indicated an urgent need for more space for both units, and an investment in nationally leading and internationally unique research facilities that would attract international participation. The center has to submit large equipment and research infrastructure proposals. These will be easier to fund than individual investigator proposals due to their size.

There is a need for a large shared measurement/characterization space that will be accessible by all the center's faculty and researchers, while being on the Sundsvall campus (not at an external organization). One example might be flexible lab space with a "high bay" for wireless and wired communication characterization designed to house a variety of machinery as well as indoor and outdoor structures. Such a space could be used by multiple groups, and attract national and international collaborators. An example of such a shared characterization facility that attracts hundreds of researchers to the University of Florida annually is the National High Magnetic Field Laboratory.

The proposed increased collaboration between STC and FSCN is a good idea, and will provide increased research capabilities (e.g. in materials science and chemistry) to the STC research environment. The Computer Science research unit lacks coherence, and needs significant resources to establish a critical mass and achieve a reasonable coherence. The centre is clearly male dominated, and would benefit from additional female permanent research staff.

Research networks and collaborations

Grade: Very good

Regional non-academic collaboration is excellent, and there is some national and international academic collaboration. The intensity and amount of national and international collaboration needs to increase significantly to achieve a higher national standing, and larger scale international funding. Achieving this collaboration requires a significant increase in high quality international conference participation (as members of the organizing and program committees) and other scientific venues (e.g. editorships of respected journals).

Coproduction and external non-academic cooperation

Grade: Excellent

Fifty industrial partners is a significant number for 16 FTE permanent research staff. These partners are mainly national and regional, with a few international partners. In our opinion, the research being done in the centre is mostly applied and not fundamental, with a focus on technology transfer. To achieve increased international coproduction requires a stronger focus on fundamental research, with a corresponding increase in quality.

The STC research centre is a very good example of regional industrial coproduction, with fundamental research also being done leading to spin-off companies.

Impact on society

Grade: Very good

The constant stream of doctoral and licentiate degrees is very good, as is the creation of five spin-off companies employing around eight full-time people. This is a result of both the in-house support for intellectual property commercialization and integration with the regional innovation system. Creating 2 to 5 new companies per year requires a much broader base, with more researchers participating in considerably more successful and larger-scale research funding initiatives.

Strategies and plans for development and renewal in the Unit of Assessment

Grade: Good

The current vision statement is weak. Overall, the goals seem to be to continue with the status quo. The vision and goals must be more ambitious, especially in considering international recognition. It is a necessity to bring in fresh ideas by recruiting researchers educated by and participating in top research teams worldwide.

Recommendations for development

Coherence is lacking. It is important to broaden the research base, and to clearly indicate how each group is vital for the centre to achieve its vision. One should feel the ambience of the centre when you walk in, with highly visible success stories everywhere. Better marketing and perhaps a branding exercise would help the centre to achieve this cohesive nature.

World class researchers should be recruited and hired to significantly increase the research capacity, and to give the undergraduate and graduate programs much needed depth and breadth in areas complementary to those now in place. Replacing the researchers recently lost to other institutions in the Computer Science unit should be a high priority.

To recruit top notch researchers to the region requires investment in state-of-the-art research facilities. Nationally leading and internationally unique research facilities need to be established at Mid Sweden University to attract international research collaboration.

Biannual high profile events should be held that highlight the recent research activities of the centre. The current week 42 STC Expo (e.g. on Oct. 15) is very good, but increasing the frequency to twice per year gives more researchers a chance to participate. These could be held in conjunction with international conferences and opening of new research facilities.

As an example of how to increase the profile of STC, Georgia Institute of Technology (Georgia Tech) has a corporate liaison office that collects information/keywords/review papers from all research groups and links interested companies with the appropriate Georgia Tech teams. In addition, Georgia Tech has two (public relations) people in charge of press releases for major achievements. Last, but not least, participation in conference technical program committees and in editorial boards has further enhanced the ATHENA (Agile Technologies for High-performance Electromagnetic Novel Applications) group's visibility. ATHENA also has an open house event every 6 months where government and industrial partners are invited for a first-hand look at prototypes, test beds and facilities.

The STC research centre should initiate collaboration with other similar centers all over the world to establish connections and possible collaborative research. This depends heavily on the people working at the STC, the research contacts they have and can establish, and the resources they have available or can obtain for international travel and collaboration.

The centre should consider increasing the number of postdoctoral fellows who can be very productive, and should be part of the temporary research personnel count.

Other issues

Please prepare and review the self-assessments carefully. We found several significant omissions and inconsistencies. Using one widely accepted publication quality and quantity indicator that can be compared to other universities would increase the quality of the reviewer's assessment reports. Research units should be given the exact template and scoring system to be used by the evaluators before preparing their self-assessments.

A systematic and well-understood process for all permanent research that clearly shows how one is evaluated for promotion is needed.

Mid Sweden University should suggest to the Swedish research funding agencies that it is valuable, and in everyone's best interest, that all research reviewers be told in advance that their (anonymized) evaluation comments will be made available to all research applicants. This is the process in Canada for all Federal granting councils, and it is valuable for researchers to receive reviewer's feedback and comments, especially if the application is not funded.

At the moment, Karlsruhe Institute of Technology and other German TU9 universities do not charge tuition to non-EU students. The lack of breadth and depth in Master and Bachelor degree programs at STC, as well as the difference in cost compared to other European universities are both factors in attracting high quality international students to study at Miun.

Experts: Prof. Bradford G. Nickerson, Prof. Manfred Glesner,
 Prof. Chunming Rong, Prof. Manos Tentzeris and Dr. Bernt I. Ericson.

General assessment

During the afternoon of Monday, November 11, our research evaluation team (with Manos Tentzeris joining via Skype from Atlanta, Georgia) met with Tingting Zhang, Mårten Sjöström, Roger Olsson, Patrik Österberg, Youzhi Xu and Ulf Jennehag. Tingting gave a very brief overview of their research, with the help of her colleagues. This overview was interspersed with questions from the evaluation team, and followed up by more formal questions from the evaluation team. Following the discussion and presentation, the research team was shown several demonstrations in the Realistic 3D lab.

Grades	Quality	Productivity	Infrastructure	Collaborations	Coproduction	Impact	Renewal
Excellent							
Very good		X			X	X	
Good	X		X	X			
Insufficient							X

Table 1. Summarizes our overall assessment.

The above table and sections below refer to the following scale:

Excellent – Internationally leading quality and visibility.

Very good – Nationally leading and internationally good and recognized.

Good – Nationally good and internationally promising.

Insufficient – The research does not meet basic scientific quality criteria at national level. Research activities should be revised.

This report is based on the knowledge we gleaned from site visits on Nov. 11 and 12, along with two versions of the self-assessment Computer science and technology. The printed and electronic versions both have 57 pages. Hans-Erik Nilsson provided (on Nov. 25, 2013) a document with the file name `feedback_review_STC_electronics_computer_science.docx` entitled "Feedback and remarks to the Review Team for Electronics, Computer Science, and STC" that provides additional information and corrects an error that appeared in table 2.2.6 Productivity.

Quality of research

Grade: Good

We compared the research quality of the Computer Science unit (14 research staff with PhD) with other Swedish groups in related areas. The results are shown in

Group	Number in group	Number of published items	Average citations per item	h-index for these items	Number of citations for top cited item
MIUN Computer Science	14	54	0.94	4	13
Karlstad Computer Science	26	73	1.37	4	45
KTH CSC, High Performance Computing and Visualization (HPCViz)	17	42	3.67	6	27
KTH CSC, Computer Vision and Active Perception Lab (CVAP)	22	177	5.15	17	42
KTH CSC, Computational Biology (CB)	30	150	9.35	20	138
KTH CSC, Theoretical Computer Science (TCS)	26	137	8.45	18	78

Table 2.

Karlstad University Computer Science has 26 authors, nearly double the size of the Miun Computer Science group. Karlstad Computer Science average citations per article, number of publications and h-index are all comparable for the given resources. The KTH Computer Science and Communication (CSC) High Performance Computing and Visualization (HPCViz) group has 17 researchers, a comparable size to Miun Computer Science, with fewer publications but a more than three times higher average citations per item, which is significant. The KTH CSC Computer Vision and Active Perception Lab (CVAP) has 22 researchers with a more than five times higher average citation per item. As the average citations per article for Miun Computer Science is 0.94, this indicates that Miun CS articles are being published in less cited journals and conferences, or that the articles are catching less attention.

The top 4 cited articles (of the 54 total) are in *IEEE Transactions on Broadcasting* (556, 6.26, 24), *European Journal Of Operational Research* (4630, 8.14, 57), *International Journal Of Approximate Reasoning* (702, 6.75, 31), And *The Acm International Symposium On Performance Evaluation Of Wireless Ad-Hoc, Sensor, And Ubiquitous Networks* (62, 1.39, 5) where (n1, n2, n3) represent (number of published items recorded by Web of Science in this journal or conference during the years 2007 to 2013, average citations per item for these items, and h-index for these items), respectively. The first three of these publication venues have very good average citation rates, and the fourth

one has a respectable rate. While the 14 individuals in the Computer Science unit are actively publishing, they need to target higher quality journals and conferences.

Leading international research units in computer science and technology include the MIT Media Lab, the Center for Information Technology Research in the Interest of Society (CITRIS, UC Berkeley), and the Pervasive Systems (PS) group at the University of Twente.

Although we have rated quality here as overall good, we note that publishing in less recognized journals and conferences hampers international recognition. The issuing of five patents (Table B2.3.1) during the period 2007 to 2012 indicates a high degree of originality.

Note that most of the researchers in Computer Science and Technology at Mid Sweden University also teach, so this limits the time available for their research. In fact, as noted below, Computer Science had only 4.14 FTE senior researchers + postdocs in 2011, and 2.89 in 2012, an average of 3.5 senior FTE senior researchers + postdocs over these two years. This indicates that the 14 researchers in Computer Science are, on average, doing a significant amount of teaching and other activities in addition to their research.

Productivity

Grade: Very good

According to the feedback_review_STC_electronics_computer_science.docx document "Feedback and remarks to the Review Team for Electronics, Computer Science, and STC" from Hans-Erik Nilsson, Computer Science had 4.14 FTE senior researchers + postdocs in 2011, and 2.89 in 2012. They supervised 11 PhD students in 2011 and 2012, respectively, an average of $11/4.14 = 2.7$ and $11/2.89 = 3.8$ per FTE senior researcher in 2011 and 2012, respectively. This is an above average number.

A total of 8 PhD students graduated over the six years 2007 to 2012 (table B2.1.1, p42 of self-assessment). This is a fairly low number, but one must also consider the 8 licentiate degrees awarded during the same period. If one counts the licentiate degrees as 1/2 of a PhD degree, this amounts to a total of 12 equivalent PhD degrees awarded during the period 2007 to 2012. This averages out to 2 equivalent PhD degrees awarded per year, which is a reasonable number considering the small number of FTE senior researchers available.

In the revised table 2.2.6 Productivity (provided by Hans-Erik Nilsson), we found an average of 7.9 publications per year per senior FTE (professors; full, associate and assistant, and postdocs) for the years 2011 and 2012. This is a significant number of publications per year per senior FTE. This high productivity is also reflected in the Web of Science reports; i.e. 54 published articles in 2007 to 2013 for an average FTE senior research staff (with PhD) of $(4.14+2.89)/2 = 3.5$ per year. So, $54/6 = 9$ articles per year / 3.5 average FTE research staff = 2.57 articles per year, an above average number. This last calculation assumes that the average FTE senior research staff

(with PhD) is also (on average) 3.5 during the years 2007 to 2010, inclusive.

We note that one docent and one professor were promoted in 2008. This is a reasonable number given the rather small number of FTE research staff in the Computer Science unit.

Research environment and infrastructure

Grade: Good

The leadership of the Computer Science team seems to be satisfactory, but needs to be more aggressive in pursuing larger research grants. The presentation made to the review team on the afternoon of Monday, Nov. 11 was not well-prepared. The visit to the Realistic 3D lab was very well done, with posters and live demonstrations, but we saw only one research facility in the Computer Science unit.

Despite asking three times, we did not see any research infrastructure for the Sensor Network & Security and Sensor Based Services groups. It was mentioned that the sensor network research infrastructure used by PhD students was located within the companies they cooperated with, for instance the research lab of ABB in Västerås. This is convenient for students actually located at the cooperating company, but inconvenient for students in Sundsvall. From what we saw, student access to both sensor network and sensor based services research facilities are limited, and needs improvement. At the University of New Brunswick, for instance, there is a 28 m² lab for wireless sensor network research that is valuable for researchers to build prototype systems, and to learn how to build and integrate wireless sensor networks with a variety of sensors and software platforms.

The Computer Science FTE senior research staff lacks critical mass. A significant increase (at least double, preferably triple) the current 2.89 FTE senior research staff is required before the computer science team can compete effectively at national and international levels.

External funding is significant. Moving from 3M SEK in 2007 to 7M SEK external funding in 2012 is a big increase. Broader participation in EU funded projects would be beneficial.

Research networks and collaborations

Grade: Good

There is good cooperation with Acreo ICT, ABB Corporate Research, StoraEnso, Shortlink, Motorola Linköping, all non-academic organizations. We could not find any national academic collaboration, unless the cooperation with Ericsson Research KTH is included.

The joint paper with Beijing Jiatong University authors is a good indication of international collaboration. We see that the 2013 journal paper "CCA-Embedded TDMA enabling acyclic traffic in industrial wireless sensor networks" published in

Ad Hoc Networks has two co-authors from Beijing Jiatong University. The SCImago Journal & Country Rank gives the h-index (for the last 3 years) of this journal as 43, which compares to the IEEE Journal on Selected Areas in Communications with h-index 151 and Proceedings - IEEE INFOCOM with h-index of 118. Ad Hoc Networks is ranked in the top 17% of ranked computer science journals and conferences at <http://www.scimagojr.com/journalrank.php>, which is respectable. Web of Science indicates that Ad Hoc Networks has 803 publications in 2007 to 2013, with an average citation per item of 4.30 and an h-index of 21 indicated a high quality journal.

The collaboration with the University of Valencia PhD student that resulted in three refereed papers is also a good indicator of international academic cooperation. The cooperation with two IIS researchers in the Fraunhofer Institute for Integrated Circuits (IIS) in Erlangen indicates good international cooperation with a world class European research center. The three patents resulting from this cooperation indicate that the research was of high quality.

Coproduction and external non-academic cooperation

Grade: Very good

There is cooperation with Acreo ICT, ABB Corporate Research, StoraEnso, Shortlink, Ericsson Research and Motorola Linköping, which indicates a very high quality of national collaboration. These partners mentioned above are directly contributing to joint research publications and patents. Also, the adjunct professors from ABB Corporate Research and from Acreo ICT are a strong indicator of meaningful national collaboration.

The patent and ten joint papers on wireless sensor networks with ABB Corporate Research in Västerås is a strong indicator of solid cooperation with non-academic partners. Making the ABB research lab facilities available for PhD student use is also a very valuable contribution. This partnership made available a field experiment at StoraEnso that collected a large amount of data in a large scale industrial setting. Such data is valuable for accurate modeling of harsh radio wireless communications.

The fact that such a small group has attracted 14 industrial partners is significant. The interaction with Acreo seems to be well integrated with the Computer Science research team. An employee of Acreo in Stockholm is currently a PhD student at Miun, and Computer Science has one adjunct professor employed by Acreo.

The acquisition of the depth map upscaling invention and filing of a patent by Ericsson AB is a strong indicator of the high value of the research. A similar comment applies to the patent WO/2012/013473 filed and awarded to ABB Research.

Impact on society

Grade: Very good

The academic impact of the research is good, but not at the level of some of the other comparable groups in computer science in Sweden. Karlstad U. has a computer science group with an average citation rate of 1.37 citations per article published in 2007 to 2013, but Miun computer science has an average citation rate of 0.94 for the same period. KTH computer science groups have a much higher average citation rate.

Impacts to society include the 8 doctoral and 8 Licentiate degrees awarded to students in the last 6 years. In addition, the awarding of 105 Master degrees in six years, an average of 17.5 per year, is a significant contribution to society. The patents awarded to ABB Research and to Ericsson AB could have a significant impact in the future if they give rise to new products or services in Sweden that result in additional jobs.

The impact of the energy aware wireless sensor network could be significant for ABB. A peak throughput improvement for WirelessHART data packets of 82 % could increase the number of network sensors and actuators used in an industrial control environment by a similar amount. This can improve the efficiency and reliability of industrial control systems sold by ABB. ABB obtained a patent to protect these ideas, so they consider the ideas useful.

The invention of an improved time-of-flight data capture and upscaling algorithm to accompany acquired 2D video data is promising for 3D video capture and 3D data compression. A patent application by Ericsson AB on this invention indicates that a non-academic partner values these ideas.

Strategies and plans for development and renewal in the Unit of Assessment

Grade: Insufficient

The strategy to be at the forefront of Swedish research in wireless sensor network systems and services is laudable, but seems unlikely to be achievable for such a small unit. Achieving the stated goal of high throughput of doctoral degree recipients has already been achieved considering that only 2.89 FTEs of qualified supervisors are available. In 2012, this results in an average of 3.8 PhD students supervised per FTE of senior research staff. Only 8 PhD students have graduated, however, in the six years from 2007 to 2012. In our opinion, the computer science unit does not have the critical mass necessary to be a strong competitor internationally, or even nationally. Reasonable results are being achieved in the realistic 3D and sensor network and security groups. The plan to build for profit companies for specific domains on top of the open source SensibleThings platform is also good, but needs to be fleshed out more. A much more aggressive strategy to recruit full time senior research staff is needed. Can full-time "research chairs" partly sponsored by industry, be

established? Much more interaction with top computer science researchers and teams in Sweden should be planned.

The vision statement needs to be stronger, better integrated with the STC vision and with a broader focus on strong national and international cooperation to obtain larger research funding with EU and other international partners. We suggest something like “Miun computer science is a world recognized leader in sensor networks and services research. Products and services based on Miun computer science inventions are used by the majority of Swedish companies, and a significant portion of international companies.”

Mentorship of junior faculty members is via cosupervision of PhD students with senior faculty members. As promotion seems to be via the recognized capability of junior faculty to supervise PhD students, this seems to be adequate.

We reviewed the progress of the five junior faculty members in Computer Science (see Table 3 below), along with comparable junior faculty members at KTH. The fact that Ulf Jennehag is named as co-inventor on three awarded patents is very promising. The highest number of publications is from Mårten Sjöström, but the articles he has coauthored are little cited. These junior faculty members need to publish in higher quality venues. The fact that Mårten Sjöström has participated in one patent pending application (2013) is also promising. The publication record of these five Computer Science junior faculty members is very good.

Researcher	WOS no. of published items	WOS avg. citations per item	WOS h-index for these items	GS citations	GS h-index	GS no. of citations for top cited item
Ulf Jennehag (Ass. Prof.)	4	4.0	2	89	4	33
Stefan Petterson (Ass. Prof.)	6	3.5	2	NA	NA	NA
Patrik Österberg (Ass. Prof.)	2	1.0	1	NA	NA	NA
Rahim Rahmani (Ass. Prof.)	4	0.25	1	NA	NA	NA
Mårten Sjöström (Assoc. Prof.)	23	0.17	1	NA	NA	NA
Christopher Edward Peters (Assoc. Prof. KTH HPC and Visualization group, from Coventry University originally)	NA	NA	NA	546	14	70
Mario Romero (Assoc. Prof. KTH, HPC and Visualization group, from Georgia Tech originally)	NA	NA	NA	143	7	25
Carl Henrik Ek (Ass. Prof. KTH Computer Vision and Active Perception Lab CVAP)	7	0.14	1	240	8	75
John Folkesson (Ass. Prof. KTH Computer Vision and Active Perception Lab CVAP)	5	3.60	2	443	12	148
Mårten Björkman (Assoc. Prof. KTH Computer Vision and Active Perception Lab CVAP)	8	3.50	3	410	10	88

Table 3. Web of Science (WOS) citation reports (years 2007 to 2013) and Google Scholar (GS) reports (years 2008 to 2013) for junior Computer Science researchers. These reports were made on Dec. 19, 2013. NA means not available.

There seems to be little classical computer science research going on in this unit, although some of the applied research we saw relies on classical computer science and image processing theory. It is a weakness that this unit has less breadth than other world-class computer science research units.

Recommendations for development

Computer Science and Technology is currently doing research in two distinct areas that seem to be unrelated; i.e. realistic 3D and sensor networks and services. The lack of critical mass means that there is less variety of research occurring, which limits the opportunity for cooperation and research supervision. We recommend that a significant increase in research capacity be undertaken to hire promising researchers in complementary computer science areas such as software engineering, distributed computing, data intensive computing, databases, decision analysis, artificial intelligence, data mining and machine learning. To achieve the necessary number of PhD students requires more resources.

The lack of lab facilities for the sensor networks and services groups should be addressed. A new vision and strategy to achieve the new vision must be developed that clearly indicates aspirations to achieve international recognition. Processes should be established to encourage spin-off companies to be developed by students and staff. Better integration with the Electronics research groups is a necessity for reaching our suggested vision.

Other issues

Having only one female researcher among the permanent staff has obvious potential to be improved. Activities such as summer camps for female students, hiring additional female research staff, and female computer science students and staff visiting schools (both primary and high school) with CS Unplugged (see <http://csunplugged.org/> , especially the video) activities should be considered.

A good example of more females than males in university computer science programs is given in the reference below.

Reference

Mazliza Othman and Rodziah Latih, "Women in computer science: no shortage here!", *Communications of the ACM*, vol. 49, no.3, 2006, pp.111-114.

UoA 8.3 Electronics

Faculty of Science, Technology and Media

Experts: Prof. Bradford G. Nickerson, Prof. Manfred Glesner,
Prof. Chunming Rong, Prof. Manos Tentzeris and Dr. Bernt I. Ericson.

General assessment

On the morning of Monday, November 11, our research evaluation team (with Manos Tentzeris joining via Skype from Atlanta, Georgia) met with Kent Bertilsson, Claes Mattsson, Sebastian Bader, David Krapohl, Johan Sidén, Benny Thörnberg and Bengt Oelmann. Kent gave an overview of their research, with the help of his colleagues.

This overview was interspersed with questions from the evaluation team.

Following the discussion and presentation, four members of the research team were shown a demonstration in the X-ray lab along with four other demonstrations

Grades	Quality	Productivity	Infrastructure	Collaborations	Coproduction	Impact	Renewal
Excellent						X	
Very good	X	X	X	X	X		
Good							X
Insufficient							

Table 1. Summarizes our overall assessment.

The above table and sections below refer to the following scale:

Excellent – Internationally leading quality and visibility.

Very good – Nationally leading and internationally good and recognized.

Good – Nationally good and internationally promising.

Insufficient – The research does not meet basic scientific quality criteria at national level.

Research activities should be revised. This report is based on the knowledge we gleaned from site visits on Nov. 11 and 12, along with two versions of the self-assessment Electronics. The printed version has 73 pages and the electronic one (shared on Oct. 13) has 71 pages. Hans-Erik Nilsson provided (on Nov. 25, 2013) a document with the file name `feedback_review_STC_electronics_computer_science.docx` entitled "Feedback and remarks to the Review Team for Electronics, Computer Science, and STC" that provides additional information and corrects an error that appeared in table 2.2.6 Productivity.

Quality of research

Grade: Very good

We compared the research quality of the Electronics unit (20 research staff with PhD) with other Swedish groups in related areas. The results are shown in Table 2.

Group	Number in group	Number of published items	Average citations per item	h-index for these items	Number of citations for top cited item
MIUN Electronics	20	154	2.94	11	60
Karlstad Elektroteknik	8	27	2.19	5	14
KTH, EE, Automatic Control	45	384	4.29	19	60
KTH, EE, Wireless Networks, Communication Theory	6	213	2.54	11	54
KTH, EE, Electrical Energy Conversion, High Performance electrical Drives	6	30	1.70	5	13
KTH, EE, Industrial Information and Control Systems	11	101	1.27	6	27
KTH, EE, Micro and Nano Systems	10	203	7.77	20	142
KTH, EE, Signal Processing	12	227	5.22	18	75

Table 2. Web of Science Citation Reports from Electronics research groups, years 2007 to 2013. These reports were made during the period Nov. 23 to Nov. 29, 2013

The Karlstad U. Elektroteknik group is less than half the size, and has a lower average citations per item. The Automatic Control group within Electrical Engineering at KTH has a significantly higher average citations per item, but their group is more than twice as big as the Electronics group at MIUN. MIUN Electronics is clearly getting more attention than the smaller KTH Electrical Energy Conversion, High Performance Electrical Drives group. The MIUN Electronics group is clearly better than the KTH Industrial Information and Control Systems group with more than double the average citations per item. This is in contrast to the KTH EE Micro and Nano Systems group, who, with half the researchers has more than double the average citations per item.

The top 4 cited articles the MIUN Electronics researchers are in *Optics Express* (9260, 3.77, 38), *Optics Letters* (4943, 3.60, 30), *Nuclear Instruments & Methods In Physics Research Section A-Accelerators Spectrometers Detectors And Associated Equipment* (3991, 1.66, 21), And *The Iet Microwaves Antennas & Propagation* (633, 1.11, 8) where (n1, n2, n3) represent (number of published items recorded by Web of Science in this journal or conference during the years 2011 to 2013, average citations per item for these items, and h-index for these items), respectively. These four publication venues

have very good average citation rates and h-index considering that this is only for the last three years.

It seems that the Electronics unit performs excellent applied research using off-the-shelf electronics. Some of the sensors this unit developed are state-of-the-art. Leading international research units in electronics include IMEC (Leuven, Belgium, specializing in nano-electronics), the University of Texas Microelectronics Research Center and the Fraunhofer Institute for Microelectronic Circuits and Systems in Duisburg, Germany.

The issuing of six patents during the period 2009 to 2012 indicates a high degree of originality. These patents have led to the spin-off companies mentioned in the impact on society section.

A very good quality of research is being performed by the power electronics, printed paper sensors, radiation sensors and smart cameras groups.

Note that most of the senior researchers in Electronics at Mid Sweden University also teach, so this limits the time available for their research.

Productivity

Grade: Very good

According to the feedback_review_STC_electronics_computer_science.docx document Feedback and remarks to the Review Team for Electronics, Computer Science, and STC from Hans-Erik Nilsson, Electronics had 12.9 FTE senior researchers + postdocs in 2011, and 12.75 in 2012. They supervised 24 and 27 PhD students in 2011 and 2012, respectively, an average of $24/12.9 = 1.86$ and $27/12.75 = 2.12$ per FTE senior researcher in 2011 and 2012, respectively. This is an above average number. The Electronics group graduated 14 PhD students over 6 years (2007-2012). This is a respectable number. We were told another 12 PhD students graduated in 2013. If so, this gives a seven year average of $26/7 = 3.7$ per year, an above average number given the resources.

We also note that 25 licentiate degrees were awarded in six years, which is about the same number as PhD degrees. This is a very good number of licentiate degrees (around four per year); especially since we were told licentiate degree recipients will likely be hired by industry.

MIUN Electronics has an average FTE senior research staff (with PhD) of $(12.9+12.75)/2 = 12.82$ per year for the years 2011 to 2012. With 154 reported (by Web of Science) articles published over six years, we have $154/6 = 25.67$ articles per year / 12.82 average FTE research staff = 2.0 articles per year, an average number.

The self-assessment indicates there was promotion of 2 docents (one in 2009, one in 2011) and 1 professor in 2009. This is a reasonable number given the rather small number of FTE research staff in this group.

Research environment and infrastructure

Grade: Very good

We saw the X-ray, photonics and printed electronics and sensors labs, along with the clean room, Master student study space and high performance computational facility. These were cramped, but looked functional and well-used. We recommend that more space is allocated for these activities. Access to the SCA (Swedish Cellulose Association) electron microscope located next door in the SCA facilities is a distinct advantage for the research taking place in the Electronics unit. The collaboration with CERN in Switzerland is a strong indicator of international research facilities being made available to Mid Sweden University researchers, and is valuable for MIUN Electronics researchers in the radiation sensor systems group. The demos we saw (X-ray detection of soft tissues and gamma + alpha real-time areal detection with MEDIPEX detectors, wireless camera real-time image capture and wireless transmission with built-in image processing by FPGA, printed on paper moisture sensor, high frequency 45 W switched mode AC-DC power supply, differential air pressure detection of torque, low voltage high current induction motor) indicate access to high quality research infrastructure in power electronics, printed sensor systems and visual sensor systems.

While there is no female permanent research staff, there are an increasing number of female PhD students. The demographic mix of graduate students we encountered was international, which is good. The six groups we met with seemed to be aware of each other's research which can lead to opportunities for interdisciplinary research. The electronics team we met with welcomed the idea of having the Computer Science unit collocated with them; this could lead to more multidisciplinary research. They were also keen to work on interesting research problems in the FSCN research centre, which can lead to further collaborations.

The leadership of the Electronics team seems to be very good, but needs to be a bit more aggressive in pursuing larger research grants. The presentation made to the review team on the morning of Monday, Nov. 11 was well-prepared. The visit to the X-ray lab was very well-explained and interesting, as were the six or so demos presented in the hallway. The leaders of the Electronics team were kind enough to show us additional labs (e.g. printed sensors, fibre optics, clean room, outdoor sensor nodes) on Nov. 12.

The Electronics FTE senior research staff of 12.75 in 2012 is a reasonable number. The fact that all staff members are male can be somewhat daunting for prospective new female senior research staff members (those with a PhD). Engaging at least some postdoctoral fellows (who are entering the peak of their research productivity) could help increase research quantity, and probably quality if the right postdocs are chosen. Having some guest researchers from other countries might also increase the amount of international collaboration.

We recommend that the center provide more space for shared characterization

space that can be used by multiple groups, including national and international collaborators. This could lead to more favorable attraction for recruitment and research collaborations to come to Mid Sweden University.

An example of that outreach that was mentioned was the International Summer University held every June attracts 20 to 30 interdisciplinary students. Maintaining or even increasing participation in this activity is a very good idea to make prospective graduate students aware of Electronics research at Mid Sweden University.

External funding is significant. Moving from 11M SEK in 2007 to 17.8M SEK, external funding in 2012 is noteworthy. Broader participation in EU funded projects would be beneficial.

Research networks and collaborations

Grade: Very good

There seems to be good academic cooperation of the radiation sensor systems group with CERN, and the fact that two PhD students have graduated with working experience of the Medipix systems is good. There is clear evidence of strong international collaboration with 22 published papers in Medipix related areas in six years, and some of these co-authored with scientists in Prague, CERN Switzerland, Helsinki University and the University of Glasgow, UK. There appears to be a high degree of integration of Medipix researchers in CERN with the radiation sensors group at MIUN. The printed sensor systems group has demonstrated clear national collaboration with Linköping University in their successful joint research application.

Coproduction and external non-academic cooperation

Grade: Very good

SCA contributes to the availability of their electron microscope, located in an adjacent building, to the Electronics unit. This contribution is significant. The large amount of in-kind contribution (e.g. average of around 11 M SEK per year over the evaluation period) indicates a very significant non-academic collaboration.

As Figure 8 (p.25 of self-assessment) shows, there were around 27 SME and 12 big enterprise industrial partners in 2012. This is a very high number for the size of the Electronics research group. In particular, the fact that some companies are spinoffs from the research within the Electronics group at MIUN is very significant.

Examples of some of the non-academic partners are

- (a) RTI Electronics, a strong US company in passive electronic components (p.33, Innov.2),
- (b) SiTek Electro Optics AB, a world leader in position sensing detectors, near Gothenburg (p.34, Innov.3),
- (c) NKT Photonics, a world leader in supply of micro structure fibres, fibre lasers, fibre components and subsystems, Denmark (p.35, Innov.4),
- (d) ST Microelectronics (very large company (48,000 employees, 11,500 in

- R&D), world leader in semiconductor manufacturing (p.38, Innov.7),
- (e) Klimator AB (small company, Gothenburg (p.40, Innov.10, ice detector),
 - (f) Combitech AB (mid-size consulting company (~1,300 people), Linköping, (p.40, Innov.10, ice detector),
 - (g) Andritz Iggesund Tools and PulpEye AB, two smaller Swedish companies specializing in equipment for the pulp and paper industry (p.41, Innov.11, scan chip).

Impact on society

Grade: Excellent

The academic impact of the research is very good, and at or near the level of other comparable electronics research groups in Sweden. Citation rate as reported by Web of Science is 2.94 citations per article, h-index of 11 on the 154 published articles 2007 to 2013, top cited article cited 60 times. Collaboration with international research groups is also significant.

The five spin-off companies coming from this unit are a highly significant contribution to society. These companies currently employ around 8 people in the local economy. Start-up companies include: Mid Dec Scandinavia AB (radon sensor), Raybium AB (high power laser fibre optics), Sensible Solutions Sweden AB (passive RFID sensors, thermally activated printed batteries), SEPS Technologies AB (high frequency power converters), and OnTop Measurement AB (online paper topography measurement). Two upcoming spin-off companies mentioned on the STC web site include RPM-sensor and Sense-A-Vision AB. This is a good sign that spin-off companies from the Electronics unit will continue to have an impact on society by directly employing highly educated people.

The original printed wireless sensor label research has generated a significant amount of interest worldwide. Their invention has the potential to decrease the cost of low or no active power sensors by a factor of 10. The local company Sensible Solutions AB resulted in direct economic activity through their international sales. The X-ray imaging case study provides evidence of much faster radon reading efficiency (e.g. 10 minutes vs. a few weeks for the current technique). The improved calibration of CT equipment arising from the point dose detector research can improve the accuracy of X-ray equipment such as mammography machines.

The two doctoral degrees awarded to students employed externally is an indication the high regard for this unit by society. An average of 3 collaborative doctoral students per year supported by industry or the public sector illustrates a strong interaction between this unit and society. An average of around 45 collaborative organizations per year over the years 2010 to 2012 is a very significant impact.

Strategies and plans for development and renewal in the Unit of Assessment

Grade: Good

The self-assessment lacks an independent vision and overall goals for the Electronics unit separate from STC.

Industrial support is very strong, as is the vision to be the leading research and development engine for the Mid Sweden region. The vision needs to be stronger, better integrated with the STC vision and with a broader focus on strong national and international cooperation to obtain larger research funding with EU and other international partners.

The strategy to build a nationally competitive and regionally excellent Electronics unit focused on industrial applications has been a success. There is a lack of ambition to become an internationally recognized Electronics research unit. This needs to be addressed. There seems to be little classical electronics research going on in this unit, although all of the applied research we saw relies on classical electronic theory. It is a weakness that this unit has less breadth than other world class Electronics research units.

We reviewed the progress of the six junior faculty members in Electronics (see Table 3 below), along with comparable junior faculty members at KTH. The fact that Johan Sidén (Ass. Prof.) is named as co-inventor on a patent awarded in 2009 is very promising. Kent Bertilsson (Assoc. Prof.) is listed as inventor on 5 patents issued in 2009 to 2012, which is impressive, particularly as he is the sole inventor listed on patent US 7978041B2 which seems to have wide-ranging claims. All of the above statistics are for the years 2007 to 2013, inclusive. The highest number of publications is from Göran Thungström, and the articles he has coauthored are well-cited. The fact that Johan Sidén has an average citation rate of 3.73 is noteworthy. The publication record of these six junior faculty members is very good.

Researcher	Number of published items	Average citations per item	h-index for these items
Börje Norlin (Ass. Prof.)	26	1.42	4
Göran Thungström (Assoc. Prof.)	38	1.97	5
Johan Sidén (Ass. Prof.)	19	3.73	4
Kent Bertilsson (Assoc. Prof.)	15	2.73	4
Benny Thörnberg (Ass. Prof.)	6	0.33	1
Jan Thim (Ass. Prof.)	8	0.88	2
Juliette Soulard (Assoc. Prof. KTH Electrical Energy Conversion group)	10	1.3	1
Joakim Lilliesköld (Ass. Prof. KTH Industrial Information and Control Systems group)	7	0	0
Robert Lagerström (Ass. Prof. KTH Industrial Information and Control Systems group)	22	2.09	3
Niclas Roxhed (Ass. Prof. KTH Micro and Nano Systems group)	37	5.68	7
Joachim Oberhammer (Assoc. Prof. KTH Micro and Nano Systems group)	43	2.77	6

Table 3. Web of Science Citation Reports for junior Electronics researchers, years 2007 to 2013. These reports were made on Jan. 2, 2014.

Recommendations for development

Having a higher ambition will ensure the local and regional companies have access to internationally competitive solutions to their needs. The chance of successful spin-off companies also improves with successfully executed plans to achieve such ambitions. The plan to collaborate more with FSCN is a good one, particularly in the area of materials science and engineering physics. Hiring a mechatronics professor may not be wise due to the commitment required. Participation in larger EU grant proposals requires additional effort to partner with leading research groups in Sweden and other EU countries. We recommend additional collaboration or hiring of researchers in the materials science area to complement the current research activities. We strongly recommend that this unit increase and dedicate more resources to fundamental research that can contribute to a wide variety of applied research in the physical sensors and communication research areas.

Other issues

A zero percent female presence among the permanent staff has obvious potential to be improved. This will only happen with direct action targeting this issue. A few examples of such actions are given in the assessment report for research field 8.2 Computer Science and Technology.



4.2.9 Research Field 9: Biology and Environmental Sciences

UoA 9.1 Biology

Faculty of Science, Technology and Media

Experts: Prof. Pieter Glasbergen, Prof. André Faaij and Prof. Anna-Liisa Ylisirniö.

General assessment

The UoA has met considerable reduction of staff during 2012, and the evaluation of the unit therefore focuses on the remaining group, which represents terrestrial ecology mainly studying forest dynamics, biodiversity and conservation. The remaining staff has a strong reputation in their study field, showing excellent publication records and large national and international networks. Despite of the small size, the UoA has succeeded in building effective cooperation both in the academic world and with practical operators and institutions in society, being among the most respected units in its field in the boreal perspective. The present small size and temporary employment of many staff members poses a threat to the future research capacity and recruitment of students of the unit, and attention should be paid to ensure the position of personnel.

The work has a clear focus and scientific quality is high. At the same time, it would be good to widen the perspective of the work scope. For a sustainable future, it is important to strengthen the group either by improving collaboration or including relevant researchers from other Miun units into the group. Miun should facilitate such a strategy.

Quality of research

Grade: Very good/Excellent

The research activities of the UoA concentrate in forest biodiversity and sustainable management of boreal forests. This is an especially important subject in all circumpolar countries with intensive utilization of forest resources, including North America and Russia, and it links also to global questions of biodiversity decline in forest ecosystems and increasing valuation of forests in maintaining ecosystem services, e.g. global carbon balance. The present research topics focusing on dead wood, forest history and dynamics, fungal and restoration ecology, and conservation strategy and policy of forests are interrelated and form a logical research entity, where the UoA has strong expertise and a long research tradition. This has resulted in a large number of high-quality publications in peer-reviewed journals and two high-quality books in the series of an international publisher. Both the Journal field normalized citation impact and Average field normalized citation rates are above the average, and of the selected 30 papers, 7 are among the top 25 percent and 4

among the top 10 percent most cited in the field. Related to its resources, the unit is very productive and internationally acknowledged. The number of citations is good, given the specialized character of the work done.

Productivity

Grade: Very good/Excellent

The productivity of the unit has been very good related to the size of personnel. Because of the recent reduction in the number of professors, it is somewhat difficult to evaluate to present situation, but the records given to the evaluation team show clearly that the remaining team with the lead of Prof. Jonsson has been very productive. Beside publishing articles in high-quality peer-reviewed journals, Prof. Jonsson is an author in two comprehensive books published by Cambridge University Press. The number of doctoral theses in the faculty is good in relation to the size of the unit. The number of Master theses is not so high, but that is caused by the fact that the Bachelor program is cancelled. The use of Masters by research is a very sound strategy that could be further strengthened by linking to other Master and Bachelor programs.

Research environment and infrastructure

Grade: Very good

The facilities of the unit are very good, with excellent laboratories. The collaboration with other labs to provide DNA sequencing capacity is also a strong point. These facilities allow for addressing state-of-the-art questions and have potential for more intense use, e.g. in collaboration with other academic groups. This may even generate additional funds in the future.

At the moment, the personnel situation seems to be difficult after three full-time professors have left the unit in 2012 due to the closure of the Biology program. This has considerably reduced the critical mass of the unit needed for a creative scientific community and also increases the administrative load of the remaining staff. The activity of the unit lies heavily on the expertise of a few individuals and due to few permanent positions much of the practical research activities are run by PhD and Master students. To ensure the continuity of research and critical mass of researchers, the funding of the other senior members of the staff as well as the task of laboratory assistants should be secured.

The recruitment of PhD and Master students has been successful, and complements the research of the unit significantly.

The evaluation committee recognizes that pedagogical research is relevant for a research field and training trainers but is at the same time not sure about the contribution of this research to the overall scientific work and impact of the group.

Research networks and collaborations

Grade: Excellent

Collaboration with groups inside and outside of Sweden is vital for a very good, but small group as this. The group has done a very good job in participating and partly organizing national and international collaboration, which is a highlight in the performance and impact. The committee is impressed by this, in particular the activities and impact of the Prifor network (with inclusion of 13 countries), as well as the work with Society for Conservation Biology, EFI and IPBES. This position and network offer potential and opportunities for future expansion and funding of work.

Coproduction and external non-academic cooperation

Grade: Very good

Overall, the work with non-academic partners, such as forest companies and agencies is very good given the small size of the research unit. The senior staff members are engaged in the public debate on sustainable forest management and exchange of knowledge.

Due to this collaboration, the group has good access to research sites in various forest areas. There are some relevant projects for the local county administration, Swedish Environmental protection Agency SEPA, etc.

There are several external assignments on a national level: scientific councils, forest agencies, Swedish Species Information Centre etc.

Nevertheless, there is potential for increasing the impact and also funding in the future. This could be part of an up-to-date strategy for the group.

Impact on society

Grade: Good/Very good.

In line with the previous point, the committee evaluates the impact on society of the work as very good, but also with clear potential to improve in the future.

There is good cooperation on national and international levels with practical tools and recommendations for forestry operators, examples being calculation of CWD volumes (US Forest Service), recommendations for restoration activities, studies on new fungal growth inhibitors for impregnation of wood, etc.

The current strategy of the group seems a bit conservative having a clear scientific focus. A modest position towards actual and pressing questions around forest management (e.g. the global debate on forest certification and/or the theme of increased biomass use for energy) would be advised.

Linkages with social sciences and other relevant disciplines (including groups within Miun) can increase the impact, as well as personal capacity to develop such activities. This can include increased collaboration with relevant market players as well as civil society organizations (NGOs).

Strategies and plans for development and renewal in the Unit of Assessment

Grade: Good

The SWOT analysis provided is sound and realistic. The overall strategy and scope of the group is in itself logical and sound and strongly focused on high quality scientific work.

However, the strategy also results in a high dependency on university and regional support. At the same time, the small size of the unit is a critical threat. The key problem in that sense is the context in which the group has to operate.

Addressing these key threats could be done by on the one hand engaging with university strategy and on the other hand in exploiting various opportunities to diversify activities and funding (see also recommendations below). The strategy of the group can be strengthened in this respect, but this is also a (joint) responsibility of the university.

Recommendations for development

The group has a very clear scientific focus on forest ecology and management issues. This is an important basis for the future and the high quality should be secured.

The most serious threat to the unit is its small size and strong dependence on just a few staff members, in particular the head of the department as a key person in the UoA, while the funding of key staff persons is temporary. We therefore recommend that the faculty would take actions to secure the minimum permanent staff of the UoA to be four.

The committee recommends the following:

- Strengthen the research group by more intensive collaboration with other disciplines and especially groups within Miun. In particular, elements of the work of the Ecotechnology group may even be merged with the Biology group. Another example is the Soil Chemistry group. Given that critical mass of different small research units is a more structural problem in Miun, merging a number of activities in Miun may be a good strategy to address that. In doing that, it is important to maintain the high scientific quality standards met by the Biology group.
- Linkages with Social Sciences and other relevant disciplines (including groups within Miun) can increase the impact, as well as personal capacity to develop such activities. This can include increased collaboration with relevant market players as well as civil society organizations.
- Broaden the somewhat conservative strategy of the group; there could be a redirecting part of the research towards actual and pressing questions around forest management (e.g. the global debate on forest certification, and/or the theme of increased biomass use for energy) by cooperation or redirecting research of some other Miun units.

- We also recommend paying attention to the full use of the good laboratory facilities. Visiting scientists could be attracted with the lab facilities to strengthen the input of the UoA in experimental research and also provide more future funding. There may be opportunities to make the laboratories part of a larger national or European Research Infrastructure network that can secure more efficient use and impact of the facilities.
- Ensuring the full functioning of the UoA in the future also requires successful recruitment of Master and PhD students. At the moment it is unclear how successful the recruitment of Master students to the Biology programme will be in the future, and an effort should be made to ensure the functioning of the Master by Research programme.

UoA 9.2 Ecotechnology and Environmental Science
Faculty of Science, Technology and Media

Experts: Prof. Pieter Glasbergen, Prof. André Faaij and Prof. Anna-Liisa Ylisirniö.

General assessment of the UoA

The committee has the following overall observations:

- This is a very small group with members of very diverse disciplinary backgrounds (Social Sciences, Engineering and Natural Sciences). This can be historically explained, but represents a structural challenge and problem.
- The research group recently went through a reorganisation process and was also recently informed that the composition and scope of the group may change again with the addition of the sustainable building and engineering research unit.
- The research group has not made up its mind about its future research. There is a lack of focus in the work, a lack of strategy at present and for the future and a lack of clear leadership to address those problems.
- The committee observed that, despite of the enthusiasm of the PhD students and the prospective quality of their research output, the program shows little coherence yet. Therefore, the committee really has doubts, also taking into account the recent transitions, about the future viability of the group.

Quality of research

Grade: insufficient

Overall, the quality of the output of the group as a whole is insufficient; especially due to a lack of focus. Methodological concepts are unclear and haphazard. A few individual papers contain interesting and relevant results, but the identity of group as a whole does not become clear from the total portfolio of publications.

If the publication list is compared to the reported key objectives of the group in the assessment report, which are targeting the sustainable utilisation of natural resources and the development of holistic approaches, these objectives are not backed by the research output.

Nevertheless, specifically, the energy system analysis related work is of good quality and overall published in high quality journals (e.g. Applied Energy, Journal of Cleaner Production). The key concern here is that this work was coordinated by a professor who left the group several years ago (Leif Gustavsson).

Productivity

Grade: Insufficient/Good

Output overall is satisfactory when considering staff capacity and output of publications. However, many different names pop-up in the authors list and some topics seem to recycle over the years. In addition, a considerable part of the output was generated in the energy system analysis field that was decimated with the departure of a former professor heading this field.

The committee observed that not all members of the research group contribute proportionally to the total output reported. Also, the committee observed that there is no clear publication policy and strategy in the group (e.g. in terms of the type of journals or circuits that are targeted).

Research Environment and infrastructure

Grade: Good

The committee noted that the overall work culture among the PhD researchers is positive, inspiring and enthusiastic. Internal communication among PhD researchers and the collaboration with their supervisors seemed productive. The group as a whole presented a range of papers at a conference on ecological modelling in Toulouse. This was of interest, but is so far an isolated event.

The overall strategy and leadership is unfocused and fragmented.

Research Networks and Collaboration

Grade: Good

The system of co-supervision of PhD researchers with external partners is positive; various external partners provide relevant expertise.

On the national level, there are a number of relevant linkages with other university groups. But, because of the fragmented nature of the activities in the ecotechnology and environmental science unit, these linkages do not include all key players on national levels in the different fields addressed. For example, in the field of environmental system analyses, good work is done at Lund University and SEI, but these are not mentioned.

Internationally, contacts are limited to a few specific activities (soil remediation research in Nicaragua, impact of reindeer grazing with NINA in Norway and with the university of Tartu on remediation strategies), but there are no structural networks in which the ecotechnology and environmental science group participates.

The portfolio of contacts seems fairly random and seems to be driven by expertise and interests of individuals. For example, the activities developed in Nicaragua are in themselves interesting, but are not part of a coherent strategic approach.

Coproduction and external non-academic cooperation

Grade: Good

The committee noticed that a key objective of the group is to make an impact in the region. Some external funding from companies and other organisations has been obtained, which is positive. Collaboration with various regional actors has been established.

The ambition on regional impact is addressed in a fairly pragmatic way, resulting in a number of rather different activities that have limited connections. A regional focus is in itself a good idea, but then the strategy and priorities of the research programme should be adapted and focused (see also earlier remarks).

Impact on Society

Grade: Insufficient/Good

Societal impact is raised as a key objective of the group. Societally, relevant topics are selected but as a whole, they are unfocused. Various ambitions are unrealistic. For example, the development of holistic approaches to support sustainable development of the sustainable use of natural resources are evident from the activities and in collaboration with regional partners.

Strategy

Grade: Insufficient

Implementation is not realistic and confused (particularly the holistic approach). Natural resource management is mentioned as a key objective but is not the focus of the work. The awareness of the complexity of problems is a positive point.

The programme as a whole consists of a large number of different and mostly unrelated topics that in total are too big and extensive to be handled by a group of this size.

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Recommendations

The assessment committee recognizes that recently major reorganisations and staff changes have occurred and that a new focus for the group needs to develop. The committee has serious doubts on the viability of the program as it stands and the composition of the research group in its current form.

The committee also observed that bringing in the topic of sustainable buildings and engineering is not seen as a solution to the specific problems of the ecotechnology and environmental science group as described.

We see two fundamental possibilities: either there is a fundamental revision and repositioning of the activities and reformulation of work, choosing a clear focus, or the current group and activities are split and linked to other parts and units of Miun.

In case of a fundamental reformulation of focus and position, strategic focus could come from:

- choice for focus on methods (e.g. Integrated Assessment)
- choice for specific themes (e.g. ecosystem services or development of remote areas)
- focus on a regional scale.

In the case of splitting the current activities we suggest the following:

- work on soil remediation is interesting and relevant, but may be better linked to the work of Soil Chemistry in Miun as well as Biology, which could strengthen the position of Miun in this area, especially when focused on regional conditions. With such a focus, Miun may bring valuable capacity and knowledge into the national and international arena as well.
- Work on biomass production and use, sustainability of forest resource use, etc. can be very relevant in combination with the high quality work of the biology group (on sustainability of forest management).



Appendix A – ARC13 Evaluation Package

Introduction

The following document describes the research and collaboration of defined units of assessment (UoA) at the university. The document includes indicators on research activities, research initiatives and collaboration in research in relation to academic, business, or public partners. The document also includes a qualitative self-assessment of the strengths, weaknesses, opportunities and challenges (SWOT) of the UoA. The indicators aim to describe research activities in specific areas as well as in multi-disciplinary fields, and include elements such as a description of contributions to the research field, research environment and infrastructure, research output, impact, engagement and co-operation with society (organizations within business and public sector, non-governmental organizations and the public) and opportunities for renewal and actions for successful development. The document also includes two case descriptions identified by the UoA as particularly important or significant (see C). The document is structured in three parts:

Part A – Strategic information about the UoA (general description and SWOT analysis)

Part B – Quantitative data describing the UoA (general information, research output and co-operation with society)

Part C – Case descriptions (two impact cases).

The parts are complementary. Information provided in one of the parts should be used to support and deepen the information presented in the others.

ARC13 generally assesses the period from January 2007 to the end of December 2012 (see Appendix 1), although some of the indicators cover a shorter period of time. The expert panels are asked to assess the quality of research (and collaboration) at the UoA in an international perspective based on the instructions given in the *Terms of reference* (Appendix 1). In particular, the panels are asked to identify **strong research activities, strong collaboration with society and potentially interesting opportunities for development.**

Part A:

Strategic information from the unit of assessment (UoA)

In this part of the evaluation package, the UoA communicates information on organization, co-operation and strategies chosen to ensure that relevant, high-quality research is conducted.

Table 0 – Name of the UoA	
Name of unit of assessment	
Co-ordinator of unit of assessment	

A1. Description of the research in the UoA

This is an overview of the current research areas, including primary missions and goals, within the UoA (max. four pages, in template format).

A2. Summary of the scientific results

This qualitative summary of the most important scientific results of the UoA should reflect the breadth of the research and make reference to no more than 30 publications (Table A2.1) and other research outputs (Table A2.2). The summary should include comments to the publication and a citation profile as presented in section B2.2, including the coverage of output from staff no longer affiliated to the UoA.

Table A2.1. Selected peer-reviewed publications¹

¹ Publications should be listed in Harvard format. DOI=The Digital Object identifier system. Scientific publications are added in the following format: DOI: 10.1016/j. tibtech.2007.05.002. To assist the expert panel, the listed publications should be made available as PDF documents. Where the publication takes the form of a book, two copies should be provided.

Table A2.2. Other major research outputs¹			
Type of output	Main person responsible	Description	Date when it became publicly available

¹ There is a maximum number of research output submissions allowed. The number of key research outputs, whether publication or other research output, is limited to the total number of professors within a UoA multiplied by four. The amount should be four in case the UoA does not have a professor. Internationally acknowledged research outputs include new materials, products and processes, patents, software, computer code, standards documents, evidence synthesis including systematic reviews, analyses, meta-analyses, research-based clinical case studies that add new knowledge, physical artifacts such as images, materials products and processes, prototypes, digital artifacts such as datasets, software, film and other non-print media etc.

A3. Research environment and infrastructure

In this section, the UoA presents the research environment that constitutes the context and development of its research.

A3.1 Organization of the UoA

A description of how the UoA is organized; how research is managed and quality-secured; a presentation of research groups; how fund-raising efforts are structured. (Max. two pages for UoA and an additional half page per group.)

A3.2 Personnel

Present a general analysis of staff related to personnel tables in section B1.1 (max. one page).

A3.3 Infrastructure, facilities and funding:

Provide a description of the infrastructure of the UoA (not the general infrastructure of the university) that is used to carry out research (such as laboratories, specific ICT-support, infrastructure for fund raising, collaboration with society, etc., max. three pages).

A4. The impact of engagement and co-operation with society

In this section, the UoA describes its efforts to collaborate with society to ensure that research conducted has an impact on society. The section aims to provide the basis for a more holistic and situated evaluation of research impact than is possible from the cases (described in C).

A4.1. Collaboration with society in the UoA

Give an overview of the most promising current collaboration, including primary missions and goals. Describe how current collaboration affects the quality of research. Include evidence and specific details/examples relevant to the UoA rather than broad and vague statements. Do not repeat specific details already included in the case studies (section C). (Max. four pages.)

A4.2 External collaborations and contributions that support the research within the UoA

Describe supporting key external research collaborations and contributions from actors outside the UoA. Describe facilities and advanced equipment at partner organizations that are used by the UoA. (Max. one page.)

A4.3 Innovation activities

The UoA describes the most significant innovations during 2007–2012 which have made impact (i.e., a change) on society (max. three pages). Examples of innovation

are products, designs, processes, methods, etc. The innovations can be realized within the university or by a partner and listed at the end (not included in the three pages) and should not be more than 15 pages.

A5. Self-assessment and future development

In this section the UoA should provide a self-assessment of its present opportunities for improvements. What does the UoA aim to achieve, e.g. in terms of activities within the UoA, external networking, interdisciplinary activities, joint publications and funding?

A5.1 Self-assessment of the UoA

Based on the quantitative data (Part B) and qualitative assessment above, list strengths, weaknesses, opportunities and challenges of the UoA and of the research conducted. Strengths and weaknesses refer to properties of the UoA, whereas opportunities and challenges normally refer to external factors. Propose actions that would improve the quality of the research. Consider both purely academic factors and factors related to co-operation with external partners.

The UoA must grade, on a scale of 1–8, and motivate their opportunities and ability for:

- recruiting qualified staff and PhD students,
- attracting external research funding,
- the international positioning of the UoA.

Here, 1 means poor and 8 means excellent.

Apply a long-term perspective to the strategic planning of the UoA and what priorities will be made regarding future research (max. ten pages).

Part B: Quantitative data of the UoA

In this part of the evaluation package, questions and tables are presented in three sections which contain quantifiable information about the UoA in support of the statements made in Part A above.

B1: Research environment and infrastructure

B2: Research output

B3: The impact of engagement and co-operation with society.

B1. Research environment and infrastructure

B1.1 Staff statistics

Provide information of the number of individuals and full-time equivalents (FTE) of the staff's research activity. The 'M' columns show values for men and 'W' for women. The number of individuals refers to 31 December each year, whereas FTE is integrated over the whole year. FTE is only presented for 2011 and 2012.

Year	2007		2008		2009		2010		2011		2012	
Staff ¹	M	W	M	W	M	W	M	W	M	W	M	W
Professor												
FTE												
Assoc. prof. (Lecturer and docent)												
FTE												
Assist. prof. (Lecturer, researcher)												
FTE												
Lecturer (Adjunct)												
FTE												
Total Individuals												
Total FTE												

¹ Professor denotes persons employed as full professors. Associate professor denotes staff members qualified to act as principal advisor for PhD students (docent appointment or similar). Assistant professors denote the rest of staff with a PhD.

Table B1.1.2. Number of individuals and full-time equivalents of temporary research staff													
Year	2007		2008		2009		2010		2011		2012		
Staff ¹	T	W	T	W	T	W	T	W	T	W	T	W	
Guest profs													
FTE	[REDACTED]												
Adjunct profs													
FTE	[REDACTED]												
Assistant professor													
FTE	[REDACTED]												
Post-Docs and research assistants													
FTE	[REDACTED]												
PhD students													
FTE	[REDACTED]												
Total individuals													
Total FTE	[REDACTED]												

Table B1.1.3. Other staff supporting research in UoA													
Year	2007		2008		2009		2010		2011		2012		
Staff	T	W	T	W	T	W	T	W	T	W	T	W	
Research assistant/ technician													
FTE	[REDACTED]												
Administrator													
FTE	[REDACTED]												
Total individuals													
Total FTE	[REDACTED]												

¹ Fixed term and visiting research staff. Staff is included in the research output as well as in the bibliometric analysis.

B1.2 Research funding

Sources of research funding and amounts given to the UoA annually during 2007–2012.

Table B.1.2.1. External funding (money spent in SEK)						
	2007	2008	2009	2010	2011	2012
Research Councils (VR, FAS, Formas etc.)						
Swedish Foundations (e.g. Wallenberg, SSF, Vinnova, RJ, KK, Swedish Energy Agency etc.)						
EU						
Other public bodies (e.g. county councils, municipalities, etc.)						
Direct external funding from industry.						
Others (please specify)						
TOTAL						

Table B.1.2.2. Total Research Funding						
	2007	2008	2009	2010	2011	2012
Total external funding (from Table B.1.2.1.)						
Faculty funding (governmental funding)						
Percentage external funding						
Research as competence development						
TOTAL						

B1.3 Major international collaborations

Each UoA should record the number of major international activities under-taken with partners outside of Sweden during 2011–2012 by permanent research staff.

Table B1.3.1 International networks and collaborations	
Number of collaborative institutions ¹	
Number of research visits abroad (one week to one month duration)	
Number of research visits abroad (of at least one month duration)	
Number of visiting researchers (one week to one month duration)	
Number of visiting researchers (of at least one month duration)	
Number of funded international research consortia projects	

¹ Research collaborations given here are limited to those with joint research grants in excess of 100kSEK/year and/or joint publications with the UoA.

B1.3.2 Name of project granted and role of UoA			
Project title	Funding body	Role (co-ordinator/partner)	Start year

B1.3.3 Other major international activities according to the tradition of the research field¹	Total No.

¹ Please specify: scientific expeditions, field work etc. and list below including duration. A maximum of five examples in total may be provided.

B1.4. Participation in scientific community

UoA's activities undertaken during 2007–2012 that illustrate high quality leadership interactions with their scientific peers.

B1.4.1 Participation in academic community	Number
Plenary or keynote talk at international conferences	
Assignment as expert in research councils and foundations	
Assignment as expert evaluator for position of professor, associate professor (docent) and lecturer	
Assignment as opponent for PhD thesis	
Assignment as member of examination board for PhD thesis	
Assignment as editor or member of editorial board for journal	

Assignment as reviewer for international journal	
Member of national scientific councils	
Member of international scientific councils	
Chair of program committee (international conferences)	
Member of program committee (international conferences)	

B1.5 Recruitments

Number of recruited research staff, men (M) and women (W) during 2007–2012.

B1.5.1 Recruitments	Number	
	M	W
Recruitments with doctoral degree from another Swedish university		
Recruitments with a doctoral degree from outside Sweden		
Recruitment with doctoral degree from own university		
TOTAL		

B2. Research Output

B2.1 Promotions and degrees

This section quantifies the development of scientific staff during 2007 to 2012, distinguishing men (M) and women (W).

B2.1.1. Doctoral degrees awarded and promotion of researchers												
	2007		2008		2009		2010		2011		2012	
	M	W	M	W	M	W	M	W	M	W	M	W
No. Doctoral degrees												
No. Docent promotions												
No. Professor promotions												
TOTAL												

B2.2 Publications

Publications and other research output achieved during 2007–2012 to provide the publication profile of the UoA.

Table B2.2.1: Total number of scientific publications produced by the UoA. Please specify citation index in each publication list.								
Publication types	2007	2008	2009	2010	2011	2012	Total	Period average
Article in journal, peer reviewed								
Article in journal, not peer reviewed								
Article in journal, book review								
Article in journal, review								
Book								
Edited book								
Chapter in book								
Conference paper (peer reviewed)								
Conference paper (not peer reviewed)								
Thesis, doctoral								
Thesis, licentiate ¹								
Thesis, master								
Report								
Other scientific publication								

¹ Licentiate is a Swedish and Finnish academic degree at graduate level corresponding to approx. half of a Swedish PhD.

Table B2.2.2. Aggregate publication information								
	2007	2008	2009	2010	2011	2012	Total	Period average
Total number of publications in DiVA								
Number of publications in Web of Science								

Number of publications in Web of Science, author fractionalized									
Web of Science visibility (per cent of publications included)									
Journals' field normalized impact									
Journal Impact Factor									
Norwegian score									
Norwegian score fractionalized									
Publications in level 1 journal – Norwegian list									
Publications in level 2 journal – Norwegian list									
Publications in level 1 conference – Norwegian list									
Publications in level 1 book publishers									
Publications in level 2 book publishers									

Table B2.2.3. Citation indicators										
	2005	2006	2007	2008	2009	2010	2011	2012	Total	Period average
Total number of citations										
Number of citations, author fractionalized										
Citations per publication										
Share of publications not cited										
Average field normalized citation rate										

Share of publications among the 10 per cent most cited in the field										
Share of publications among the 25 per cent most cited in the field										

Table B2.2.4. Authorship								
	2007	2008	2009	2010	2011	2012	Total	Period average
Average no. authors per publication								
Average no. countries per publication								

Table B2.2.5. Role of key scholars								
	2007	2008	2009	2010	2011	2012	Total	Period average
Share of publications by three most active authors								

Table B2.2.6. Productivity								
	2007	2008	2009	2010	2011	2012	Total	Total/Annual average
Number of publications in relation to total funding (MSEK).								
Number of publications in relation to FTEs								
Number of citations in relation to FTEs								

B2.3 Innovation output

As well as engaging with society through contract research or education, researchers today sometimes patent their findings, commercializing these through multiple routes. Researchers also form companies based either on patents or other forms of intellectual property, e.g. materials, software or experience. These activities, often referred to as ‘innovation activities’, are listed in the tables below for the years 2007–2012.

B2.3.1. Patents¹			
Patent number ²	Short description	Person(s) involved at UoA	Date of registration

¹ Data should match that held by DiVA.

² Awarded patents only, not patent applications.

B2.3.2. Founded companies¹				
Company name	Founder(s) from the UoA	Company type	Date of formation	Current status

¹ All eligible companies must be a direct result of the university’s research activities and have, or have had, an annual income in excess of 100k SEK.

B3. The impact of engagement and co-operation between research and society

This section presents activities related to co-operation between research and society and the impact of such activities. It includes the unit’s general approach to enabling impact and engagement from its research, and also specific examples of impacts that have been underpinned by research undertaken by the UoA.

B3.1 PhD degrees

The number of doctoral degrees (PhD, etc.) earned within the UoA during 2007–2012 when the awardee was employed externally. Number of men (‘M’) and number of women (‘W’) are recorded per year.

Table B3.1.1. Doctoral degrees awarded to students employed externally												
	2007		2008		2009		2010		2011		2012	
	M	W	M	W	M	W	M	W	M	W	M	W
Number of doctoral degrees												

B3.2 Major research related co-operation with society

Activities regarding research related co-operation with society should be entered into one of three categories in the table below: Table 3.2.1 lists mobility between academia and non-academic society, such as exchanged lectures with external (non-academic) organizations, the engagement of adjunct professors, and externally financed PhD students in collaborative research projects with partners from industry or other organizations in society; Table 3.2.2 includes the number of publications co-authored with individuals outside of academic institutions, and popular publications aimed at the general public; Table 3.2.3 counts the number of external partners of the UoA divided between SME, large enterprises, and non-industrial partners; Table 3.2.4 summarizes the amount of in kind funding from industry and non-industrial organizations in society.

Table 3.2.1: Mobility between academia and society						
	2007	2008	2009	2010	2011	2012
No. of collaborative doctoral students ¹						
No. of temporary research positions outside university ²						
No. of adjunct researchers						

¹Number of doctoral students in the UoA who are financed by non-academic external partners. Note that this does not mean doctoral students who are financed by any non-academic funding body, but students who are financed by external partners of the UoA (e.g. industry or public sector organizations).

²Permanent UoA personnel who leave the university for non-academic society.

Table 3.2.2: Outreach activities						
	2007	2008	2009	2010	2011	2012
No. of scientific publications with representatives from society (not academia)						
No. of popular science publications (popular science magazines, including those on the internet)						

Table 3.2.3: Collaborative organizations (please provide description in A3.1.)						
	2007	2008	2009	2010	2011	2012
No. of partners from industry (SME) ¹						
No. of partners from industry (non-SME)						
No. of partners from society excl. industry and academia						

¹enterprise with no more than 250 employees and an annual turnover not exceeding 50M €.

Table 3.2.4: Indirect external funding (in M SEK)						
	2007	2008	2009	2010	2011	2012
Indirect funding from non-industrial organizations in society (in kind ¹)						
Indirect external funding from industry (in kind)						

¹value of working hours done by external partners, value of equipment, databases, software, laboratories etc. that external partners provide in joint research projects.

Part C: Case descriptions

C.1. Impact case

The number of cases required in each submission is two (max.). The case should have been carried out during the period 1 January 2007 to 31 December 2012. Each case must provide details not only of the academic impact e.g. publications in highly ranked journals, but also describe the impact of the exemplary research on society (e.g. economy, industry, society, culture, public policy or services, health, the environment or quality of life, beyond academia).

Table C1.1.2 Template for impact cases (maximum four pages)
Title of case
Describe and provide evidence of the specific impact, including: <ul style="list-style-type: none"> - an explanation of the nature of the impact, - how far-reaching the impact is/who the beneficiaries are, - how significant the benefits are.
Explain how the UoA research activity contributed or led to the impact, including: <ul style="list-style-type: none"> - an outline of what the underpinning research was, when this was undertaken and by whom, - what efforts were made by staff in the unit to exploit or apply the findings or secure the impact through its research expertise, - acknowledgement of any other significant factors or contributions to the impact.

Provide references to:

- key research outputs evidencing the impact (list of publications, patents etc.),
- other external reports or documents, or contact details of a user that could corroborate the impact and contribution of the UoA.

Any other aspect the UoA wants to highlight.

Appendix B – Instructions to the experts ARC13

Assessment of research and coproduction 2013 (ARC13) aims at identifying strong areas of research in the broad spectrum of research at Mid Sweden University. As such, ARC13 will provide means to strengthen the quality of the scientific activities at the university by offering reliable background material for future strategic decisions. The evaluation will also support the Units of Assessment (UoAs or simply Unit) in their work on formulating plans for future research. The evaluation is aimed at assessing performance and prospects of the Unit of Assessment as whole, not individual scientists. The reports and presentations from the UoAs (written and oral) on their own work constitute the basic material for the evaluation.

Objectives and criteria of the evaluation

The research of the University is organized in research centers and scientific disciplines (named Units of Assessment, UoA in ARC13) in a relatively heterogeneous structure, in which research of diverse character is conducted. Each Unit has been assigned an expert panel. In the cases where research at different Units is sufficiently related, these have been grouped together to represent a research area that can be evaluated by an expert panel. The expert panels are constituted by both national and international experts in the field of their Unit and should work as a group to attain a collective assessment, making use of the complementary expertise among the members.

The expert panels are requested to assess the quality of research and co-production/ collaboration with external partners of the Unit in a national and international perspective. In particular, the panels should identify strong research areas and areas that have potential to grow strong. The aim is not to compare the Units at Mid Sweden University with each other. Instead it aims at probing the standing of the UoA in national and international perspectives, reflecting the quality and potential of each UoA. The assessment shall be based on the reports and presentations given to the panel even in the case that some activities are left out.

In the following are given headlines under which the panels are requested to provide comments and recommendations on improvements.

1. General assessment of the UoA

Give a brief account of the overall impression of the research conducted in the UoA.

2. Aspects for grading the research

Comment on the quality of the research from a national and international perspective, with emphasis on identifying areas of strong research and successful constellations. Rate the quality of the research in the seven dimensions listed below using

the grades "Excellent", "Very Good", "Good" and "Insufficient". Section 3 suggests some criteria for these grades. The panel is welcome to adjust the criteria depending on the assessment dimension and nature of the research area as long as you document and motivate it in your report.

2.1 Quality of research

Quality of research includes the international visibility and the impact to the scientific community (e.g. in terms of citations) and publications in leading journals and/or monographs. It includes the reputation and position of the Unit in the international research community. The ability of the Unit to achieve and present clear scientific analyses and new results should also be considered. The assessment should reflect the position of the Unit in relation to the internationally leading research units.

2.2 Productivity

Productivity relates to the total volume of scientific publications of the Unit. The quantification of production is evaluated by means of bibliometric indicators, the number of licentiate and PhD degrees awarded, and promotions of docents and professors. Productivity and its impact should be judged in relation to the number of researchers and the time they can use for research in the Unit.

2.3 Research environment and infrastructure

Comment on the research environment, its organization, staff profile and diversity, resources and activities. Comment on the adequacy and availability of the infrastructure. Also comment on the research environment with respect to internal coherence, multi- and interdisciplinary activities, outreach activities, demographic, gender profile and leadership. The research infrastructure can be available through collaboration networks. If this is the case, please comment on this and the Unit's ability to make use of these external resources.

2.4 Networks and collaborations

Comment on the extension, quality, and intensity of collaboration that the Unit has in national and international academic networks. To what degree are the academic partners integrated with the Unit and contribute with their competence to the joint research?

2.5 Coproduction and external cooperation

Comment on the extension and quality of national and international collaborations with non-academic partners and society. To what degree are the non-academic partners integrated with the Unit and contribute with their competence to the research? Evaluate the contribution of the partners. Do the coproduction and cooperation improve the conditions for and quality of the research?

2.6 Impact

Comment on the impact of the Unit's research on society. Specifically evaluate the significance that the impact cases presented by the Unit have had for society and the non-academic partners.

2.7 Strategies and plans for development of the Unit

Assess the visions, goals and strategies of the Unit as well as their feasibility and prospect for success. Assess the activities to support the development of junior faculty members.

3. Grading scale:

The following guidelines are suggested for the grading:

Excellent – Internationally leading quality and visibility.

Very good – Nationally leading and internationally good and recognized.

Good – Nationally good and internationally promising.

Insufficient – The research does not meet basic scientific quality criteria at national level. Research activities should be revised.

At the end of the document you will find more details on the grading scale system. In some cases, research of very high quality may have remained completely at the national level due to research traditions of the research field. If you see examples of research that should have been made available to the international research community, then please comment on this.

In all cases, the grading is given for the Unit as a whole. You are welcome to comment on individual research groups within the Unit if you feel that they warrant special attention.

4. Experts views on potential and recommendations for development

Give recommendations for further improvement of any aspect of the research quality of the Unit.

5. Other issues

Make other appropriate comments.

6. Report format

The report from the expert panel should be organized under the following headings

1. General assessment
2. Quality of research
3. Productivity
4. Research environment and infrastructure
5. Research networks and collaborations
6. Coproduction and external non-academic cooperation
7. Impact on society??
8. Strategies and plans for development and renewal in the Unit of Assessment
9. Recommendations for development
10. Other issues

Appendix C – Grading Scale

Excellent	Quality Wide international attention, most prominent channels, world leading research.	Productivity Very high number of PhDs, promotions, and publications in relation to UoA resources. The emphasis is on the number of publications.	Infrastructure Leadership, constitution of staff, activity, ability to attract external funding is excellent in all aspects.	Collaborations The national and international collaboration is wide and relevant with very high quality partners. Academic partners that contribute to the research.	Coproduction The collaboration with very high quality partners is wide and relevant regarding partner contribution to joint research. The research has high value with strategic importance for the external partners.	Impact The research has international reach and is of high significance to society.	Renewal Strong, clear visions, and realizable strategies. Very promising junior faculty activities.
Very Good	International attention, recognized channels, nationally leading research.	Above average number of PhDs, promotions, and publications in relation to UoA resources. The emphasis is on the number of publications.	Leadership, constitution of staff, activity, external funding is very good in most aspects.	The national and international collaboration is wide and relevant with high quality partners. Academic partners that contribute to the research.	The collaboration with high quality partners is wide and relevant regarding partner contribution to joint research. The research has a high value for the external partners.	The research has international reach and is of significance to society.	Clear visions, and realizable strategies. Promising junior faculty activities.

	Quality	Productivity	Infrastructure	Collaborations	Coproduction	Impact	Renewal
Good	National attention, recognized channels, near the research front.	Average number of PhDs, promotions, and publications in relation to UoA resources. The emphasis is on the number of publications.	Leadership, constitution of staff, activity, ability to attract external funding is satisfactory in all aspects.	The collaboration is wide and relevant. Academic partners contribute to some extent to the research.	Relevant collaboration partners. Non-academic partners contribute to the research. The research has value for the external partners.	The research has national reach and is of some significance to society.	Visions and strategies need some development. Sufficient junior faculty activities.
Insufficient	The research is insufficient and reports have not gained wide circulation or do not receive national and international attention.	Clearly below average number of PhDs, promotions, and publications in relation to UoA resources. The emphasis is on the number of publications.	Leadership, constitution of staff, activity, ability to attract external funding is clearly unsatisfactory in several aspects.	The collaboration is insufficiently developed.	The collaboration is insufficiently developed.	Lack of reach, or minor significance of research to society.	Unrealistic or lacking visions and strategies.

Appendix D – National Steering Committee and Working Groups

National Steering Committee:

Mid Sweden University:	Hans-Erik Nilsson Jonas Harvard Örjan Sundin
Halmstad University:	Thorsteinn Rögnvaldsson, Pernilla Nilsson
University of Skövde:	Noel Holmgren, Lars Niklasson Anne Persson

National Scientific Working Group:

Mid Sweden University:	Bengt Helmann Håkan Wiklund Anna Olofsson
Halmstad University:	Håkan Pettersson Pernilla Nilsson Henrik Florén
University of Skövde:	Noel Holmgren Tom Ziemke Stefan Tengblad

National Co-production Working Group:

Mid Sweden University:	Mikael Gidlund Folke Österberg Mattias Fuchs
Halmstad University:	Magnus Hållander Jens Nygren Max Lundberg
University of Skövde:	Anna Syberfeldt Lars Niklasson Noel Holmgren Leif Pehrsson
Knowledge Foundation:	Susanne Andersson

National Bibliometrics Working Group:

Mid Sweden University:	Britt-Marie Sohlström
Halmstad University:	Peter Lindgren
University of Skövde:	Lisa Grönborg

Appendix E – Mid Sweden University ARC13 Organisation

Mid Sweden University Steering Committee

Anders Söderholm, Vice-Chancellor

Mats Tinnsten, Pro Vice-Chancellor

Håkan Stenström, Head of Administration

Morgan Palmqvist, Chief Librarian

Hans-Erik Nilsson, Dean Faculty of Science, Technology and Media

Susanna Öhman, Dean Faculty of Human Sciences

Johan Liljeholm, Student Representative

Lars Nilsson, Secretary

Start-up Team

Jonas Harvard, Chair

Matthias Fuchs

Mikael Gidlund

Johan Landin

Bengt Oelmann

Karin Olsson

Anna Olofsson

Britt-Marie Sohlström

Håkan Stenström

Kicki Strandh

Örjan Sundin

Maria Torstensson

Lars Våge

Håkan Wiklund

Thomas Eriksson*

General Working Team

Håkan Wiklund, Project Leader ARC13

Jan-Erik Berg

Annika Berggren

Fanny Burman

Märit Christiansen

Anna Haeggström

Jessica Lif

Åsa Lindgren

Veronica Norman

Kerstin Nyström

Katarina Rydén

Britt-Marie Sohlström

Maria Torstensson

Lars Våge

Eva Wiktorsson

Jon Nyhlén

Thomas Eriksson*

Editorial Team

Håkan Wiklund, Project Leader ARC13

Matilda Eliasson

Jon Nyhlén

Örjan Sundin

Maria Torstensson

Thomas Eriksson*

*Consultant at AB Realisator Management Consulting

Appendix F – Definition of Bibliometric Indicators Calculated by the University Library

In the definitions below it is described how the total value for Mid Sweden University is calculated for each indicator. In order to calculate each Unit of Assessment's (UoA) share of that value, a list of researchers, whose publications should be included in the evaluation of a specific UoA, have been used. The researcher/UoA mapping is specified in the file ID_UoA.xlsx.

Within the tables, references are made to two bibliographic systems. One is Web of Science, which is an internationally well-known citation database created by Institute for Scientific Information, now maintained by Thomson Reuters. The other one is DiVA, which is a Swedish research database and e-publishing platform. All publications written by Mid Sweden University researchers are entered into this database. It is therefore used to measure the amount of publications that each UoA has published during the evaluation period.

Another system that is used in this document is the Norwegian model for assessing publication performance. A short introduction to this bibliometric system can be found at this URL:

<http://hj.se/bibl/en/publishing/bibliometrics/evaluative-bibliometrics/the-norwegian-model.html>

Lists of publication channels recognized and evaluated by the Norwegian model can be found at this URL: <http://dbh.nsd.uib.no/kanaler/>

Table B2.2.1

The number of publications in DiVA is the sum of all publications retrieved from DiVA, with at least one author affiliated to Mid Sweden University. The publications must be published (not submitted, in press or other) in order to be retrieved.

For journal articles, this means that if they have only been published online, they are not retrieved unless they have been assigned to a journal issue.

For definition of publication types in DiVA see the SWEPUB web site: <http://swepub.kb.se>

Table B2.2.2

Total number of publications in DiVA

See definition above for Table B2.2.1

Number of publications in Web of Science

The number of publications in Web of Science with at least one author affiliated to Mid Sweden University. Journal articles, letters, review articles and proceedings papers included.

Number of publications in Web of Science, author fractionalized

The author fractionalized number of publications is the sum after assigning each publication the value 1 and dividing the assigned value by the number of authors. Then the shares of the Mid Sweden University researchers are summarized.

Web of Science visibility (percent of publications included)

The Web of Science visibility factor is calculated by dividing the number of publications in WoS by the number of publications in DiVA for the same publication period.

Norwegian Score

Score calculated for publication types like articles, books, chapters and conference papers according to the Norwegian model. If a publication is present in WoS, but not in the Norwegian list, it has been calculated as a level 1 publication in this score.

Norwegian score, author fractionalized

The author fractionalized Norwegian score is the sum of the score after dividing the score for each publication by the number of authors of that publication. Then the shares of the Mid Sweden University researchers are summarized.

Publ in level 1 journals - Norwegian list

The number of articles that have been published in level 1 journals according to the Norwegian list.

Publ in level 2 journals - Norwegian list

The number of articles that have been published in level 2 journals according to the Norwegian list. 20% of the journals in each field are assigned to level 2 in the system.

Publ in level 1 conferences – Norwegian list

The number of conference papers that have been published in level 1 publishers according to the Norwegian list.

Publ in level 1 book publishers - Norwegian list

Number of book chapters or books published by level 1 publishers according to the Norwegian journal list.

Publ in level 2 book publishers - Norwegian list

Number of book chapters or books published by level 2 publishers according to the Norwegian journal list.

Table B2.2.3**Total number of citations**

The total number of citations in Web of Science since the year of publication. Self-citations included. Journal articles, letters, review articles and proceedings papers included. Publications with publication year 2005- are included. Year is the publication year, so the yearly sum is a count of citations for publications published that year.

Number of citations, author fractionalized

The author fractionalized number of citations is the sum of citations in Web of Science to a publication set after dividing the number of citations for each publication with the number of authors of that publication. Then the shares of the Mid Sweden University researchers are summarized.

Citations per publication

Total number of citations divided with the number of publications used for citation count.

Share of publications not cited

Number of publications with citation count = 0, divided with number of publications used for citation count.

Journals field normalized impact

The field normalized citation rate (see definition below) is calculated taking into account citations for each article published in the journal during the 3 preceding years, and the average field normalized citation rate for the subject area. Then an average field normalized impact value is calculated for the journal.

The Field normalized citation rates used in ARC13 are calculated by the Library at Karolinska Institutet. Conference proceedings are not included. The indicator is an average of the Field normalized impact of the journals, in which articles were published the specific time period.

Average field normalized citation rate

The number of citations to a publication divided with an average of citations within the field (calculated from the total amount of publications in WoS, using the subject categories in WoS). The value means that a publication with a value < 1 is cited lesser than the average for articles in the field and a value > 1 means the publication is cited more.

The Field normalized citation rates used in ARC13 are calculated by the Library at Karolinska Institutet. Conference proceedings are not included. Year is publication year, so the yearly average is an average of citations for publications published that year.

Journal Impact factor

This indicator is collected from Web of Science. The impact factor for a journal is calculated based on a three-year period, and can be considered to be the average number of times published papers are cited up to two years after publication. More information about Thomson Journal Impact factor:

http://thomsonreuters.com/products_services/science/free/essays/impact_factor/

The indicator is an average of the Journal Impact factor of the journals, in which articles were published that time period.

Share of publications among the top 10 percent most cited in the field

Publications are given a percentile value reflecting the number of citations to the document and the total number of publications within the same subject category and publication year in WoS.

Time period: publications with publication year 2005-. Publications registered in Web of Science Conference proceedings are not included. The top 10 percent has a percentile value higher than 0,9.

In ARC13 the percentile values have been calculated by the Library at Karolinska Institutet.

Share of publications among the top 25 percent most cited in the field

Publications are given a percentile value reflecting the number of citations to the document and the total number of publications within the same subject category and publication year in WoS.

Time period: publications with publication year 2005-. Publications registered in Web of Science Conference proceedings are not included. The top 25 percent has a percentile value higher than 0,75.

In ARC13 the percentile values have been calculated by the Library at Karolinska Institutet.

Table B2.2.4

Average authors per publication

The number of authors has been calculated for all publications, and the sum has then been divided with the total amount of publications.

Average countries per publication

Country for co-authors not affiliated to Mid Sweden University has been determined from affiliation in WoS or from the original publication. All publications has been assigned the value=1 (Sweden) and then other home countries for co-authors have been added and an average has been calculated.

Table B2.2.5

Share of publications by 3 most active authors

Most active authors are determined by calculating the number of authors contributions, that is if a researcher has been author or co-author to x number of publications, he or she has x author contributions. The number of author contributions of the 3 most active authors is then divided with all author contributions for the time period.

Table B3.3.2

No. of scientific publ. with representatives from society (not academia)

Co-authors that are representatives from society (not academia) have been detected from affiliation in WoS or from the original publication. Then the number of publications with at least one such has been counted.

No. of popular science publ. (popular science magazines incl. Internet)

The number of publications in popular science publications according to the content type “Other (popular science, discussion etc)” in DiVA. When this content type has been used in conjunction with the publication type Patent, these have not been included in the count.

Appendix G – Instructions to the Generalists ARC13

Objective

The overall objective with the generalist evaluation panel (IGEP) is to contribute to the institutional strategy of Mid Sweden University in the next 5-10 years by assessing the contribution of the 7 research centres to the SWOT of the institution as a whole. In addition, each research centre should be assessed in accordance with the description below and recommendations for improvements should be given for each research centre.

Role and Focus for the Generalist interview sessions

Mid Sweden University has divided its research into 33 Units of Assessment (UoA) that has been grouped together in 9 research fields. An international scientific evaluation panel (ISEP) for each of the 9 research fields will undertake the evaluation of each UoA, within the corresponding research field, regarding scientific quality and societal relevance.

Among the UoAs are 7 research centres. The research centres are the centres for high quality research in the profile areas and some other research areas, but they also serve as a platform for collaboration with financiers and other interested parties. Beside their scientific quality and societal relevance, these centres will also be assessed on how they act as a Mid Sweden University centre by a generalist evaluation panel (GEP).

Together with the ISEP for the corresponding UoA, the GEP will meet with each centre in a separate interview session chaired by the GEP chairman to shed light on items like:

- 1) Long-term vision, mission and strategy
 - a) Long-term perspective on the vision, mission and strategy of the centre in the context of being a successful centre
- 2) Centre partners (interested parties) – Companies and public service partners
 - i) Concerning each partner
 - (1) The corporate profile of the centre's partners (number of employees, main products, location of operations etc.)
 - (2) How their business interests are aligned with the research efforts of the centre
 - (3) How they interact with the centre (including planning, personnel and facilities)
 - ii) Concerning the overall strategy and considering the centre as a whole:
 - (1) The way in which key issues are identified by partners to stimulate needs-driven research

- (2) 2) The mechanisms for innovation and translation of research output and knowledge into new products, processes, and services
 - (3) Measures taken to achieve strong links and integration between academia and partners; and among the partners
- 3) Financial situation
 - a) Concerns regarding financing matters
 - b) Existing sources of non-centre funds supporting related research
- 4) Organization and management of the centre
 - a) Organization chart
 - b) Role and activities of key personnel in the organization chart like:
 - i) Board of Directors
 - ii) Centre Director
 - iii) Management Team
 - iv) International Scientific Advisory Board
or corresponding functionalities
 - c) The scientific leadership of the centre
 - d) The process of:
 - i) Idea generation
 - ii) Idea development
 - iii) Project selection
 - iv) Project planning
 - v) Project review
 - e) Steps taken to stimulate innovation processes from ideas/results to products and services?
 - f) The status and role of the centre vis-à-vis the:
 - i) University organizational units
 - ii) Central administration
 - iii) The faculty
 - iv) Other centres
- 5) Personnel of high competence
 - a) Contribution of the centre to university education (graduate and undergraduate): e.g. courses taught, seminars given, etc.
 - b) Measures taken to recruit, develop and keep people with leading international competence
 - c) The percentage of students associated with the centre who's first degree is from:
 - i) Another university
 - ii) Outside Sweden
 - d) Measures taken to provide opportunities for students to travel or study abroad

Report format

The report of the expert panel should be organized under the following headings for each research centre:

1. General assessment
2. Strategy – What business are we in?
3. Efficacy – Do we do the right things?
4. Efficiency – Do we do the things right?
5. Recommendations to the RC

Each report should consist of approximately 5 pages.

In addition, the IGEP should write a separate report where the contribution of the 7 research centres as a whole is assessed and general recommendations are given to Mid Sweden University.

Appendix H – Conflict of Interest

In order to secure that there was no conflict of interest between the evaluated UoA and each evaluator, the following multi-step process was used.

Step 1:

The UoA declared that there was no conflict of interest between the proposed evaluator candidates and the UoA.

Step 2:

The contacted evaluators declared that there was no conflict of interest with any of the UoAs within the RF they would evaluate.

Step 3:

For each evaluator candidate that accepted the invitation, there was an additional control of any conflict of interest, performed through bibliometrics. The initial search collected the publication with the evaluator as author. A set up of different ways of spelling the name was controlled, including initials and change of name through e.g. matrimony.

This was followed by a search using the most appropriate ways to spell the evaluators name in combination with the affiliation of Mid Sweden University. The affiliation can be referred to in many ways, e.g. “Mid Sweden University”, “Midsweden University”, “Mittuniversitetet”, “Mithögskolan”, and “Mitthogskolan”. In case such combinations were found, further analysis would take place to clarify the relation between the evaluator and Mid Sweden University. All such findings of relations were to be denoted and reported.

The bibliometric searches were performed using the following databases:

- SwePub – the national research database. SwePub currently contains references to research publications registered in currently approximately thirty of the Swedish university publication databases, see link <http://swepub.kb.se>
- LIBRIS – the national bibliographic database. LIBRIS is a national search service providing information on titles held by Swedish universities and research libraries, as well as about twenty public libraries. Here, you can find books, periodicals, articles, maps, posters, printed music, electronic resources, etc, see link <http://libris.kb.se>
- Scopus – an international citation database. Scopus, the largest abstract and citation database of peer-reviewed literature, features smart tools

to track, analyze and visualize research. Scopus delivers the most comprehensive overview of the world's research output in the fields of Science, Technology, Medicine, Social sciences and arts and Humanities. Scopus has a broader coverage when it comes to subjects and number of articles in journals. See link <http://www.elsevier.com/online-tools/scopus>

- Web of Science – an international citation database. Web of Science™ provides quick, powerful access to the world's leading citation databases. Authoritative, multidisciplinary content covers over 12,000 of the highest impact journals worldwide, including Open Access journals and over 150,000 conference proceedings. You'll find current and retrospective coverage in Sciences, Social sciences, arts, and Humanities, with coverage to 1900 – which is a better coverage backwards than what Scopus provides. See link <http://thomsonreuters.com/web-of-science-core-collection/>
- PRIMO and Google Scholar – databases that provide international general bibliographic searches.
- In addition, international specialized bibliographic searches were performed using the most specialized databases for the topic of interest. This implies that certain adaptations have been made, e.g. the database INSPEC was used for Engineering Physics, PUBMED for Health Sciences, MATHSCINET for Mathematics etc.

Step 4

Besides the steps describes above, a general Google search was performed in order to find out any other obvious conflict of interest that was not found in the earlier steps.

Appendix I – International Evaluation Panels

1. International Generalist Expert Panel

Generalist evaluators of the research centres i.e:

UoA 1.1 Centre for Research on Economic Relations (CER)

UoA 1.2 The European Tourism Research Institute (ETOUR)

UoA 2.1 Swedish Winter Sports Research Centre (SWSRC)

UoA 3.1 Risk and Crisis Research Centre (RCR)

UoA 6.1 DEMICOM

UoA 7.1 Fibre Science and Communication Network (FSCN)

UoA 8.1 Sensible Things That Communicate (STC)

Dr. Harry Fekkers, Chair

University of Maastricht

The Netherlands

Dr. Rolf Ericsson

Rolf Ericsson Affärs- och teknikutveckling AB

Sweden

Mrs Christina Johannesson

Kontigo AB

Sweden

2. International Scientific Expert Panels

2.1 Panel 1. Scientific evaluators for Research Field 1 Economic Sciences, Law and Tourism, i.e:

UoA 1.1 Centre for Research on Economic Relations (CER)

UoA 1.2 The European Tourism Research Institute (ETOUR)

UoA 1.3 Business Administration

UoA 1.4 Economics and Statistics

Professor Miriam Scaglione, Chair

University of Applied Sciences

Western Switzerland

Switzerland

Mrs Stina Algotsson
The R&D Fund of the Swedish Tourism & Hospitality Industry
Sweden

Professor Peter Berck
UCLA, Berkeley
USA

Professor Falconer Mitchell
University of Edinburgh
United Kingdom

Professor Inger Johanne Pettersen
Trondheim Business School
Norway

Professor Soile Veijola
University of Lapland
Finland

2.2 Panel 2. Scientific evaluators for Research Field 2 Health Sciences, i.e:

UoA 2.1 Swedish Winter Sports Research Centre
UoA 2.2 Sport Science
UoA 2.3 Public Health
UoA 2.4 Nursing Sciences
UoA 2.5 Rehabilitation Science

Professor Annie Rouard, Chair
Université de Savoie
France

Professor Paola Cesari
University of Verona
Italy

Manager Petra Dannapfel
County Council of Östergötland
Sweden

Professor Elizabeth Kendall
Griffith University
Australia

Dr. Laurie Lachance
University of Michigan
USA

Dr. Tony Ryan
University of Sheffield
United Kingdom

**2.3 Panel 3. Scientific evaluators for the Research Field 3 Social Sciences,
i.e:**

UoA 3.1 Risk and Crisis Research Centre
UoA 3.2 Sociology
UoA 3.3 Criminology
UoA 3.4 Political Sciences

Professor Havidán Rodríguez, Chair
University of Texas - Pan American
USA

Professor David Farrell
University College Dublin
Ireland

Dr. Kjell Mo
Prime Minister's Office
Sweden

Professor Jo Phoenix
University of Leicester
United Kingdom

2.4 Panel . Scientific evaluators for the Research Field 4 Humanities, i.e:

UoA 4.1 English

UoA 4.2 History

UoA 4.3 Literary Studies, Religious Studies, Spanish, Swedish Language

Professor Katarzyna Marciniak, Chair

Ohio State University

USA

Professor Gunnar W Knutsen

Telemark University College

Norway

Professor Tomás Albaladejo Mayordomo

Universidad Autónoma de Madrid

Spain

2.5 Panel 5. Scientific evaluators for the Research Field 5 Behavioural Sciences, i.e:

UoA 5.1 Social Work

UoA 5.2 Psychology

UoA 5.3 Educational Science

Professor Joanne Hughes

Queens University

United Kingdom

Professor Liisa Keltikangas Järvinen

Helsinki University

Finland

Professor Narda Razack

York University

USA

2.6 Panel 6. Scientific evaluators for the Research Field 6 Media and Communications, i.e:

UoA 6.1 DEMICOM/Media and Communications Studies

UoA 6.3 Quality Technology and Management

UoA 6.4 Information Systems

Professor Katrin Voltmer, Chair

University of Leeds

United Kingdom

Professor George Bohoris

University of Piraeus

Greece

Professor Risto Kunelius

University of Tampere

Finland

Professor Julie McLeod

Northumbria University

United Kingdom

2.7 Panel 7. Scientific evaluators for the Research Field 7 Engineering Sciences, i.e:

UoA 7.1 Fibre Science and Communication Network

UoA 7.2 Chemistry

UoA 7.3 Chemical Engineering

UoA 7.4 Mathematics

UoA 7.5 Sports Technology

UoA 7.6 Engineering Physics

Professor James Olson, Chair

University of British Columbia

Canada

Professor Angeles Blanco

Complutense University of Madrid

Spain

Former Research Director Lars Gädda
Forestcluster Ltd
Finland

Professor Alison McKay
University of Leeds
United Kingdom

Professor Janne Laine
Aalto University
Finland

Professor Bandaru V. Ramarao
State University New York
USA

Professor Joachim Rosenthal
University of Zürich
Switzerland

Professor Kerstin Witte
University of Magdeburg
Germany

2.8 Panel 8. Scientific evaluators for the Research Field 8 Computer and Information Sciences, i.e:

UoA 8.1 Sensible Things That Communicate
UoA 8.2 Computer Science
UoA 8.3 Electronics

Professor Bradford Nickersson, Chair
University of Brunswick
Canada

Dr. Bernt Ericsson
Innovation Impact AB
Sweden

Professor Martin Glesner
Technische Universität Darmstadt
Germany

Professor Chunming Rong
University of Stavanger
Norway

Professor Manos Tentzeris
Georgia Institute of Technology
USA

2.9 Panel 9. Scientific evaluators for the Research Field 9 Biology and Environmental Sciences, i.e:

UoA 9.1 Biology
UoA 9.2 Ecotechnology and Environmental Science

Professor Pieter Glasbergen, Chair
University of Maastricht
The Netherlands

Professor André Faaij
Utrecht University
The Netherlands

Professor Anna-Liisa Ylisirniö
University of Lapland
Finland

Appendix J – Main Bibliometric Data

Unit of Assessment:	Publications in Diva	Average number of authors	Average number of countries per publication	Share of publications by 3 most active authors	No. of scientific publ. with representatives from society	No. of popular science publ.	Publications in level 1 and 2 channels - Norwegian list	Visibility in Norwegian list level 1 and 2	Norwegian Score	Norwegian Score fractionalized	Normalized score/Publication in DIVA	Publications in Web of Science	Number of citations, author fractionalized	Citations per publication	Journal Impact Factor	Visibility in KI Web of Science				
1.1 Centre for Research on Economic Relations	101.1	2.3	1.1	47%	3.0	3.0	35.5	33%	37.9	31.3	0.37	8.8	7.5	9%	24.0	11.2	2.4	1.2	4%	
1.2 The European Tourism Research Institute	191.6	2.5	1.4	47%	18.0	7.0	91.2	48%	95.5	56.3	0.50	25.0	16.2	13%	38.0	28.2	1.5	1.0	8%	
1.3 Business Administration	148.1	2.3	1.1	36%	4.0	7.2	48.0	32%	52.9	39.7	0.36	16.0	10.8	11%	61.5	27.7	3.2	0.9	4%	
1.4 Economics and Statistics	51.5	2.0	1.1	74%	2.0	1.0	21.3	41%	26.3	18.3	0.51	9.8	6.4	19%	6.5	5.2	0.6	0.9	16%	
2.1 Swedish Winter Sports Research Centre	224.3	3.8	1.6	61%	13.9	9.0	116.1	52%	147.9	60.5	0.66	85.6	83.0	34%	38%	252.4	102.3	3.4	1.9	31%
2.2 Sport Science	215.1	4.0	1.7	57%	15.7	8.0	124.5	56%	161.4	57.6	0.75	85.0	27.2	39%	269.8	79.7	3.0	2.1	30%	
2.3 Public Health	91.3	7.6	3.0	62%	15.0	7.0	58.8	64%	86.1	28.7	0.94	45.9	16.5	50%	194.0	66.3	1.8	2.5	47%	
2.4 Nursing Sciences	251.2	3.1	1.2	36%	18.8	9.0	168.7	67%	117.3	87.8	0.78	109.2	57.9	43%	606.3	318.8	4.8	1.3	40%	
2.5 Rehabilitation Science	74.8	3.1	1.3	49%	9.8	3.5	53.6	72%	58.6	34.8	0.78	30.5	17.9	41%	90.5	50.6	2.4	1.2	28%	
3.1 Risk and Crisis Research Centre	239.9	2.3	1.1	33%	5.0	2.0	82.0	34%	93.6	71.6	0.39	30.2	23.3	13%	44.8	38.8	1.5	0.9	6%	
3.2 Sociology	183.7	1.7	1.1	33%	0.0	6.5	63.2	34%	82.7	71.0	0.45	28.5	23.2	16%	55.0	32.3	1.7	1.2	10%	
3.3 Criminology	26.8	2.9	1.4	92%	3.0	0.0	19.0	71%	27.4	14.1	1.02	13.0	5.2	48%	139.0	63.6	9.3	1.7	26%	
3.4 Political Sciences	50.7	1.4	1.1	55%	0.0	0.0	13.0	26%	19.6	16.2	0.39	1.0	0.3	2%	38.0	25.3	9.5	-	1%	
4.1 English	57.5	1.8	1.3	63%	0.0	3.5	48.7	85%	48.7	38.6	0.85	4.0	3.3	7%	9.0	4.3	2.3	-	2%	
4.2 History	85.0	1.1	1.0	52%	0.0	4.0	27.0	32%	39.4	38.6	0.46	2.0	2.0	2%	0.0	0.0	0.0	-	1%	
4.3 Literary Studies, Religious Studies, Spanish, Swedish, Language	87.7	1.2	1.0	63%	0.0	13.0	32.9	38%	48.6	47.0	0.55	1.0	1.0	1%	0.0	0.0	-	-	0%	
5.1 Social Work	136.7	1.5	1.0	37%	2.0	11.5	52.7	39%	93.3	79.1	0.68	19.0	15.4	14%	20.5	16.5	1.0	0.8	8%	
5.2 Psychology	82.0	7.4	1.6	44%	10.2	2.0	63.2	77%	103.2	40.3	1.26	44.6	16.8	54%	276.2	134.5	4.8	2.7	31%	
5.3 Educational Science	277.1	2.0	1.1	31%	6.5	15.4	58.8	21%	80.0	50.1	0.29	6.0	3.9	2%	1.0	1.0	0.1	1.5	1%	
6.1 DEMICOM/Media and Communications Studies	327.2	1.9	1.4	61%	2.0	14.5	120.5	37%	200.1	149.9	0.61	31.0	21.2	9%	138.0	107.7	3.9	0.9	6%	
6.2 Quality Technology	50.8	2.2	1.0	65%	0.5	11.5	15.4	30%	14.3	12.5	0.28	5.7	5.7	11%	3.7	3.7	0.7	0.4	7%	
6.3 Information Systems	325.8	2.3	1.2	24%	10.8	6.4	106.8	33%	109.9	80.5	0.34	26.1	19.9	8%	18.8	14.0	0.7	0.9	3%	
7.1 Fibre Science and Communication Network	423.0	3.2	1.2	16%	67.1	12.5	236.5	56%	318.3	219.1	0.75	189.6	137.3	45%	898.1	550.0	3.9	2.2	31%	
7.2 Chemistry	96.4	4.7	1.3	33%	7.1	0.0	78.9	82%	125.4	63.6	1.30	69.7	37.0	72%	713.8	310.2	7.5	3.4	58%	
7.3 Chemical engineering	188.1	2.9	1.2	32%	43.7	2.0	92.5	49%	127.0	89.7	0.68	89.2	62.9	47%	493.9	284.9	4.6	1.5	36%	
7.4 Mathematics	99.8	2.2	1.3	41%	2.0	1.0	65.1	65%	85.9	63.6	0.86	44.7	35.0	45%	161.5	120.7	3.0	1.2	34%	
7.5 Sports Technology	59.4	3.2	1.1	39%	1.4	2.0	26.1	44%	26.9	21.6	0.45	19.1	16.4	32%	61.1	35.2	2.5	1.5	16%	
7.6 Engineering Physics	179.8	3.3	1.2	25%	22.4	0.0	114.4	64%	170.9	124.6	0.95	87.3	64.9	49%	521.2	242.8	0.5	1.9	35%	
8.1 Sensible Things That Communicates	407.5	3.5	1.2	14%	39.2	1.1	268.0	66%	247.1	196.6	0.61	158.5	128.2	39%	536.8	330.7	2.5	1.5	18%	
8.2 Computer Science	191.5	3.1	1.2	31%	15.3	2.1	108.4	57%	89.7	65.9	0.47	41.5	33.3	22%	48.7	37.1	1.2	1.1	5%	
8.3 Electronics	261.7	3.7	1.2	20%	28.9	1.7	177.4	68%	175.7	137.1	0.67	118.3	94.4	45%	383.8	268.9	2.3	1.5	23%	
9.1 Biology	113.5	3.1	1.4	41%	4.3	8.0	69.9	62%	96.4	54.2	0.85	58.1	34.7	51%	853.6	469.3	10.9	2.5	43%	
9.2 Ecotechnology and Environmental Science	201.9	3.2	1.3	53%	16.0	1.0	85.1	42%	128.2	93.0	0.63	72.1	57.5	36%	493.8	442.2	7.3	2.5	26%	
Faculty of Human Sciences (HUV)	2064.2	2.8	1.3	9%	114.5	108.4	998.2	48%	1306.4	784.1	0.63	460.8	236.7	22%	1815.5	865.8	3.5	1.8	16%	
Faculty of Nature, Media and Technique (NMT)	2130.8	3.4	1.2	8%	159.5	53.6	1070.3	50%	1365.8	975.9	0.64	695.2	510.0	33%	4222.5	2445.0	4.7	2.0	21%	
Mid Sweden University (MIUN)	4208.0	3.2	1.2	6%	271.0	164.0	2093.0	50%	2676.7	1762.5	0.64	1156.0	746.7	27%	6038.0	3310.7	4.3	1.9	18%	

