UNIVERSITY OF JYVÄSKYLÄ

University of Jyväskylä Research Evaluation Report 2018

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JYVÄSKYLÄN YLIOPISTO
UNIVERSITY OF JYVÄSKYLÄ

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FOREWORD

The Universities Act obliges Finnish universities to reach high international standards and evaluate their activities. Research evaluation is an integral part of quality assurance. It is a process for measuring research outcomes and it provides valuable information when setting future development goals. At its best, research evaluation helps strengthen the University's position in research and supports science renewal. The information provided by the evaluation process reveals the University's position in science and offers perspectives when searching for pathways to the future. Good knowledge about the current situation is essential when deciding upon concrete actions that aim to improve the scientific quality of research. This was the basic premise of the recently completed research evaluation process. The ultimate goal was to find ways to improve the preconditions for research instead of making conventional comparisons between different fields within the University. In this respect, the 2018 University of Jyväskylä research evaluation differs from the previous evaluations completed in 2005 and 2011, and it supplements the extensive review "the State of Scientific Research in Finland", reported biennially by the Academy of Finland, and other field-specific reports. The research evaluation process focusing on research development, albeit presenting critical observations, supports the strategy of the University by offering valuable inputs to the development programmes linked with the strategy. The report at hand not only supports internal development but is also important for communication with the large network of the University's stakeholders.

A university-wide research evaluation is a massive exercise and requires absolute commitment to the process from the entire University community. The evaluation would not have been possible without the positive attitude of the University's units towards the production of self-evaluation materials, organising the visit by the international evaluation panel and, at the end, producing development actions. I wish to thank all parties involved for your close and constructive cooperation. I would also like to thank all the members of the international evaluation panel: professors Sue Scott (chair), Marcel van Aken, Colin Boreham, Felicity A. Huntingford, Herman de Jong, Matthew K. O. Lee, Anne Pauwels and Marja-Liisa Riekkola. Using their extensive knowledge of the academic world, the panel examined our activities through the eyes of "critical friends" and highlighted a number of development areas for us to consider, in addition to acknowledging many positive features. I am extremely grateful for the strong commitment of the panel members to their demanding tasks.

Finally, I would like to thank Head of Research Development Timo Taskinen and Senior Planning Officer Anne Lyytinen, who were responsible for the practical implementation of the evaluation, and Information Specialist Marja Kokko for her role in producing bibliometric data. I would also like to thank Professor Kari Pitkänen, Director of Strategic Planning and Development, for his devotion to the project, all the way from the planning stage to the final report.

Jyväskylä, 16 April 2019
Henrik Kunttu
Vice Rector, Chair of the Science Council

AUTHORS' PREFACE AND ACKNOWLEDGEMENTS

This is the closing report of the third comprehensive research evaluation exercise, carried out at the University of Jyväskylä in 2018. The two previous evaluations, reported in 2005 and 2011, focused on evaluating the research performance of the disciplines of the University using independent international evaluation panels. The discipline-specific panels gave recommendations to the faculties and departments on how to improve their research performance and rated the quality of research using multiple criteria.

Research evaluation is an exercise performed regularly in most universities and there has been plenty of discussion on the basis and goals of such evaluations. The 2018 research evaluation at the University of Jyväskylä took a different approach than the two previous evaluation exercises. The process focused on supporting each academic unit of the University to recognise the strengths and weaknesses in their research environment so that they could define the most urgent and relevant measures needed to enable improvements in the existing environment, and subsequently, reach their full potential in scientific research. An essential starting point was a critical self-evaluation conducted by the units, based on which they were requested to draft the units' research development plan. The presupposition was that the units engage academics from all research career stages in the process to ensure multivoiced views on research development. An eight-person international evaluation panel was invited to give feedback to the units on their development plans.

The 2018 research evaluation report describes the different stages of the evaluation process and lists the staff that participated in the self-evaluation exercise in the units or were interviewed by the peer evaluation panel during the panel's site visit in September 2018. The report also contains a review of the University's accomplishments as an academic research institution during the evaluation period 2010–2017. To the extent that data were available, comparisons have been made with the previous evaluation period 2005–2009. The 2018 research evaluation report also contains in full the international evaluation panel's report, submitted to the University in November 2018. The units' self-evaluations are not included in this report but an outline of the major focal points in these assessments have been given. The units' research development plans will be published separately for internal use but this report contains a summary of the intended development actions.

Numerous people have contributed to the research evaluation process and to the preparation of this report in manifold ways. We are very grateful to many individuals and units at JYU for facilitating our work.

We are greatly indebted to the Uppsala University Q&R17 project secretariat, in particular Dr. Åsa Kettis, for their valuable input on the planning stage of the 2018 research evaluation process. The Uppsala University Research Environment Evaluation (Forskningsutvärderingen Kvalitet of Förnyelse 2017), abbreviated as Q&R17, was completed during the planning stage of the 2018 JYU research evaluation exercise. Q&R17 aimed to strengthen research at Uppsala University through a broad

analysis of the functioning of its various research environments, focusing particularly on the preconditions and processes that underpin research quality and renewal. The research evaluation team at JYU discussed extensively the goals, key questions, self-evaluations and practices of a research evaluation with the Q&R17 project secretariat. We are also grateful that the secretariat gave us their permission to use their self-assessment template as the basis for our own template.

The research evaluation team also wishes to thank the members of the University of Jyväskylä Science Council for their support during the process. We specifically wish to acknowledge the important role of the council's chairperson, Vice Rector Henrik Kunttu. His continuous support has been of great importance to us.

The 2018 Research evaluation team also wishes to thank all the members of the international evaluation panel for their devoted cooperation during the evaluation process, and in particular, for their endurance during the extremely intensive five-day site visit at the University.

Special thanks go to Information Specialist Dr. Marja Kokko, who provided the evaluation units and the international evaluation panel with extensive bibliometric data and gave us invaluable support during the preparation of this report.

Finally, we wish to thank Head of Internationalization & Higher Education Policy Anna Grönlund for her qualified assistance in writing the section on university rankings.

Jyväskylä, 16 April, 2019

Anne Lyytinen
Kari Pitkänen
Timo Taskinen

Contents

1 INTRODUCTION

The University of Jyväskylä (JYU) has previously carried out organisation-wide research evaluations twice, the first in 2005 and the second in 2010–2011. Both of these exercises were conducted as peer evaluations assessing the quality of the research activities in the years 2000–2004 and 2005–2009, respectively. An external international evaluation panel had been appointed for every faculty of JYU. In 2010–2011, the panels rated the quality of research on five quality dimensions in each evaluation unit (mostly departments) using a 5-point scale: Scientific Quality of the Unit's Research, Quality of the Scientific Impact, Quality of Research Collaborations, Quality and Quantity of the Research Funding, Quality of the Research Environment. Even though the panels made recommendations on how to improve the Units' quality of research, the main purpose of both of the previous research evaluations was to identify the strong research areas within the University.

The third research evaluation at JYU, conducted in 2018, took a different approach. The main purpose of the research evaluation exercise was to give support to all the units of JYU on how to identify which actions are needed so that the units can reach their full potential in scientific research. The evaluation aimed at analysing the current functioning of the various dimensions linked to the University's and its units' research environment and defining measures which must be taken to enable improvements in the existing research environments, and consequently, enhance the quality of the research. The intention of the evaluation exercise was not to result in any sort of grading of the units' research performance. The key questions were as follows:

1) Does the University of Jyväskylä provide good preconditions for high-quality research?
2) What could the evaluation units and/or the University do to further develop their research environment?

The evaluation process consisted of four main elements: 1) Provision of University- and unit-level background data for the evaluation period 2010–2017, mostly in the form of bibliometric analyses, 2) Units' self-evaluations, 3) Units' plans for the development of their research environment, 4) An external peer evaluation conducted by an international panel. In the self-evaluation reports, each of the 11 evaluation units described, from their own perspective, the current functioning of their research environment, identifying both strengths and weaknesses. The evaluation was not intended to focus on doctoral training because it was evaluated separately in 2016 (see 3.4).

The units' development plans were subjected to external peer review. JYU had asked eight distinguished scholars, most of them from outside Finland, to serve as "critical friends" and give feedback to the units on the feasibility and the "fitness for purpose" of their development plans. The key questions posed to the panel were the following:

1) Are the proposed actions well defined and do they have a clear objective?
2) Is the choice of proposed actions justifiable in the light of the background data?
3) Are the proposed actions likely to lead to the target?

The panel members also visited the units and interviewed a selection of their research staff as well as the leadership of the units and of the University. After the site visit, the panel members compiled a report, in which they presented their observations and made recommendations to each evaluation unit. The panel was asked to evaluate the units as a whole, but the panel was also allowed to make remarks on individual departments, when and if appropriate. The panel also made many recommendations, which in fact, were general recommendations to the University. After having received the panel report, the evaluation units finalised their development plans, reflecting the conclusions and recommendations presented by the panel. Furthermore, the Science Council, which acted as the steering group of the entire evaluation exercise, reflected on the university-wide recommendations made by the panel, identifying the most critical and urgent actions to be included in the Research Development Action Plan *Tutkija keskiössä* (Focusing on researcher success). This plan has recently been approved by the JYU University Board as part of the new overall strategy of the University. Both the peer panel report and summaries of the University's and the units' development plans are included in this report.

2 THEORETICAL CONSIDERATIONS IN DEVELOPING THE RESEARCH ENVIRONMENT

Each of the 11 evaluation units of JYU were requested to carry out a self-evaluation using a template that was divided into 11 pre-defined topics (Appendix 1). The units were given the freedom to choose the topics which they considered as being the most relevant to focus on. From a theoretical perspective, five factors related to the research environment, all intertwined, appear to be of great importance in enhancing research quality and impact. These factors are recruitment, career development and mobility, research collaboration, funding, and leadership.

As both the competence of researchers and, in many fields, also the group size contribute to good research performance, successful recruitment plays a fundamental role when an organisation is aiming for high-quality research or renewal (Economic Insight 2014, Manville et al. 2015). It is challenging to attract good researchers and a good reputation is an indispensable asset for the organisation. In addition, a variety of other assets can help the organisation to stand out from the rest, such as sophisticated research infrastructure, good salary and fringe benefits, a period of low teaching load, and a supportive culture (Manville et al. 2015).

When the organisation has recruited the best possible research staff, it should be able to avoid excessive turnover of its professionals. One way to retain good researchers is to recognise their success by using incentives, such as promotions, financial rewards, and teaching-free periods (Manville et al. 2015). Furthermore, in order to thrive, an institute should provide favourable working conditions and atmosphere. For example, supportive leadership, research-valuing attitude, the amount of time to undertake research, respectful relationships, and belongingness have been associated with successful research environments (reviewed by Ajjawi et al. 2018). Academic culture and leadership characteristics are essential for both research productivity (Bland et al. 2005) and quality (Manville et al. 2015).

Another crucial factor is research collaboration, which is motivated, for example, by the need to get access to complementary skills, knowledge, facilities, and infrastructure (Melin 2000, Royal Society 2011). Collaboration is beneficial in many ways. It can increase scientific impact as measured by the number of citations (Royal Society 2011, Adams 2013, Nuutinen et al. 2016, Auranen et al. 2018), publishing productivity in terms of the number of publications (Lee & Bozeman 2005), and the chances for obtaining research funding (Ebadi & Schiffauerova 2015). Some research findings indicate that particularly multidisciplinary collaboration as well as international collaboration may increase funding prospects (Bellotti et al. 2016, Sugimoto et al. 2017). In addition, national mobility appears to have science-boosting effects (Halevi et al. 2016).

Funding is a crucial enabler for research productivity, successful recruitment, collaboration, and mobility. Hence, it is not surprising that there is a positive association between the amount of funding and the number of papers produced by a researcher (Ebadi & Schiffauerova 2015). In general, without skilful and innovative

researchers there is no cutting-edge science. Furthermore, even though there are several examples showing that researchers working on their own or in very small groups can produce excellent research, there are findings indicating that a viable scientific community benefits from having a certain critical mass. Mathematical models have found a relationship between the number of academics in research groups and research quality (Kenna & Berche 2011, 2012), although the models also indicate that the positive dependence of research quality on group size levels off after a certain threshold. This is likely due to reaching a limit to the number of interactions an individual can maintain. The significance of critical mass, however, varies greatly by discipline, acknowledging the different ways of delivering high quality research. Small group size can also be compensated for by collaboration across disciplines, institutions and countries.

The above overview shows that the environmental factors of research not only directly affect research quality but also interact with each other. This and the differences in characteristics and practices between disciplines stress the complexity of creating conditions promoting research of high quality, and thus enhance the role of skilful and visionary leadership.

3 RESEARCH AT THE UNIVERSITY OF JYVÄSKYLÄ

3.1. Basic facts about the University of Jyväskylä

The University of Jyväskylä (JYU) was founded in 1863 when Finnish-language teacher education began with 16 employees and 49 students in the small township of Jyväskylä. Currently, Jyväskylä is a vibrant city with 140,000 inhabitants and the University enrols about 14,500 students and awards approximately 2,800 degrees yearly. JYU currently has about 2,500 employees, or 2,400 full-time equivalent employee hours (FTE), of which about 1,400 FTEs are research personnel (Figs. 1, 2; Table 1).

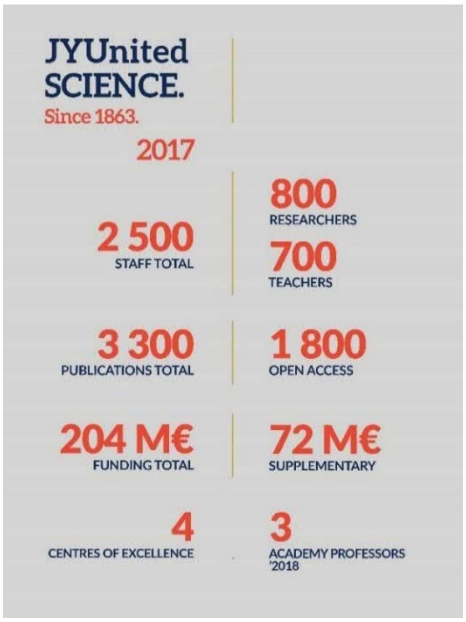

Figure 1. The JYU in figures (all units included).

The University is organised into six faculties, each with a dean who heads the faculty. Three faculties consist of departments, which are led by the head of department. In addition to the faculties, the University has five independent institutes, two of which also have research personnel: Kokkola University Consortium Chydenius and the Finnish Institute for Educational Research (Fig. 3).

As a public university, JYU has a University Collegium that has 30 members representing the university community, that is, the three personnel groups (professors, research and teaching staff, other personnel) and the students. The Collegium elects those University Board members who do not represent the university community and confirms the elections of the University Board members by the university community. The seven-member University Board is the highest decision-making body in the University. For example, the Board elects the Rector and approves the University's strategy (Fig. 3).

Table 1. Funding and the number of degrees, University of Jyväskylä, 2010–2017. (Funding: SAP financial accounting system; Degrees: Vipunen Reporting Portal, accessed on 2 Sept. 2018)

	2010	2011	2012	2013	2014	2015	2016	2017
Funding								
Total funding (M€)	204	210	217	215	213	220	207	204
External funding (%)	32	35	34	34	32	30	32	35
Type of degree								
Bachelor	1,219	1,169	1,193	1,187	1,213	1,261	1,211	1,344
Master	1,239	1,336	1,371	1,487	1,452	1,486	1,516	1,475
Doctoral	140	162	168	160	158	160	158	148

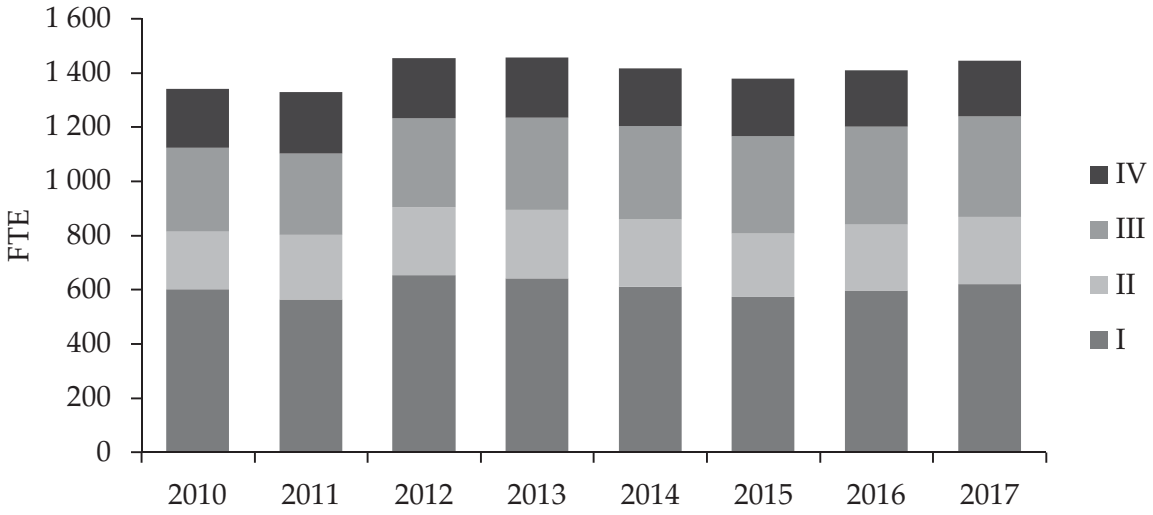

Figure 2. Number of research personnel at JYU, employees, full-time equivalent (FTE), 2010–2017. Sources: Vipunen Reporting Portal (accessed in April, 2018). Notes: The research personnel are classified on the basis of a four-stage career model. The first stage consists of doctoral students and project researchers, the second stage of postdoctoral researchers and other researchers who have recently completed their doctorate, the third stage of associate (tenure track) professors, senior lecturers, and senior researchers, and the fourth stage of professors.

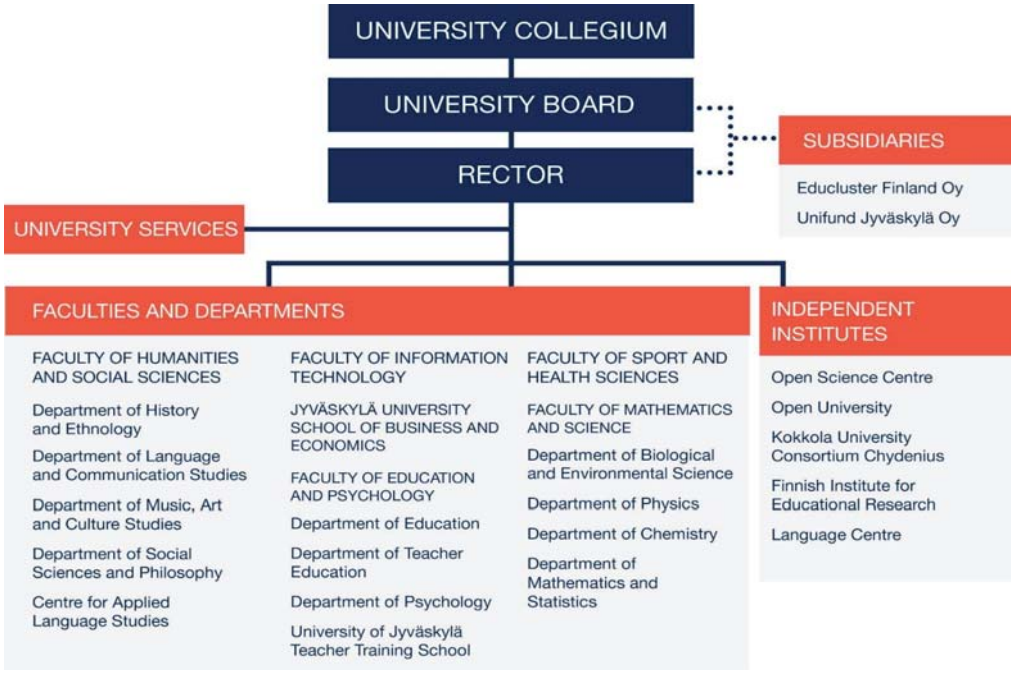

Figure 3. The University of Jyväskylä's organisation since 2017.

When looking at the data presented in Table 2, it is clear that the faculty size varies notably at JYU. The largest faculty, Mathematics and Science has research and teaching personnel of about 400 FTEs, whereas the smallest faculty, the Jyväskylä University School of Business and Economics has less than 100 FTEs. The former faculty's position as the largest academic unit is due to its strong research orientation. The faculty has almost twice as many researchers as teachers, and the share of external, supplementary (mostly research) funding to the total funding has for a long time been above the faculty average, 41.5% in 2017. All JYU faculties are active in research but there are distinct differences in their profile. Two of the faculties, Education and Psychology and the Jyväskylä University School of Business and Economics, have more teachers than researchers, and in 2017, the share of supplementary funding to total funding (32%) was clearly below the faculty average (38%).

JYU is an increasingly international community and the share of international personnel to the total personnel has been growing. The share of the international research personnel to the total research personnel has increased by 7 percentage points from 2010 to 2017 (Fig. 4). Most of the change is due to the increasing numbers of international doctoral students (those having an employment contract, career stage 1) and postdoctoral researchers (career stage 2). A similar trend can be seen in all Finnish universities (Auranen et al. 2018).

Table 2. Key figures for JYU faculties and research-active independent institutes in 2017. (Personnel: JYU Personnel database; doctoral students: JYU student registry; publications: TUTKA Research Portal; funding: JYU finance reporting system)

	Researchers		Teachers		Doctoral	Publications	Funding (M€)	
	NoE	FTE	NoE	FTE	students[1]		Core	Supplementary
Faculty								
Humanities and Social Sciences	222	190.0	179	146.6	628	1,020	19.0	10.8
Sport and Health Sciences	96	72.0	61	57.8	139	425	10.3	4.8
Education and Psychology	120	106.2	138	122.3	287	492	13.9	6.4
Information Technology	127	84.4	62	58.2	178	280	8.9	8.4
JYU School of Business and Economics	44	32.7	55	46.3	163	199	7.1	3.3
Mathematics and Science	312	282.9	119	113.2	250	839	25.8	18.3
Independent Institute								
Kokkola University Consortium	23	21.5	24	25.5	23	50	2.9	4.1
Finnish Institute for Educational Research	39	30.2	5	5.5	0	109	2.6	3.1
Tot.	983	819.8	643	575.4	1,668	3,414	90.5	59.3

Notes: NoE = Number of employees, FTE= Full time equivalent employee hours, [1] Only doctoral students registered for attendance

Traditionally, men have outnumbered women in most university positions, but the ratio has been changing over the past decades. Today, women account for a clear minority of the JYU research personnel only at career level 4 (Fig. 5). The share of women, however, varies greatly by faculty. For example, in 2017 the share of women ranged from 10% (Faculty of Information Technology, career stage 4) to 72% (Faculty of Education and Psychology, career stage 3). From 2010 to 2017, the gender balance has slightly improved. The trend appears to be about the same as the average in Finnish universities (Auranen et al. 2018).

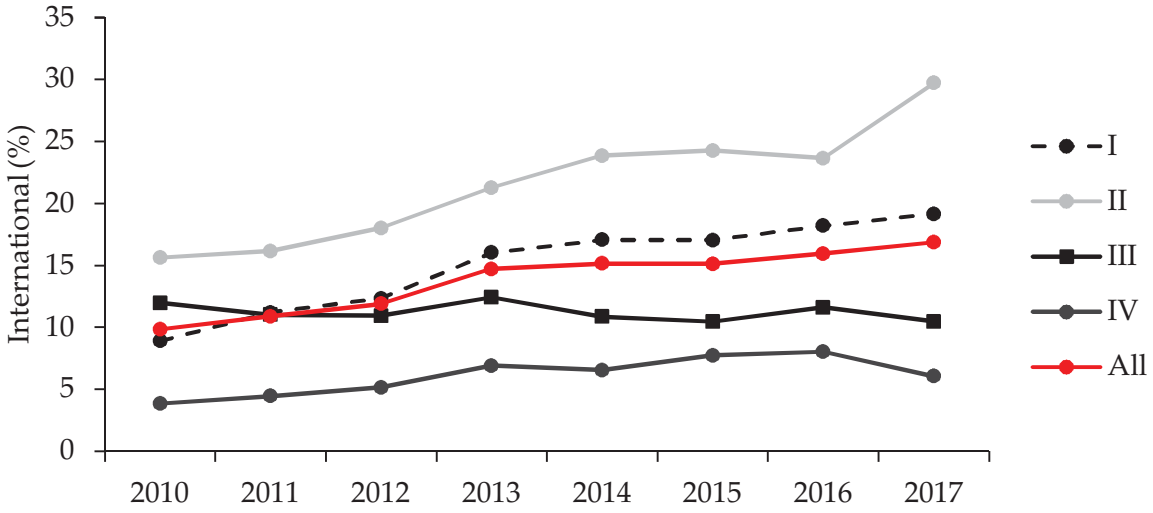

Figure 4. The share of international personnel (FTE), research career stages 1–4. Notes: The red line shows the share of international personnel to all research personnel. Source: Vipunen Reporting Portal (accessed in April 2018).

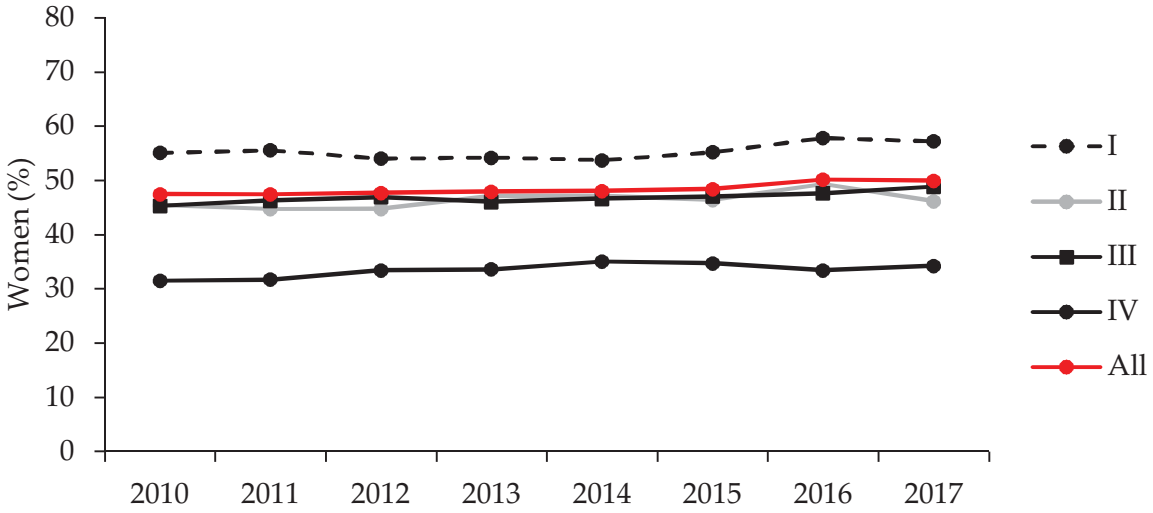

Figure 5. The share of women, research career stages 1–4 (FTE). Note: The red line indicates the share of women (FTE) to all research personnel. Source: Vipunen Reporting Portal (accessed in April 2018).

3.2. Data on research at the University of Jyväskylä

3.2.1. Core fields in research and strategic profiling

The University of Jyväskylä launched a new strategy in 2014, its first strategy after the 2010–2011 research evaluation. The strategy states that the mission of JYU is "to conduct significant, world-class research in its core fields and to train competent, motivated experts who possess lifelong learning skills in various fields" (University of Jyväskylä 2014).

Building upon the assessments published in the research evaluation report, the strategy defined five core fields in research:

- learning, teaching and the learning and growth environments that support development
- basic natural phenomena and mathematical thinking
- languages, culture and communities in global change processes
- physical activity, health and wellbeing
- information technology and the human in the knowledge society

Starting in 2015, the Finnish Government has transferred 50 million euros annually from the universities' core budget to the Academy of Finland to be targeted to Finnish universities to strengthen their research profiles. Once a year (twice in 2015), universities have been invited to apply for funding with concrete plans for strengthening their strategic research fields, each university submitting its own application.

JYU has submitted four profiling applications between 2015 and 2017, each time applying for funding for three profiling areas. (The Academy of Finland has defined that "a 'profiling area' is a research area that a university aims to develop according to its strategy".) All the JYU profiling areas are closely linked with the core fields, and most of the profiling areas are cross-disciplinary. For two profiling areas, JYU has already applied for funding twice (see Fig. 6). All of the JYU profiling applications have received funding, totalling about 18 million euros.

The profiling funding has been used to recruit talented researchers in the profiling areas, often in tenure track positions. The main purpose of the profiling funding is to help the universities speed up their strategic profiling actions. Researchers can be recruited before the necessary funds could be allocated for this purpose using the University's core funding. However, after the funding period, JYU is expected to maintain the increased financial volume of the profiling areas using its core funding.

Starting in January 2017, JYU implemented a new structure of faculties and departments. The purpose of the new arrangements was to support the profiling actions by removing administrative barriers that could hinder collaboration between research groups and rational use of resources. The Faculty of Social Sciences and its two departments, the Department of Psychology and the Department of Social Sciences and Philosophy, was abolished. The Department of Psychology was merged with the Faculty of Education, thus creating the Faculty of Education and Psychology.

The Department of Social Sciences and Philosophy, in turn, was merged with the Faculty of Humanities, thus creating the Faculty of Humanities and Social Sciences. Simultaneously, the number of departments in the latter faculty decreased from seven to five due to restructuring.

At the same time, the administrative division into departments was abolished in two faculties, the Faculty of Sport and Health Sciences and the Faculty of Information Technology. A similar restructuring had already previously been implemented in the Jyväskylä University School of Business and Economics.

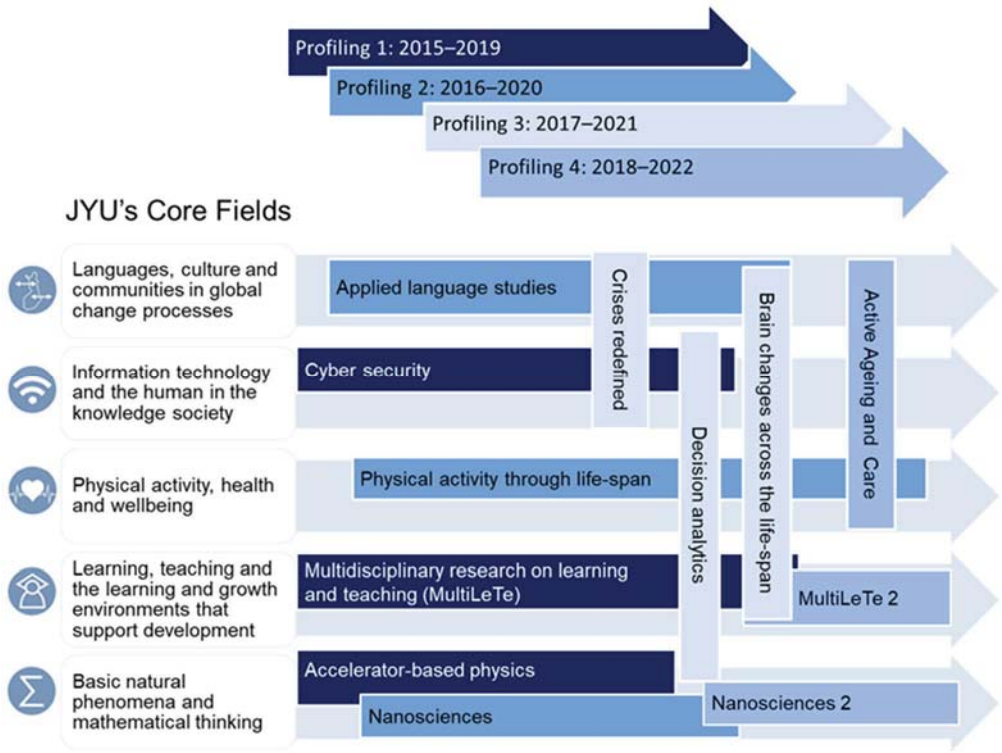

Figure 6. JYU's core research fields and profiling areas in the first four profiling application rounds.

3.2.2. Competitive research funding

Sufficient external funding is one of the enablers of conducting high-quality research. Yet obtaining research funding can also be regarded as an indicator of research already being of high quality (Ebadi & Schiffauerova 2015). At the University of Jyväskylä, external funding (not all competitive) constitutes one third of the total funding (Table 1). Research is also supported by core funding, which the Ministry of Education and Culture allocates to the Universities using a financing model largely based on performance in education and research. As is the case for all Finnish universities, the single largest external funding agencies are the Academy of Finland and Tekes (Business Finland[1]) (Auranen et al. 2018). In 2017, funding from these two agencies accounted for 69% of JYU's total external funding, being the highest among all research universities in Finland (Auranen et al. 2018). In 2012–2014, JYU's share of the total research funding to the Finnish universities from the Academy of Finland, Tekes (Business Finland), and EU Framework Programmes was 8% (Nuutinen et al. 2016).

Table 3 shows the use of external research funding received from the three funding sources mentioned above by faculty and department, comparing three periods. For most units the foremost funding agency has been the Academy of Finland. Tekes has been of minor importance for most of the units, the most notable exceptions being the JYU School of Business and Economics, the Faculty of Mathematics and Science, and particularly, the Faculty of Information Technology. In general, EU funding has been of greater significance than Tekes funding for most of the JYU units. It should be noted, though, that EU funding contains funding from all EU programmes, not just ERC and EU Framework Programmes for Research, because the data available do not permit programme-specific analyses for the entire period from 2005 to 2017. In the late 2000s, ERC and EU Framework Programme funding accounted for less than one third of the total EU funding, and in most units the lion's share of all EU funding was received from the structural funds. In recent years, the shares of these EU funding programmes have more or less been reversed. Both the volume and the proportion of ERC and EU Framework Programme funding has more than doubled and the role of structural funds has considerably diminished.

JYU, its research groups and researchers have been rather successful in obtaining funding from the most prestigious national and European funding sources. These are the Academy of Finland's Centres of Excellence (CoE) programme, Academy Professor posts from the Academy of Finland, European Research Council (ERC) grants, and the Finland Distinguished Professor Programme (FiDiPro), a joint programme funded by the Academy of Finland and Tekes (Business Finland).

[1]Business Finland was created as the result of a merger between Finpro (the Finnish trade promotion organisation) and Tekes (the Finnish Funding Agency for Innovation) in 2018. For some universities, particularly for technical universities, Tekes used to be even more important as a funding source than the Academy of Finland.

Table 3. Annual use of external competitive research funding from the Academy of Finland, Tekes, and EU, by unit, 2005–2017. (JYU/SAP financial accounting systems)

	Annual average, in thousand Euros		
Faculty or Department	2005–2009	2010–2013	2014–2017
FACULTY OF HUMANITIES AND SOCIAL SCIENCES			
Academy of Finland	3,532	5,570	5,931
Tekes	127	163	346
EU Funding	412	83	679
Department of Social Sciences and Philosophy			
Academy of Finland	1,826	2,042	2,303
Tekes	21	74	95
EU Funding	110	38	396
Department of History and Ethnology			
Academy of Finland	587	1,234	1,387
Tekes	84	0	0
EU Funding	14	26	1
Department of Music, Art and Culture Studies			
Academy of Finland	515	1,066	1,158
Tekes	0	14	242
EU Funding	202	8	179
Department of Language and Communication Studies			
Academy of Finland	552	796	929
Tekes	22	75	8
EU Funding	60	11	45
Centre for Applied Language Studies			
Academy of Finland	52	431	155
Tekes	0	0	0
EU Funding	25	0	58
FACULTY OF SPORT AND HEALTH SCIENCES			
Academy of Finland	406	986	1,204
Tekes	371	457	305
Ministry of Education and Culture (*)	1,104	1,287	1,130
EU Funding	729	787	710
FACULTY OF EDUCATION AND PSYCHOLOGY			
Academy of Finland	1,097	1,972	2,676
Tekes	27	106	70
EU Funding	163	482	654
Department of Education			
Academy of Finland	283	478	560
Tekes	0	0	0
EU Funding	18	33	70
Department of Teacher Education			
Academy of Finland	48	168	484
Tekes	0	0	0
EU Funding	140	449	203

Table 3. (continues)

Faculty or Department	Annual average, in thousand Euros 2005–2009	2010–2013	2014–2017
Department of Psychology			
Academy of Finland	766	1,326	1,632
Tekes	27	106	70
EU Funding	5	0	381
FACULTY OF INFORMATION TEHCHNOLOGY			
Academy of Finland	375	787	1,000
Tekes	1,002	3,544	2,980
EU Funding	338	520	276
JYU SCHOOL OF BUSINESS AND ECONOMICS			
Academy of Finland	223	227	556
Tekes	193	478	236
EU Funding	202	43	37
FACULTY OF MATHEMATICS AND SCIENCE			
Academy of Finland	6,084	11,620	13,397
Tekes	888	709	575
EU Funding	1,779	409	1,638
Department of the Mathematics and Statistics			
Academy of Finland	591	1,607	1,991
Tekes	58	0	0
EU Funding	20	0	276
Department of Physics			
Academy of Finland	1,778	3,050	3,777
Tekes	371	182	83
EU Funding	1,057	223	835
Department of Chemistry			
Academy of Finland	931	2,108	2,683
Tekes	296	320	161
EU Funding	285	34	79
Biological and Environmental Science			
Academy of Finland	2,784	4,855	4,945
Tekes	163	206	331
EU Funding	417	152	448
INDEPENDENT INSTITUTES			
Finnish Institute for Educational Research			
Academy of Finland	415	484	243
Tekes	0	55	0
EU Funding	159	333	261
Kokkola University Consortium Chydenius			
Academy of Finland	2	112	109
Tekes	12	36	22
EU Funding	1,152	1,036	1,095

The division into faculties and departments follows the administrative structure introduced in 2017. Due to changing registration practices, the figures for the first period (2005–2009) are not strictly comparable with the latter periods, but the figures show the general trends and differences.

(*) The Ministry of Education and Culture allocates annually specific research funding for research in sport and fitness sciences and is one of the most significant research funders for the Faculty of Sport and Health Sciences.

The Centres of Excellence (CoE) programme provides funding for six years for research which is at the very cutting edge of science in its field. During the period from 2010 to 2017, JYU has been either coordinating or has been a partner institution in 15 CoEs (Table 4). In addition, three new CoEs were launched in 2018, JYU being the coordinator in one and one of the partners in two CoEs. Figure 7 shows how successful Finnish universities have been in obtaining funding from the CoE programme. Without question, the University of Helsinki has been the most successful university, but JYU is among the few universities which are in the second best group.

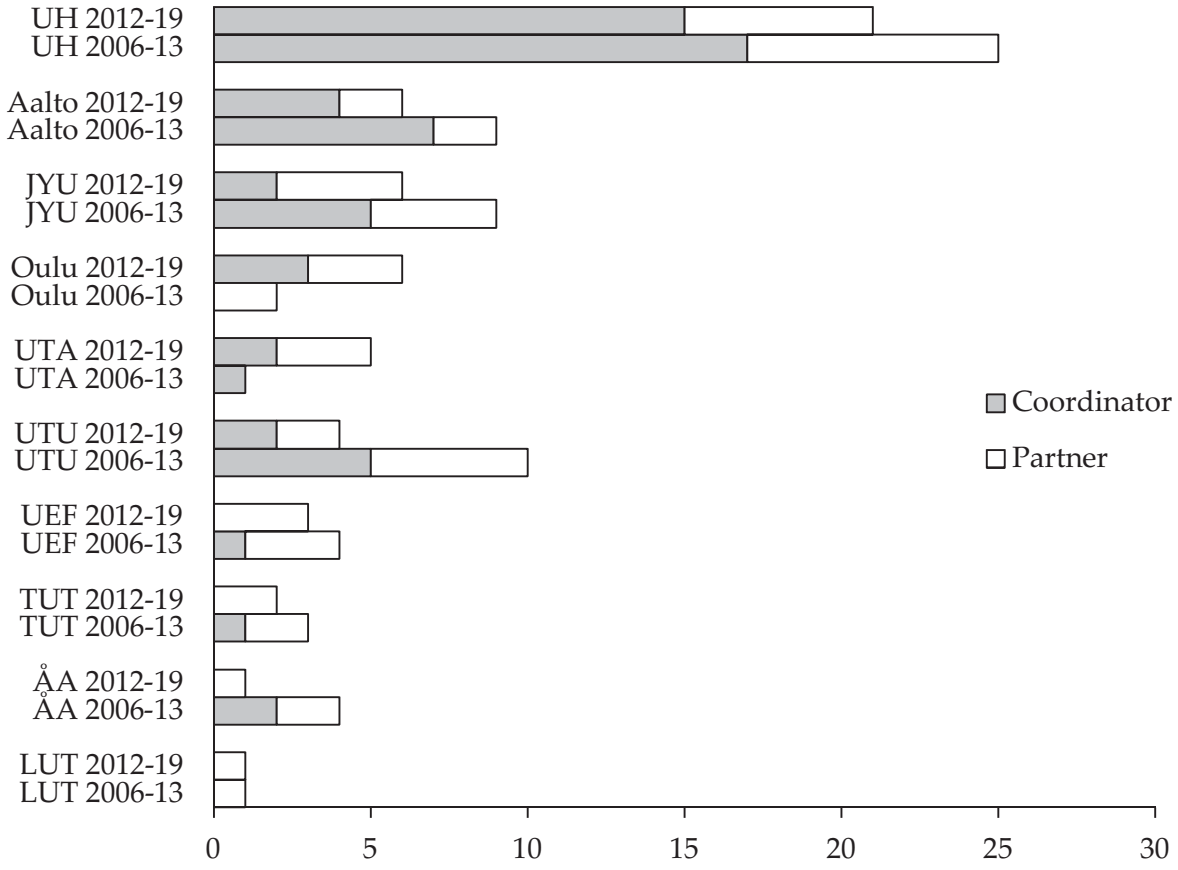

Figure 7. The number of Centres of Excellence in Finnish universities. The years refer to the funding period. Abbreviations: Aalto = Aalto University, JYU = University of Jyväskylä, LUT = Lappeenranta University of Technology, Oulu = University of Oulu, TUT = Tampere University of Technology, UEF = University of Eastern Finland, UH = University of Helsinki, UTA = University of Tampere, UTU = University of Turku, ÅA = Åbo Akademi University. Source: Academy of Finland 2007, 2009, 2018.

Table 4. The Centres of Excellences (CoEs) in which JYU has been either the coordinator or a partner, 2010–2017.

Period, CoE	Partners	Department at JYU	Head of the CoE
2006–2011			
Evolutionary Research	JYU	Biological and Environmental Science	Rauno Alatalo / Anneli Hoikkala (JYU)
Learning and Motivation Research	JYU, UEF, UTU	Psychology	Jari-Erik Nurmi (JYU)
Nuclear and Accelerator Based Physics	JYU	Physics	Rauno Julin (JYU)
Political Thought and Conceptual Change	JYU	Social Sciences and Philosophy	Kari Palonen (JYU)
The Study of Variation, Contacts and Change in English	UH, JYU	Languages	Terttu Nevalainen (UH)
Virus Research	UH, JYU	Biological and Environmental Science	Dennis Bamford (UH)
2008–2013			
Interdisciplinary Music Research	JYU, UH	Music	Petri Toiviainen (JYU)
Philosophical Psychology, Morality and Politics	UH, JYU	History and Ethology, Social Sciences and Philosophy	Simo Knuuttila (UH)
Analysis and Dynamics Research	UH, JYU		Antti Kupiainen (UH)
2012–2017			
Biological Interactions	JYU, UH, ANU/UZH	Biological and Environmental Science	Johanna Mappes (JYU)
The History of a Society: Re-thinking Finland 1400–2000	UTA, JYU, ÅA	History and Ethology	Pertti Haapala (UTA)
Inverse Problems Research	UH, JYU, Oulu, UEF, TUT, LUT	Mathematics and Statistics	Matti Lassas (UH)
Low Temperature Quantum Phenomena and Devices	Aalto, VTT, JYU	Physics	Jukka Pekola (Aalto)
Nuclear and Accelerator-Based Physics	JYU	Physics	Rauno Julin (JYU)
2014–2019			
Analysis and Dynamics Research	JYU, UH, Oulu	Mathematics and Statistics	Antti Kupiainen (UH)

Abbreviations: Aalto = Aalto University, ANU = Australian National University, LUT = Lappeenranta University of Technology, Oulu = University of Oulu, TUT = Tampere University of Technology, UEF = University of Eastern Finland, UH = University of Helsinki, UTA = University of Tampere, UTU = University of Turku, UZH = University of Zurich, VTT = Technical Research Centre of Finland LTD, ÅA= Åbo Akademi University.

The Academy of Finland grants research posts as Academy Professor for applicants, who are "internationally leading-edge researchers and recognised experts in their field who are expected to have great scientific impact in the scientific community and in society at large". These posts are much sought-after because they enable full-time research work, albeit fixed-term, to professors who carry out their own research plan. The Academy of Finland has funded four posts as Academy Professors for researchers hosted by JYU, based on the calls from 2005 to 2009. Only the University of Helsinki fared better in competition than did JYU (Fig. 8). In 2010–2017, the Academy of Finland funded five posts for researchers hosted by JYU (Table 5). Relatively speaking, this was a modest increase, since many other universities managed to increase their share of the Academy Professor posts to a much greater extent (Fig. 8).

Table 5. Academy Professors funded by the Academy of Finland in 2010–2017, hosted by the University of Jyväskylä.

Academy Professor	Host organisation at JYU	Funding period
Sara Heinämaa	Dept. of Social Sciences and Philosophy	2017–2021
Hannu Häkkinen	Dept. of Chemistry and Dept. of Physics	2016–2020
Kari Rissanen	Dept. of Chemistry	2013–2017
Juha Sihvola	Dept. of History and Ethnology	2012–2016
Petri Toiviainen	Dept. of Music, Arts and Cultural Studies	2014–2018

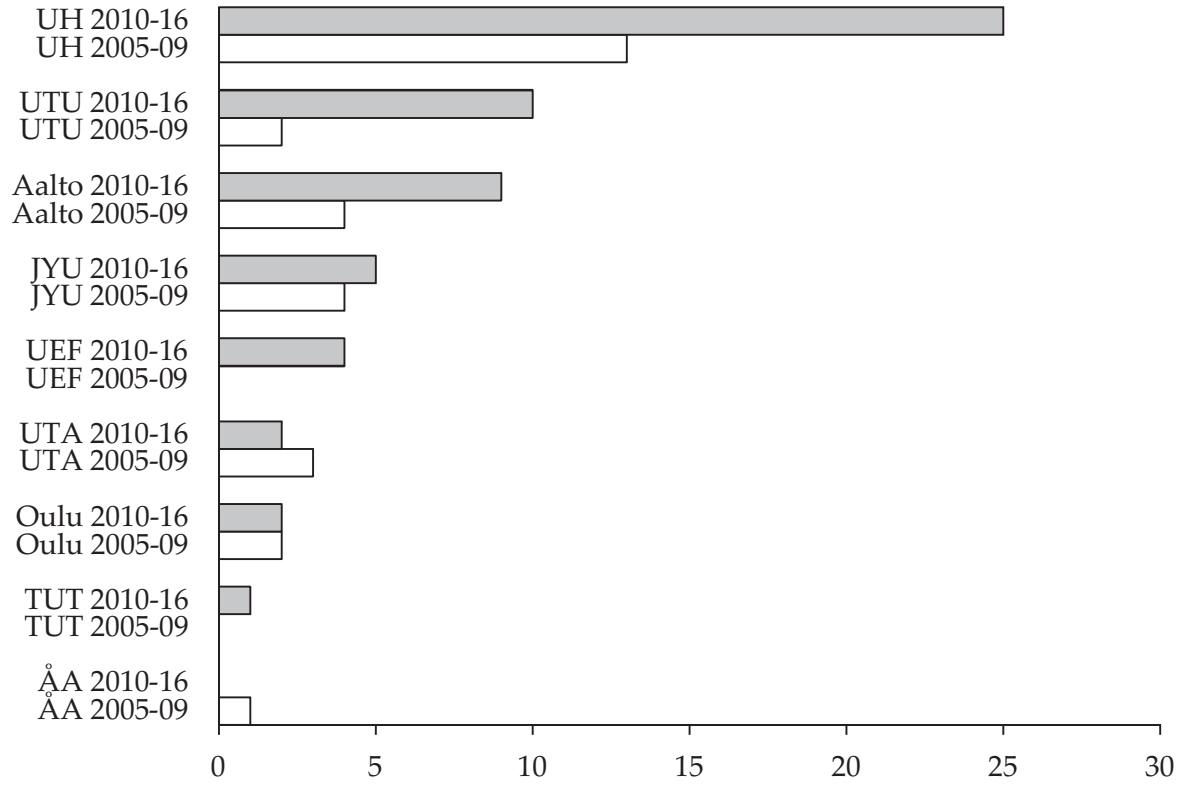

Figure 8. The number of Academy Professors at Finnish universities. The years refer to the call year. Abbreviations: Aalto = Aalto University, JYU = University of Jyväskylä, Oulu = University of Oulu, TUT = Tampere University of Technology, UEF = University of Eastern Finland, UH = University of Helsinki, UTA = University of Tampere, UTU = University of Turku, ÅA= Åbo Akademi University. Sources: Academy of Finland 2007, 2009, 2019.

The Academy of Finland, jointly with Tekes (Business Finland), also funds the Finland Distinguished Professor Programme (FiDiPro), which enables universities to hire international top researchers to work in Finland. In 2010–2017, JYU has been awarded eight FiDiPro Professorships (Table 6). The success indicates that JYU is able to attract high-profile international researchers to conduct research at the University.

Along with the Academy of Finland grants, the European Research Council (ERC) offers lucrative, high-profile grants to researchers at different career stages: Starting Grants for early-career researchers, Consolidator Grants for researchers who want to consolidate their independence by establishing a research team, and Advanced Grants for established researchers who are already "leading principal investigators". The competition for these grants is rigorous, and a successful outcome can be regarded as a yardstick for research excellence. In 2010–2017, the ERC has awarded an ERC grant to seven JYU researchers (Table 7). During the research evaluation period, JYU researchers have fared well in comparison with other Finnish universities (Fig. 9).

Table 6. The Finland Distinguished Professors (FiDiPro) at the University of Jyväskylä, funding decisions made in 2010–2017.

FiDiPro	Home organisation	Host organisation at JYU	Period
Holland Cheng	University of California, Molecular and Cellular Biology, USA	Department of Biological and Environmental Science	2012–2016
Keith Davids	Queensland University of Technology, Brisbane, Australia	Faculty of Sports and Health Sciences	2012–2016
Jacek Dobaczewski	Institute of Theoretical Physics, University of Warsaw, Poland	Department of Physics	2007–2011, 2012–2017
Nicola Fusco	University of Napoli, Italy & The Carnegie Mellon University, USA	Department of Mathematics and Statistics	2012–2016
Martin Hagger	School of Psychology and Speech Pathology, Curtin University, Perth, Australia	Department of Sport Sciences	2016–2019
Yaochu Jin	University of Surrey, UK	Faculty of Information Technology	2015–2017
Niilo Kauppi	French National Centre for Scientific Research (CNRS) and University of Strasbourg, France	Department of Social Sciences and Philosophy	2015–2019
Asoke K. Nandi	University of Liverpool, UK	Department of Mathematical Information Technology	2010–2014

Table 7. Researchers funded by European Research Council (ERC) at the University of Jyväskylä in years 2010–2017.

Recipient	ERC grant	Department	Period
Enrico Le Donne	Starting Grant	Mathematics and Statistics	2017–2022
Jari Kaukua	Consolidator Grant	Social Sciences and Philosophy	2016–2021
Tuomas Lappi	Consolidator Grant	Physics	2016–2021
Tuuli Lähdesmäki	Starting Grant	Music, Art and Culture Studies	2015–2020
Taina Rantanen	Advanced Grant	Faculty of Sport and Health Sciences	2017–2022
Mikko Salo	Starting Grant	Mathematics and Statistics	2012–2017
Marja Tiirola	Consolidator Grant	Biological and Environmental Science	2014–2019

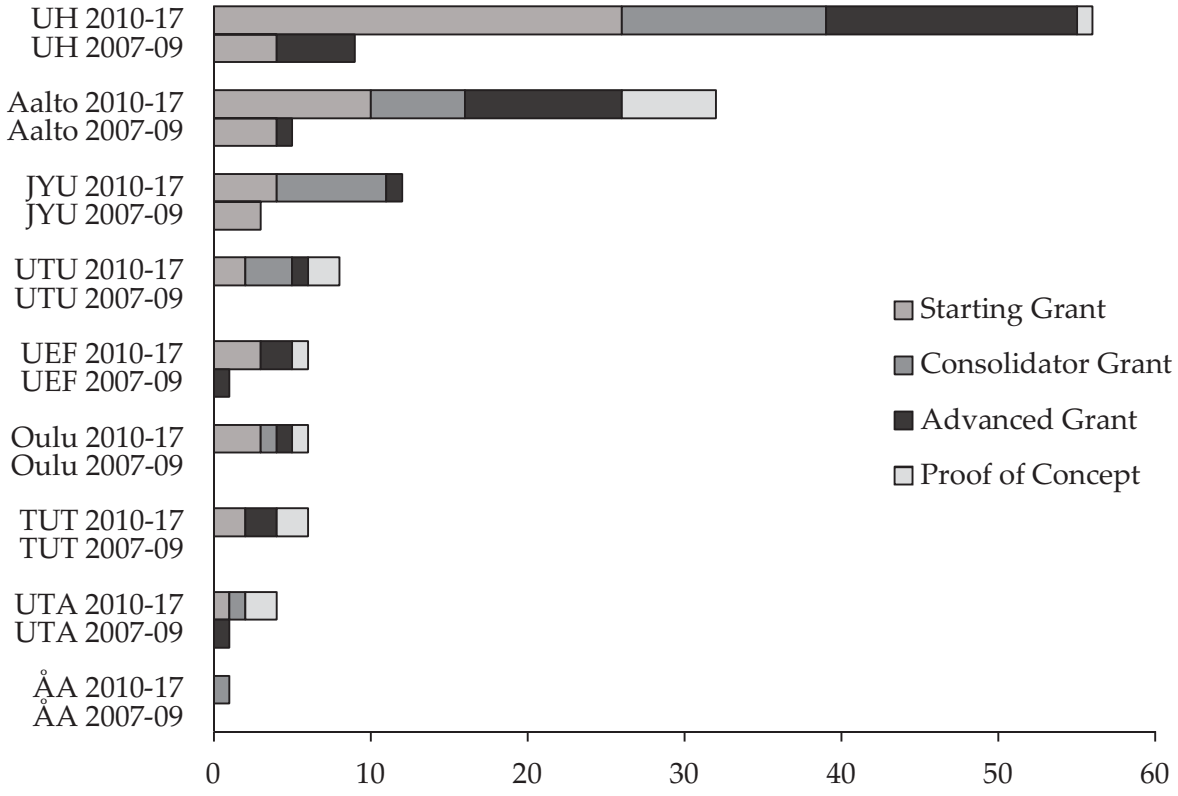

Figure 9. The number of European Research Council (ERC) funded projects at Finnish universities. Only projects with signed grant agreements have been included. Years refer to the call year. Abbreviations: Aalto = Aalto University, JYU = University of Jyväskylä, Oulu = University of Oulu, TUT = Tampere University of Technology, UEF = University of Eastern Finland, UH = University of Helsinki, UTA = University of Tampere, UTU = University of Turku, ÅA= Åbo Akademi University. Source: European Research Council (n.d.) (accessed on 21 Jan. 2019).

3.2.3. Publications

During the evaluation period, JYU researchers have produced about 3,400 publications annually, the majority of which (60%) as peer-reviewed scientific articles (Fig. 10). These publications include 104 highly cited papers (Table 8).

In 2010, a publication channel classification system, the Publication Forum (in Finnish *Julkaisufoorumi*, abbreviated as JUFO) was introduced in Finland. The purpose of the Publication Forum is to support publication quality assessment, and since 2015 it has served as a publication quality indicator in the Ministry of Education and Culture funding model. Publication activity is one the financing criteria in the model, and a publication's JUFO level is used to weight the publications.

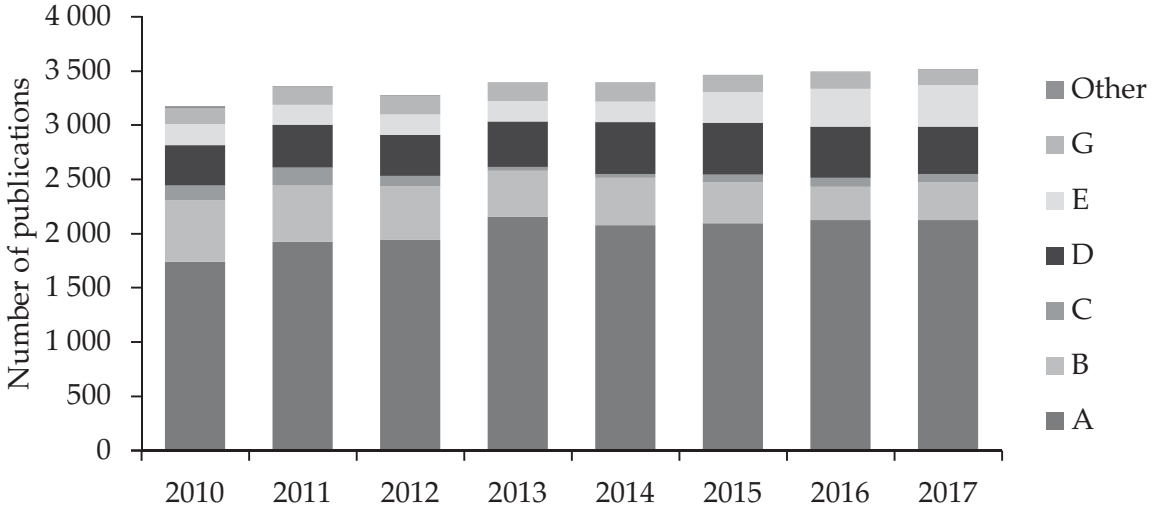

Figure 10. Publications at the University of Jyväskylä, 2010–2017. Categories: A = Peer-reviewed scientific articles, B = Non-peer reviewed scientific articles, C = Scientific books (monographs), D = Publications intended for professional communities, E= Publications intended for the general public, G = Theses, Other = Patents and innovation announcements & Public artistic and design activities & Audiovisual material & ICT software. Source: TUTKA Research Portal (accessed on 30 April 2018).

Table 8. Citations by publication type, University of Jyväskylä, 2010–2017.

	Total	% of output	h-index	Average citation per item	Sum of times cited	Without self-citations
All publications	8,429	–	100	11.16	94,029	80,343
Article, letter, review	7,846	93.1	100	11.91	93,478	79,962
Open access publications	2,250	26.7	75	14.85	33,407	30,620
Higly cited papers, hot papers	104	1.2	72	153.90	16,006	15,899
Open access, hot or highly cited papers	46	0.5	40	162.20	7,461	7,418

Notes: Higly cited papers are articles and reviews that rank in the top 1% by citations for field and year. Hot papers are papers that receive citations soon after publication, relative to other papers in the same field and age. Source: Web of Science (accessed on 16 Febr. 2018).

In 2012–2017, more than half of the JYU publications were placed in JUFO levels 1 to 3 (Fig. 11). About one third of all publications appeared in JUFO level 1 (basic level) and one-fifth in JUFO level 2 publication channels (leading level). Less than 10% were published in the category of the top channels (level 3). The high proportion of level 1 publications is not surprising, since most of the publication channels (about 87%), rated in levels 1 to 3, are classified into the basic level, whereas level 2 contains 10% and level 3 only 3% of the publication channels. The rating is done by expert panels, which are composed of over 200 Finnish or Finland-based scholars (Publication Forum 2018).

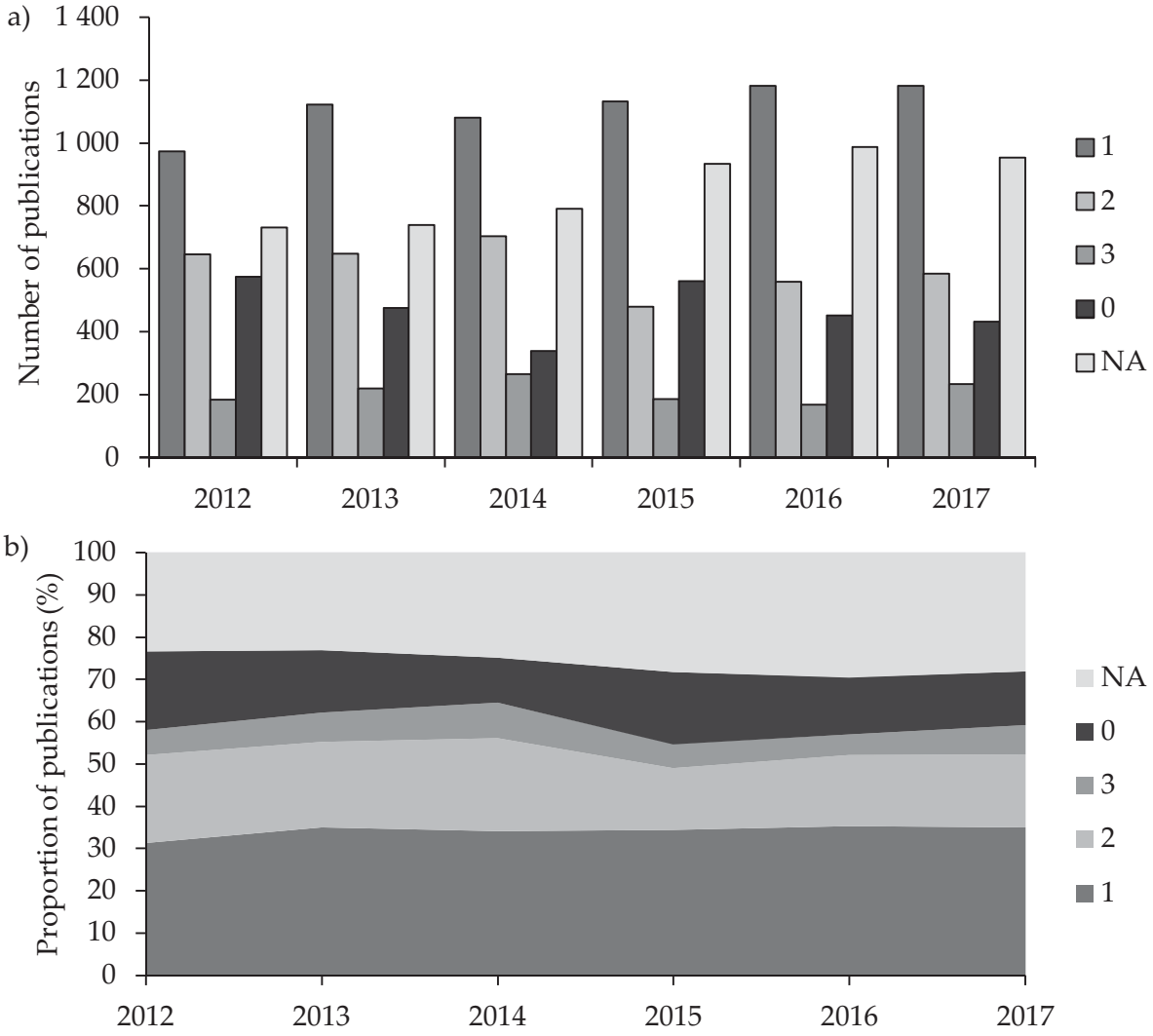

Figure 11. a) The number of and b) proportion of JYU publications by Publication Forum (JUFO) level, 2012–2017. Notes: JUFO-levels: 1 = Basic level, 2 = Leading level, 3 = Top level, 0 = Identified publication channels which have not received rating in the levels 1 to 3 and are marked as 0. NA = Professional, popular and most non-refereed scientific publications. Also publication channels which are under evaluation, and as of yet, without a rating. Source: TUTKA Research Portal (accessed on 10 Oct. 2018).

The time series presented in Figure 11 must be interpreted with caution. The ratings of publication channels can be subject to change as a result of re-evaluation, and particularly in 2015, the rating criteria became significantly tighter in most disciplines. This is the likely reason for the dip in the proportion of level 2 and 3 publications in 2015 (Pölönen & Ruth 2015). After 2015, the proportion of level 1 to 3 publications has slightly increased. The share of JUFO 2 and 3 level publications among all publications did not vary considerably between the larger multidisciplinary universities in 2017, ranging from 23% for the University of Turku to 27% for both the University of Oulu and Åbo Akademi University (26% for the University of Jyväskylä) (Vipunen Reporting Portal, accessed on 29 Jan. 2019).

In the University of Jyväskylä strategy for the years 2015–2020, one of the goals is to increase open access publishing (University of Jyväskylä 2014). According to the Web of Science (WoS) database, about one third of all publications were open access publications in 2010–2017 (Table 8). Since 2016, articles produced by JYU researchers have systematically been parallel published in the university repository JYX. This explains the simultaneous significant increase in the number of open access publications (Fig. 12). As the definition of open access has been vague and there is no reliable database on open access publishing, comparisons between universities are not reported.

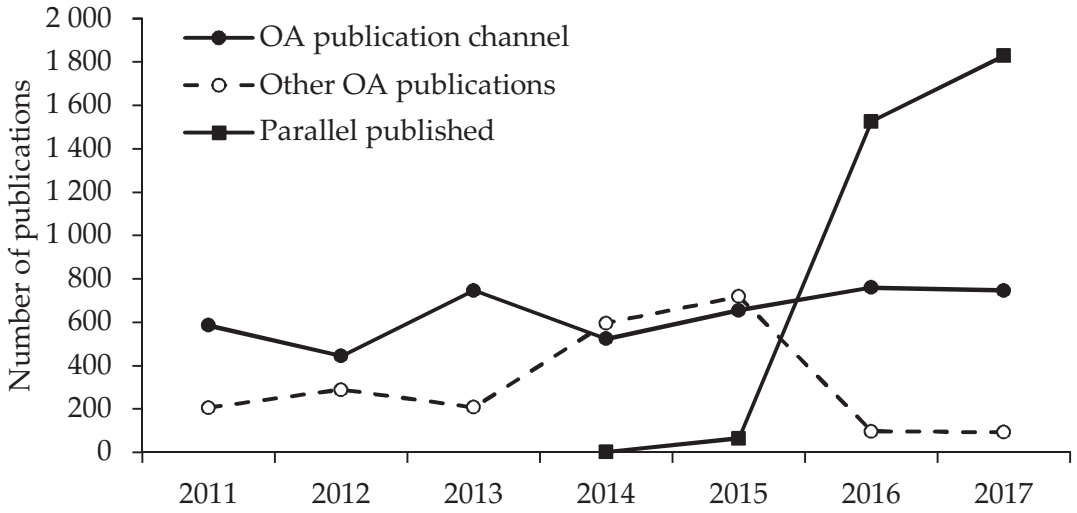

Figure 12. Open access (OA) publications, University of Jyväskylä, 2011–2017. Note: Since 2016, articles have systematically been parallel published in the university repository JYX. Source: Juuli portal (accessed on 30 Oct. 2018).

The following bibliometric analyses are limited to publications in the WoS database. As is well known, for various reasons the results of such bibliometric analyses should be interpreted with proper caution. First, the coverage of WoS greatly varies by research area. Second, the bibliometric analyses have been presented for research areas instead of the academic units of JYU. Consequently, the data should not be used to make comparisons between units in terms of their research output or impact. Third, some research areas used in the analyses are rather wide in order to ensure an adequate number of publications per field. This also affects comparisons between universities since the relative weight of individual disciplines within the research areas can significantly vary by university. (For more details, see section 4.3.2)

The citation analysis based on Category Normalised Citation Impact (CNCI) values indicates that the research areas at JYU vary greatly in their performance to accumulate citations on their publications, in comparison with other Finnish universities (Table 9). In some areas JYU is among the top universities whereas the opposite is true for some other areas. However, when comparing single universities, the number of publications is relatively small in many research areas, and in such cases, single very highly cited papers can have a large influence on the CNCI values. Therefore, Table 9 also shows another indicator, the percentage of documents cited. The conclusion based on this indicator is that in most research areas, in comparison with other universities, JYU researchers have been quite successful in attracting citations to their publications. Furthermore, as Table 10 shows, a fair share of JYU publications belong to the top 10% most cited papers, even though it is notable that the field-specific percentages are rather volatile because of the small number of these publications.

Table 9. Category Normalised Citation Impact (CNCI), percentage of documents cited, times cited and the number of research publications (P), major multidisciplinary Finnish universities, by research area, 2010–2017.

Research area, University	CNCI	% docs cited	Times cited	P
Sociology, philosophy, social work				
University of Helsinki	1.17	38.3	1,291	741
University of Tampere	1.17	60.0	391	145
University of Turku	1.09	37.3	293	196
University of Jyväskylä	**0.76**	**42.3**	**286**	**201**
University of Eastern Finland	0.65	55.7	124	70
Aalto University	–	–	–	–
University of Oulu	–	–	–	–
Music, psychology experimental, neuroscience				
University of Oulu	1.74	69.8	6,542	301
University of Jyväskylä	**1.71**	**74.9**	**4,796**	**419**
University of Eastern Finland	1.42	73.0	12,453	789
University of Helsinki	1.26	67.7	26,156	2,090
University of Turku	1.23	62.7	6,657	711
Aalto University	1.22	81.5	8,190	681
University of Tampere	1.00	58.8	3,621	456

Table 9 (continues)

Research area, University	CNCI	% docs cited	Times cited	P
Sport sciences				
University of Eastern Finland	1.26	81.8	680	88
University of Oulu	1.20	89.5	476	57
University of Tampere	1.19	77.9	458	68
University of Turku	1.10	76.5	771	85
University of Jyväskylä	**1.07**	**81.5**	**3,393**	**428**
University of Helsinki	0.86	77.5	631	102
Aalto University	–	–	–	–
Geriatrics, gerontology				
University of Eastern Finland	1.19	83.1	2,855	213
University of Turku	1.09	85.5	998	110
University of Helsinki	1.03	81.8	2,387	291
University of Tampere	1.03	83.1	1,310	136
University of Jyväskylä	**1.02**	**79.9**	**1,511**	**169**
University of Oulu	1.01	79.4	999	136
Aalto University	–	–	–	–
Education & educational research, psychology (educational)				
University of Oulu	2.54	49.7	829	157
University of Helsinki	1.67	59.7	2,370	670
University of Jyväskylä	**1.59**	**61.2**	**2,664**	**518**
University of Turku	1.45	54.8	1,594	305
University of Tampere	1.26	51.3	276	117
University of Eastern Finland	1.12	56.4	642	188
Aalto University	1.10	52.6	227	76
Computer science, information systems, information science & library science				
University of Tampere	2.15	60.3	837	219
Aalto University	1.58	55.2	3,986	1,015
University of Jyväskylä	**1.52**	**52.5**	**1,116**	**240**
University of Oulu	1.43	52.9	1,944	471
University of Helsinki	1.29	59.4	1,109	347
University of Turku	1.15	46.4	703	293
University of Eastern Finland	0.93	54.0	371	126
Computer science, artificial intelligence, mathematics, operations research & management science				
University of Oulu	1.70	42.9	762	282
Aalto University	1.48	52.9	2,089	730
University of Eastern Finland	1.26	49.4	310	162
University of Turku	1.23	46.1	272	180
University of Helsinki	1.22	49.7	731	433
University of Jyväskylä	**1.22**	**55.0**	**606**	**313**
University of Tampere	0.95	47.3	71	55

Table 9. (continues)

Research area, University	CNCI	% docs cited	Times cited	P
Business, management, economics				
Aalto University	1.58	66.2	8,504	1,185
University of Tampere	1.48	57.6	813	198
University of Oulu	1.39	69.3	1,715	251
University of Turku	1.37	53.9	2,662	507
University of Jyväskylä	**0.98**	**60.6**	**1,504**	**340**
University of Eastern Finland	0.90	46.3	673	229
University of Helsinki	0.90	53.7	2,125	531
Mathematics, mathematics (applied), statistics & probability				
University of Oulu	1.56	64.1	1,857	295
Aalto University	1.47	69.5	3,502	679
University of Helsinki	1.42	68.6	4,873	891
University of Jyväskylä	**1.40**	**68.6**	**2,241**	**547**
University of Eastern Finland	1.26	64.6	931	223
University of Turku	1.00	60.9	1,145	371
University of Tampere	0.59	63.1	317	103
Chemistry (multidisciplinary), chemistry (physical)				
University of Jyväskylä	**1.26**	**87.7**	**13,084**	**705**
University of Eastern Finland	1.17	84.8	5,837	387
Aalto University	1.09	79.4	25,505	1,609
University Oulu	1.09	84.2	4,929	392
University of Helsinki	1.08	81.1	16,836	1,120
University of Turku	1.04	84.8	3 907	343
University of Tampere	–	–	–	–
Physics (nuclear), physics (particle & fields)				
University of Helsinki	2.26	85.6	42,627	1,420
University of Jyväskylä	**1.80**	**78.7**	**16,564**	**1,114**
Aalto University	–	–	–	–
University of Oulu	–	–	–	–
University of Turku	–	–	–	–
Ecology, evolutionary biology, environmental sciences				
University of Helsinki	1.45	87.1	45,670	2,975
Aalto University	1.29	82.0	5,104	489
University of Eastern Finland	1.25	86.7	11,129	874
University of Turku	1.25	88.1	13,444	935
University of Oulu	1.24	84.2	11,362	777
University of Jyväskylä	**1.15**	**87.9**	**8,804**	**735**
University of Tampere	0.96	78.3	699	60

Notes: The Category Normalised Citation Impact (CNCI) of a document is calculated by dividing the actual count of citing items by the expected citation rate for documents with the same document type, year of publication and subject area. The universities are ranked by CNCI and the data include all publication types. The table reports only those JYU research areas that have produced at least 50 WoS publications during the evaluation period. As the publishing culture and WoS coverage differ by discipline, the data should only be used to make comparisons within research areas, not between them. Source: Web of Science.

Table 10. The proportion of top 10% (PP(top10%)) and number of publications (P) at Finnish universities in four science fields in 2010–2013 and 2013–2016.

Field, Period		JYU	Aalto	Oulu	UEF	UH	UTA	UTU
Social sciences and humanities								
2010–2013	PP(top 10%)	5.7	8.3	9.9	5.9	7.1	7.5	9.4
	P	312	327	190	173	706	279	294
2013–2016	PP(top 10%)	8.1	11.7	9.6	5.3	7.3	7.7	9.7
	P	444	374	239	179	962	332	397
Mathematics and computer science								
2010–2013	PP(top 10%)	14.6	10.3	11.1	11.1	14.7	–	9.3
	P	154	566	263	72	235	–	178
2013–2016	PP(top 10%)	11.4	12.8	13.1	9.9	11.5	3.0	11.5
	P	209	732	294	78	286	56	172
Physical sciences and engineering								
2010–2013	PP(top 10%)	9.5	10.0	6.7	9.9	10.5	–	9.0
	P	527	1,505	427	350	923	–	366
2013–2016	PP(top 10%)	9.8	11.5	9.5	7.2	12.7	–	7.8
	P	514	1 924	504	328	882	–	393
Life and earth sciences								
2010–2013	PP(top 10%)	10.1	9.5	9.7	8.5	11.9	–	12.0
	P	244	167	318	410	1,682	–	396
2013–2016	PP(top 10%)	7.4	9.3	7.7	8.7	10.9	–	10.2
	P	278	276	344	405	1 827	–	470
All sciences								
2010–2013	PP(top 10%)	9.0	9.7	8.6	9.2	11.4	8.5	9.6
	P	1,574	2,740	2,191	2,169	6,970	1,407	2,548
2013–2016	PP(top 10%)	8.8	11.4	9.5	8.7	10.8	7.8	9.7
	P	1,830	3,515	2,371	2,227	7,344	1,496	2,815

Notes: CWTS Leiden Ranking results are based on data derived from the WoS database. The index describes the proportion of publications that, compared with other publications in the same field and in the same year, belong to the top 10% most frequently cited publications. In addition to the University of Jyväskylä (JYU), the figures for the following universities have been reported: Aalto University (Aalto), University of Oulu (Oulu), University of Eastern Finland (UEF), University of Helsinki (UH), University of Tampere (UTA), and University of Turku (UTU). The CWTS Leiden Ranking takes into account only publications of the WoS document types *articles* and *reviews*. Authors' self-citations are excluded. There are also a number of other restrictions, explained on the Leiden Ranking website. Results have not been reported if the number of publications in the field has been less than 50. Source: CWRS Leiden Ranking (accessed on 11 Feb. 2019).

The most recent review of the state of scientific research in Finland, conducted by the Academy of Finland in 2018, concluded that inter-institutional collaboration, and in particular international collaboration, has a boosting effect on scientific impact, measured by citations (Auranen et al. 2018). JYU has acknowledged the importance of internationalisation as a tool to improve the quality of research and has focused on promoting academic mobility. As a rule, JYU has invited international applications when recruiting researchers. The proportion of international research personnel has increased in the 2010s and reached 17% (FTE) by the end of 2017 (Fig. 4 above). The proportion is somewhat lower than the average (22% in 2017) for all Finnish universities (Vipunen Reporting Portal).

To promote international academic mobility, JYU has offered services as well as funding to the research personnel. The International Staff Services has intensified its support and information activities to better serve those JYU staff members and personal grant receivers planning a research stay abroad as well as those international researchers arriving to stay at JYU. The JYU Science Council has provided research mobility grants for research visits abroad. In 2010–2017, the council has awarded 347 mobility grants for one- to three-month visits, totalling 753 visit months. The JYU International Office, in turn, has provided funding for one- to two-week teaching and research visits to partner universities in and outside Europe.

A number of issues suggest that researchers at JYU have actively collaborated with their peers in other universities. The results from the teaching and research staff survey, conducted at JYU in December 2017 and January 2018, indicate that the research personnel collaborate with their colleagues more actively internationally than nationally: 77% of professors, 71% of senior researchers and 48% of senior lecturers reported that they collaborate with international colleagues either continuously or often, whereas the percentages for national inter-institutional collaboration were 63%, 54% and 45%, respectively. Such differences could be anticipated since the pool of attractive potential collaborators is evidently much larger internationally than nationally.

Even though the research staff reports a high intensity of inter-institutional collaboration, the data retrieved from the TUTKA Research Portal show that researchers who are affiliated with JYU have authored the majority of JYU publications without co-authors from other institutions (Fig. 13). However, both national and international collaboration have increased from 2013 to 2017, with international collaboration being more extensive. In 2017, publications with international co-authors accounted for 31% of all JYU publications, compared to 25% in 2013. The share of no-collaboration publications, in particular, has been in decline.

The data on co-authored publications, derived from WoS, gives a somewhat different picture on the share of co-authored publications, thus reflecting the limited and selective coverage of WoS (Table 11). In 2011–2016, only one of four publications has been authored solely by a JYU researcher or researchers and about a half of all publications have been internationally co-authored. Differences between major multidisciplinary universities are relatively small in terms of international co-authoring, the share ranging from 44% (University of Tampere) to 59% (University of Helsinki). A similar pattern is detectable even when looking at individual fields of

science. The variations in the proportion of internationally co-authored publications reflect more field-specific publication cultures than differences between the universities. This observation, however, should not be taken to signify that the current situation, on the whole, is fully satisfactory for JYU. In some fields the percentage of internationally co-authored publications is far below the highest scoring universities and even clearly below the average of the universities included in Table 11. These findings give the faculties grounds for analysing their publication culture, and if found reasonable, may lead them to take actions to improve the degree of international collaboration.

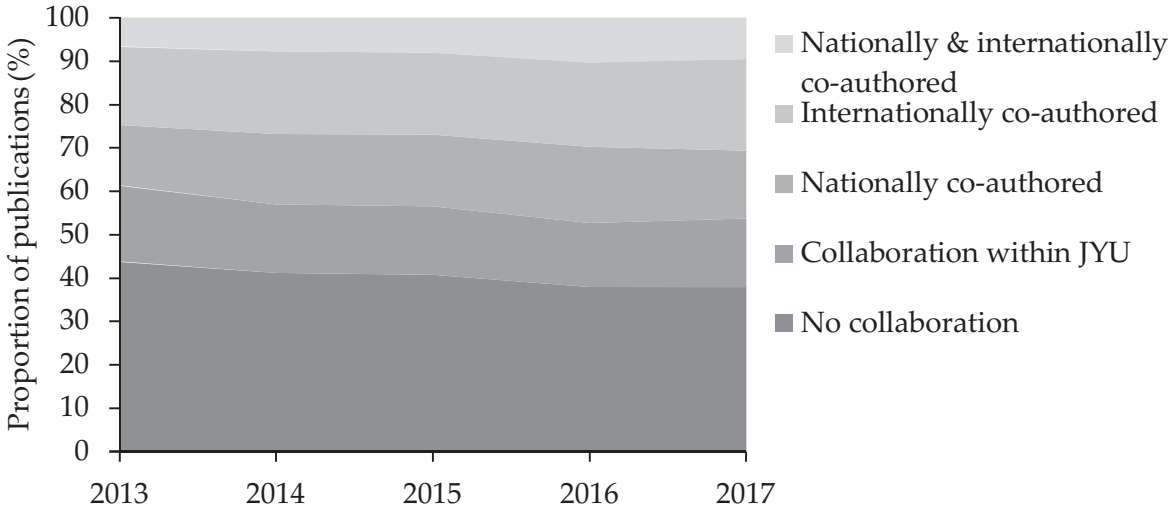

Figure 13. Publications authored by JYU-affiliated researchers divided into groups based on the type of collaborative authorship, 2013–2017. Notes: A nationally co-authored publication refers to publications where all authors are affiliated with a Finnish organisation. An internationally co-authored publication means that at least one author is affiliated with a non-Finnish organisation. Reliable data for the years 2010–2012 were not available. Source: TUTKA Research Portal (accessed on 10 Oct. 2018).

Table 11. Publications distributed into categories based on co-authorship, University of Jyväskylä and seven other major multidisciplinary Finnish universities, 2011–2016. The universities have been ranked by the proportion of internationally co-authored publications.

Field of science and University	Internationally co-authored Volume	%	Nationally co-authored Volume	%	Single organisation Volume	%	Total publications Volume
All publications							
University of Helsinki	14,075	59	5,645	24	4,089	17	23,809
University of Turku	5,581	57	2,744	28	1,523	15	9,848
University of Jyväskylä	**3,439**	**54**	**1,386**	**22**	**1,535**	**24**	**6,360**
Åbo Akademi University	1,695	54	706	22	763	24	3,164
Aalto University	6,565	53	2,002	16	3,756	30	12,323
University of Eastern Finland	4,143	53	2,675	34	1,062	13	7,880
University of Oulu	4,434	52	2,287	27	1,740	21	8,461
University of Tampere	2,204	44	2,154	43	604	12	4,962
All eight universities	35,788	55	13,811	21	14,957	23	64,556
Mathematics & Statistics							
University of Eastern Finland	119	67	19	11	39	22	177
University of Helsinki	370	58	62	10	207	32	639
University of Jyväskylä	**249**	**58**	**50**	**12**	**133**	**31**	**432**
Aalto University	268	54	70	14	157	32	495
University of Tampere	42	53	12	15	26	33	80
University of Turku	128	48	32	12	106	40	266
University of Oulu	94	45	29	14	88	42	211
Åbo Akademi University	37	43	17	20	33	38	87
All eight universities	1,201	56	162	8	785	37	2,148
Physical sciences, Geosciences, Space science							
University of Turku	1,055	78	153	11	143	11	1,351
University of Helsinki	3,638	75	630	13	594	12	4,862
University of Jyväskylä	**1,092**	**70**	**185**	**12**	**285**	**18**	**1,562**
University of Oulu	1,011	67	178	12	316	21	1,505
Aalto University	2,325	61	475	12	1,014	27	3,814
University of Eastern Finland	646	61	236	22	183	17	1,065
Åbo Akademi University	181	58	75	24	54	17	310
University of Tampere	32	44	32	44	9	12	73
All eight universities	8,847	69	1,396	11	2,560	20	12,803
Chemical sciences, Chemical engineering							
University of Jyväskylä	**528**	**65**	**125**	**15**	**163**	**20**	**816**
University of Tampere	45	63	26	37		0	71
University of Helsinki	916	62	293	20	263	18	1,472
University of Eastern Finland	373	60	151	24	98	16	622
Åbo Akademi University	591	57	183	18	259	25	1,033
Aalto University	1,108	57	353	18	478	25	1,939
University of Turku	293	52	133	24	133	24	559
University of Oulu	295	51	133	23	149	26	577
All eight universities	3,758	60	973	16	1,542	25	6,273

Table 11. (continues)

Field of science and University	Internationally co-authored Volume	%	Nationally co-authored Volume	%	Single organisation Volume	%	Total publications Volume
ICT & Electronics							
University of Helsinki	375	46	184	22	260	32	819
University of Oulu	719	45	155	10	723	45	1,597
Aalto University	1,792	45	515	13	1,677	42	3,984
University of Eastern Finland	195	44	75	17	178	40	448
University of Turku	294	39	114	15	343	46	751
University of Jyväskylä	**210**	**38**	**86**	**15**	**260**	**47**	**556**
Åbo Akademi University	104	33	61	19	148	47	313
University of Tampere	67	26	66	25	129	49	262
All eight universities	3,528	43	965	12	3,715	45	8,208
Ecology, Environmental sciences, Plant biology							
University of Turku	988	64	344	22	216	14	1,548
University of Helsinki	2,766	63	941	21	715	16	4,422
Åbo Akademi University	301	62	119	25	63	13	483
University of Tampere	146	53	104	38	23	8	273
University of Eastern Finland	539	53	359	36	111	11	1,009
University of Oulu	465	52	324	36	99	11	888
University of Jyväskylä	**404**	**52**	**241**	**31**	**137**	**18**	**782**
Aalto University	232	50	134	29	101	22	467
All eight universities	5,053	61	1,748	21	1,458	18	8,259
Biomedicine, Biosciences							
University of Helsinki	3,067	63	1,196	25	582	12	4,845
University of Turku	1,228	63	552	28	168	9	1,948
University of Jyväskylä	**402**	**63**	**163**	**25**	**78**	**12**	**643**
Åbo Akademi University	331	62	151	28	53	10	535
Aalto University	446	61	198	27	82	11	726
University of Oulu	794	61	404	31	105	8	1,303
University of Tampere	621	59	407	38	31	3	1,059
University of Eastern Finland	1,153	58	654	33	180	9	1,987
All eight universities	6,386	63	2,520	25	1,273	13	10,179
Health care science							
Åbo Akademi University	56	57	23	23	20	20	99
University of Turku	407	50	361	44	52	6	820
University of Helsinki	688	50	541	39	158	11	1,387
University of Jyväskylä	**295**	**49**	**232**	**38**	**76**	**13**	**603**
University of Eastern Finland	373	46	370	46	60	7	803
University of Tampere	375	45	400	48	62	7	837
University of Oulu	208	41	250	49	51	10	509
Aalto University	28	35	33	41	19	24	80
All eight universities	1,980	49	1,596	39	490	12	4,066

Table 11. (continues)

Field of science and University	Internationally co-authored Volume	%	Nationally co-authored Volume	%	Single organisation Volume	%	Total publications Volume
Materials engineering							
University of Tampere	35	66	18	34	0	0	53
University of Turku	200	65	74	24	33	11	307
University of Helsinki	330	65	117	23	62	12	509
Aalto University	799	59	199	15	353	26	1,351
Åbo Akademi University	192	59	69	21	65	20	326
University of Eastern Finland	144	59	41	17	60	24	245
University of Oulu	201	55	66	18	99	27	366
University of Jyväskylä	**104**	**50**	**54**	**26**	**50**	**24**	**208**
All eight universities	1,770	61	433	15	722	25	2,925
General medicine (incl. Dentistry)							
University of Helsinki	2,769	56	2,003	40	176	4	4,948
Åbo Akademi University	126	56	88	39	12	5	226
University of Turku	1,386	54	1,129	44	68	3	2,583
University of Eastern Finland	1,096	52	976	46	54	3	2,126
Aalto University	192	50	133	34	61	16	386
University of Oulu	957	49	919	47	67	3	1,943
University of Jyväskylä	**215**	**49**	**183**	**42**	**39**	**9**	**437**
University of Tampere	1,013	45	1,195	53	31	1	2,239
All eight universities	5,938	53	4,789	43	505	4	11,232
Economics							
Åbo Akademi University	42	53	12	15	25	32	79
Aalto University	422	50	135	16	285	34	842
University of Turku	122	38	89	28	107	34	318
University of Jyväskylä	**89**	**34**	**72**	**27**	**103**	**39**	**264**
University of Tampere	44	33	56	42	32	24	132
University of Helsinki	92	33	66	24	122	44	280
University of Eastern Finland	39	32	39	32	43	36	121
University of Oulu	61	31	64	32	72	37	197
All eight universities	850	42	381	19	786	39	2,017
Psychology							
University of Turku	216	58	109	29	47	13	372
Aalto University	114	56	66	32	24	12	204
Åbo Akademi University	49	55	21	24	19	21	89
University of Jyväskylä	**250**	**51**	**145**	**30**	**96**	**20**	**491**
University of Helsinki	346	46	219	29	188	25	753
University of Eastern Finland	56	45	49	39	20	16	125
University of Oulu	64	45	57	40	22	15	143
University of Tampere	103	40	116	45	39	15	258
All eight universities	927	50	466	25	449	24	1,842

Table 11. (continues)

Field of science and University	Internationally co-authored Volume	%	Nationally co-authored Volume	%	Single organisation Volume	%	Total publications Volume
Educational sciences							
University of Jyväskylä	**101**	**33**	**57**	**18**	**152**	**49**	**310**
University of Oulu	28	31	24	27	37	42	89
University of Eastern Finland	42	29	42	29	59	41	143
University of Turku	56	29	60	31	79	41	195
Aalto University	15	25	15	25	30	50	60
University of Helsinki	99	22	103	23	255	56	457
University of Tampere	13	19	30	44	25	37	68
Åbo Akademi University	–	–	–	–	–	–	–
All eight universities	332	28	208	17	651	55	1,191
Other social sciences							
Aalto University	129	38	89	26	126	37	344
Åbo Akademi University	59	37	34	21	66	42	159
University of Eastern Finland	80	37	56	26	80	37	216
University of Jyväskylä	**123**	**35**	**74**	**21**	**156**	**44**	**353**
University of Oulu	106	34	64	20	143	46	313
University of Helsinki	286	31	181	19	470	50	937
University of Turku	105	29	106	29	154	42	365
University of Tampere	93	20	121	26	244	53	458
All eight universities	886	32	485	17	1,421	51	2,792
Humanities							
Aalto University	43	31	35	26	59	43	137
University of Oulu	41	31	32	24	60	45	133
University of Eastern Finland	22	19	14	12	77	68	113
University of Helsinki	157	17	99	11	657	72	913
University of Jyväskylä	**41**	**17**	**34**	**14**	**172**	**70**	**247**
University of Turku	39	16	47	19	156	64	242
University of Tampere	17	11	38	25	98	64	153
Åbo Akademi University	9	11	9	11	67	79	85
All eight universities	336	18	189	10	1,323	72	1,848
Multidisciplinary journals							
University of Oulu	251	79	55	17	13	4	319
University of Helsinki	855	74	214	18	92	8	1,161
University of Jyväskylä	**141**	**73**	**34**	**18**	**19**	**10**	**194**
Aalto University	222	73	52	17	32	10	306
University of Eastern Finland	214	71	68	23	20	7	302
University of Turku	302	71	99	23	27	6	428
University of Tampere	128	64	69	35	2	1	199
Åbo Akademi University	66	64	29	28	8	8	103
All eight universities	1,688	73	397	17	213	9	2,298

Notes: The classification of the fields of science used in the table is a modification from the classification used by Statistics Finland, which in turn, is based on the International Standardisation of Statistics on Science and Technology. Only fields with the minimum of 100 JYU publications have been reported (the group *All publications* includes all fields of science). Data have not been reported for other universities if the number of publications in the field has been less than 50. The data have been reported as unfractionalised publication counts, based on the WoS database. A nationally co-authored publication refers to publications where all authors are affiliated with a Finnish organisation. An internationally co-authored publication means that at least one author is affiliated with a non-Finnish organisation. A single organisation publication means that all authors are affiliated with the host organisation. Source: Vipunen Reporting Portal (accessed on 7 Jan. 2019).

In 2010–2017, JYU researchers had research collaborators in 134 countries/regions, based on co-authored papers in the WoS database. Table 12 shows the lists of top 25 collaboration countries/regions of the JYU-affiliated publications for three 4-year periods, thus allowing comparison with the period when the previous research evaluation was carried out (2005–2009). Finland is the leading country, as is obvious. The other countries/regions with co-publications were overwhelmingly from Europe and Northern America, the latter represented by Canada and the United States. For all three periods, the highest number of co-authors in international publications were from the U.S. The largest share of co-authors in international publications, however, were from European countries. The European countries on all three lists are largely the same, even though their ranking varies from period to period. Only a few countries, often those with just a small frequency of co-authorships, make a temporary appearance on the lists.

The U.S. and Europe are still strong regions in terms of R&D performance (National Science Foundation 2018), and therefore, maintaining lively research collaboration with researchers in these regions can be easily justified. Some countries from the third important region, East/South-East and South Asia with increasing performance in R&D, can also be found on the top 25 list (Japan, China mainland, India, and South Korea), and the relative position of these countries has improved across the periods. In both 2010–2013 and 2014–2017, mainland China has been among the top 10 countries/regions with co-authored papers.

Table 12. Top 25 collaboration countries/regions of the University of Jyväskylä researchers, based on co-authored papers (P = number of publications) in 2006–2017.

	2006–2009		2010–2013		2014–2017	
Country	Rank	P	Rank	P	Rank	P
Finland	1	2,742	1	3,529	1	5,013
USA	2	352	2	560	2	796
Germany	3	251	3	411	4	577
England	4	185	4	341	3	610
Sweden	5	140	6	276	5	471
France	6	136	5	283	6	451
Russia	7	104	7	227	8	355
Spain	8	97	8	200	9	312
Italy	9	92	11	178	10	301
Canada	10	89	24	100	21	199
Switzerland	11	86	15	172	12	291
Poland	12	74	10	187	14	261
Netherlands	13	64	12	177	11	296
Belgium	14	63				
Japan	15	62	12	177	13	284
Australia	16	56	20	109	20	226
Denmark	17	46	12	177	17	237
Czech Republic	18	40	17	139	16	243
Norway	19	38	19	127	15	251
Hungary	20	32	16	158	19	232
Portugal	21	30				
Austria	22	29				
China mainland	22	29	9	193	7	378
Slovakia	24	27	25	94		
India	25	26	18	134	18	233
Brazil			21	105	22	177
South Korea			22	104	23	175
Greece			23	101		
South Africa					24	169
Croatia					25	166

Notes: Based on country/region information given by the authors. If a paper has multiple authors from the same country, the country has been counted only once. Source: Web of Science (accessed on 15 Feb. 2019).

3.3. University of Jyväskylä and international ranking lists

In international university rankings, higher education institutions are typically evaluated based on volume and scientific impact of research, level of internationalisation and extent of reputation in the global academic community. However, the methodologies of different rankings vary considerably. Some emphasise bibliometric indicators (e.g., Academic Ranking of World Universities and CWTS Leiden Ranking) and some are based more on institutions' international reputations (e.g., QS World University Rankings and Times Higher Education World University Rankings). In addition, ranking organisations use different research databases to retrieve information on the research performance of universities (e.g., THE uses Elsevier's Scopus database whereas ARWU uses Clarivate's Web of Science). All these methodological differences and the fact that the number of institutions accepted on different ranking lists changes almost every year makes it very difficult to compare these lists in a meaningful way.

Most Finnish multidisciplinary research universities are ranked on the most widely recognised institutional ranking lists in the world, specifically Academic Ranking of World Universities (more commonly known as the Shanghai List), QS World University Rankings, Times Higher Education World University Rankings, U.S. News & World Report Global Universities Ranking, National Taiwan University Performance Ranking of Scientific Papers for World Universities, Center for World University Rankings, and CWTS Leiden Ranking (Fig. 10). Over the past decade, the position of the University of Jyväskylä has remained relatively constant on these lists (Fig. 14).

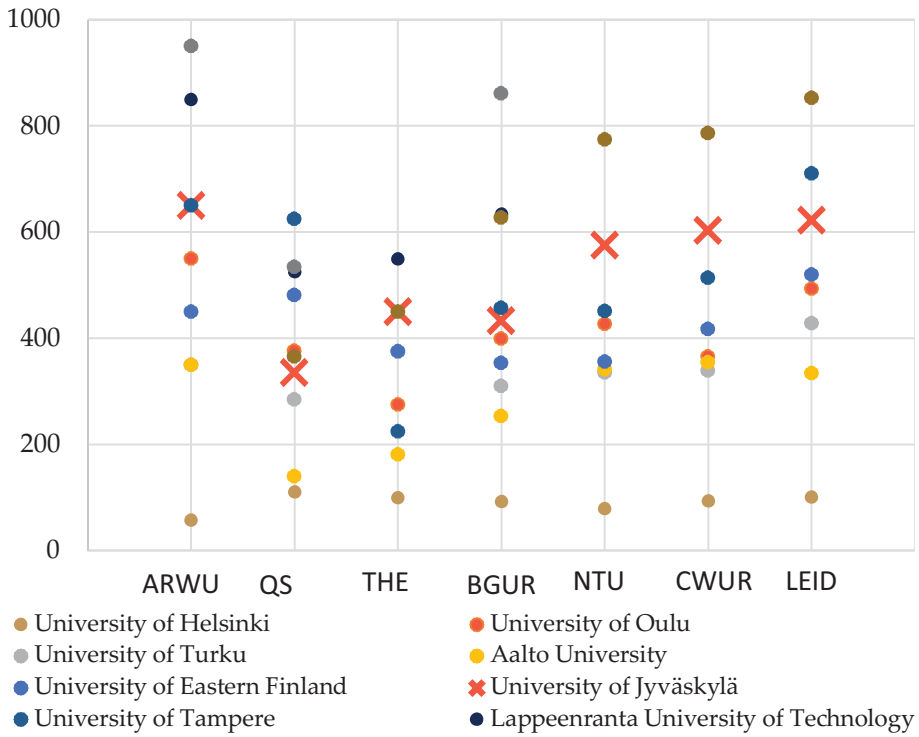

Figure 14. Finnish universities in international university rankings in 2018. Source: University of Jyväskylä Data Centre (accessed 14 Dec. 2018).

The University of Jyväskylä typically ranks relatively better in institutional rankings in which education-related indicators have a larger share or a stronger weighting in the ranking methodology (e.g., student–staff ratio, reputation of the university among its graduates' employers in QS World University Rankings). JYU's relative position is not as strong in those rankings that employ methodologies based mainly or fully on bibliometric data (e.g., Leiden or NTU) or methodologies focusing on highly cited researchers or high-profile awardees among faculty (e.g., Nobel laureates or Fields Medal recipients in ARWU).

In addition to institutional-level university rankings, all leading ranking organisations have also started publishing field- and subject-specific rankings. The methodologies for these rankings have been tailored and customised according to each field, and thus these field-specific rankings provide more detailed and specific information on institutions' research performance. Table 13 lists field-specific rankings from two ranking organisations, showing that many JYU fields have performed well in these rankings. Because of differences in methodologies and dissimilarities in the classification of fields, these two rankings cannot be compared in a straightforward way, but some fields stand out in both rankings, particularly education.

Table 13. JYU in selected international field- and subject-specific rankings, Academic Ranking of World Universities 2018 and Times Higher Education World Universities Rankings by Subject 2019.

Field or subject	Rank
Academic Ranking of World Universities 2018	
Mathematics	101—150
Physics	301—400
Chemistry	201—300
Ecology	201—300
Computer Science & Engineering	301—400
Biological Sciences	401—500
Education	101—150
Communication	201—300
Psychology	201—300
Business Administration	301—400
Management	301—400
Global Ranking of Sport Science Schools and Departments	29
Times Higher Education World University Rankings by Subject 2019	
Arts & Humanities	176—200
Education	95
Computer Science	401—500
Physical Sciences	301—400
Clinical, pre-clinical and health	301—400
Psychology	151—175
Business & Economics	301—400
Social Sciences	201—250

Sources: Academic Ranking of World Universities: www.shanghairanking.com/Shanghairanking-Subject-Rankings/index.html (accessed on 19 July 2018). Times Higher Education World University Rankings by subject:www.timeshighereducation.com/world-university-rankings/by-subject (accessed on 13 Nov. 2018).

3.4. Doctoral training at the University of Jyväskylä

The University of Jyväskylä Graduate School for Doctoral Studies (JYUGS) was launched in August 2011. The JYUGS and similar systems in other universities replaced the previous systematic doctoral training model, established in 1995, that was based on the idea of national graduate schools. The Ministry of Education and Culture provided funding for hiring full-time doctoral students, and the Academy of Finland provided additional funding for other expenses, primarily for courses and other events. Most of these previous graduate schools were thematic and organised jointly by several universities. The graduate schools were not separate institutes within the universities, and the universities or their faculties continued awarding the doctoral degrees. Some shortcomings were obvious with this system. The graduate schools did not cover all the disciplines and a fair share of doctoral students were not attending any of the existing graduate schools.

The current doctoral training system at JYU follows the guidelines of the national policy statements, according to which each university should have only one, or at most just a few, graduate schools. Even in the current system, the graduate schools are not separate institutes and do not award doctoral degrees. The JYUGS evaluates doctoral training at JYU, plans development actions, coordinates studies that develop students' transferable skills, and steers the faculties in implementing doctoral training according to the rules and principles of JYU. Each of the six faculties has its own Doctoral School, led by the Dean or Vice Dean, and which consists of individual doctoral programmes, totalling 17. Thus, the current doctoral programmes at JYU are local and discipline-specific, even though some units collaborate with other universities in doctoral training. Every doctoral student at JYU is enrolled in one of the doctoral schools. The previous separate funding from the Ministry of Education and Culture has been merged with the core funding of the universities, which decide how the funds earmarked for doctoral training are allocated. On the average, about 40 doctoral students could be hired annually for a period of four years using the funds that JYU allocates to the doctoral schools.

The main part of the doctoral training programme consists of writing up a thesis that the doctoral student submits to one of the faculties as her/his dissertation. The dissertation can be either a monograph or a so-called compilation thesis, i.e., a collection of scientific peer-reviewed publications (or, manuscripts accepted for publication) with an introduction explaining the research questions, principal research methods, results and conclusions of the thesis. The JYUGS has defined university-level dissertation requirements but has not set any strict rules regarding the number of publications in a compilation thesis. Typically, they include three to five publications. The doctoral student must defend her/his dissertation in public (i.e., has a public examination).

The doctoral training programmes also include doctoral studies consisting of 30–60 credits (ECTS) of course work, the number of credits varying by faculty. The doctoral curriculum of each faculty defines the structure of the doctoral programme, but all the curricula should reflect the general learning outcomes defined by the

JYUGS. From 2017, doctoral studies have been structured so that they ensure expertise in both discipline-specific skills and transferable skills (research competence, communication skills and other competences that support the construction of professional expertise). The transferable skills studies are mostly offered by specific units of JYU to all doctoral students (e.g., the Language Centre, the Methodology Centre for Human Sciences, and the Open Science Centre). When applying for doctoral studies, applicants draw up a personal study plan in cooperation with their supervisors. Doctoral studies and the thesis work should be planned so that full-time students can complete their degree in four years. A follow-up group appointed for each student should monitor students' progress in their studies once a year.

Doctoral training at JYU was internally evaluated in spring 2016. The evaluation process contained self-evaluations by the doctoral schools, school-specific evaluation discussions, and discussion between doctoral school representatives envisioning the future of the system. The evaluation process resulted in several development goals for doctoral training. They were reported in a detailed development plan that includes a number of specific actions and extends to 2020. The summary of the evaluation report has been published in English and is available at www.jyu.fi/fi/tutkimus/tohtorikoulutus/tohtorikoulutuksen-arviointi/.

4 THE RESEARCH EVALUATION PROCESS

The focus of the 2018 research evaluation process was on the attributes of the research environment that are conducive to high-quality research and scientific renewal rather than on research performance. The purpose of the research evaluation process was not to compare the units of JYU against one another, nor did it result in grading the units' performance. The primary goal was to recognise each unit's strengths and development needs, thus leading to measures that would improve the quality of the research at the University of Jyväskylä. Furthermore, the University of Jyväskylä has used the outcomes of the evaluation when preparing the university-level development actions in research, linking them to the new strategy of the University that has been completed during spring 2019.

4.1. Self-evaluations and development plans

All the faculties, departments and independent institutes that have the obligation to conduct research were evaluated. For the evaluation, the units of JYU were grouped into 11 evaluation units:

1. Department of Social Sciences and Philosophy
2. Department of History and Ethnology & Department of Music, Art and Culture Studies
3. Department of Language and Communication Studies & Centre for Applied Language Studies
4. Faculty of Sport and Health Sciences
5. Faculty of Education and Psychology & Finnish Institute for Educational Research
6. Faculty of Information Technology
7. Jyväskylä University School of Business and Economics
8. Department of Mathematics and Statistics
9. Department of Physics & Department of Chemistry
10. Department of Biological and Environmental Science
11. Kokkola University Consortium Chydenius

The first step of the actual evaluation process was to produce a self-evaluation report for all the evaluation units. This process took place between 16 March and 15 May 2018. Each evaluation unit appointed internal teams to author the report. The teams were comprised of researchers from different career stages (Appendix 1). The teams were provided with sets of background material related to the topics of the self-evaluation template (briefly described in section 4.3 and detailed in Appendix 2). The self-evaluation template invited the units to reflect on their practices, strengths, and weaknesses in recruitment, career and mobility, research leadership, profiling areas and emerging areas, academic culture, infrastructure, funding, collaboration, publication, evaluation/feedback practices, and research-teaching linkages (Appendix 1). The evaluation units were instructed to put their main focus on those topics which

were the most relevant ones from their perspective. Based on the self-evaluation, each evaluation unit had to prepare a preliminary development plan outlining the most critical steps that the unit (and the University) should take to improve the quality of the scientific research. Based on the feedback provided by the international peer evaluation report, each unit finalised their development plans by 12 December 2018. In these they described the measures they were going to take to achieve the targets.

4.2. The international evaluation panel

To provide the evaluation units external, insightful feedback on their preliminary development plans, an international eight-person research evaluation panel was set up to carry out an external peer evaluation. The faculties and independent units were asked to propose two to three candidates for the panel, listed in order of preference. The research evaluation team screened the 42 nominees according to the requirements listed below and proposed eight candidates to the leadership of JYU so that the panel members' areas of expertise would cover the JYU research areas as widely as possible. The requirements for the panel members were as follows:

- be independent: The candidate did not have, for example, co-authored publications or research collaboration with a JYU staff member in 2010–2018, had not been employed (including working on a grant), awarded honorary doctorate degree, or the title of docent by JYU
- have extensive experience in academic leadership: The candidate had acted as, for example, the vice rector of a university, or dean of a large and preferably multidisciplinary faculty
- commit to attending a lengthy, five-day site visit to the University of Jyväskylä in September 2018.

In addition, one panel member was expected to have a good insight into the academia and research cultures of Finland.

The panel was comprised of the following distinguished scholars:

Chair

Sue Scott
Honorary Professor, Centre for Women's Studies, University of York, UK

Panel members

Marcel van Aken
Dean, Faculty of Social and Behavioral Sciences, Utrecht University, the Netherlands

Colin Boreham
Director, Institute for Sport and Health, University College Dublin, Ireland

Felicity A. Huntingford
Emeritus Professor of Functional Ecology, Institute of Biodiversity, Animal Health & Comparative Medicine, University of Glasgow, UK

Herman de Jong
Dean, Professor of Economic History, Faculty of Economics and Business, University of Groningen, the Netherlands

Matthew K. O. Lee
Vice-President (Development & External Relations), Chair Professor of Information Systems and E-Commerce, City University of Hong Kong

Anne Pauwels
Professor of Sociolinguistics, Department of Linguistics, School of Languages, Cultures and Linguistics, University of London, UK

Marja-Liisa Riekkola
Professor of Analytical Chemistry, Department of Chemistry, University of Helsinki, Finland

The evaluation units' self-assessment reports and an extensive set of background materials were sent to the panel members on 28 June 2018, so they could prepare themselves for the site visit. The role of the panel was to review the preliminary development plans by the evaluation units and give constructive feedback and recommendations on how the units can further develop their research environment and the quality of the research. The purpose of the site visit, which took place on 10–14 September 2018, was to offer a possibility to complement and deepen the information provided by the written materials through meetings with the JYU leadership and research personnel interviews.

The site visit started with a half-day common session during which the rector and the deans/vice deans gave a general overview of JYU and its faculties and independent institutes. Most of the programme was reserved for sessions during which the panel members visited the units of JYU. During these sessions, the heads/vice heads of departments and institutes gave a presentation on their unit's research activities, after which the panel members had a chance to interview selected members of the research staff. When the units felt it was relevant, the staff also introduced their research facilities to the panel.

In each unit, the group interviews of the research staff were conducted in two parts. The first group comprised of Doctoral Students and junior researchers, and the second one of department and faculty leadership and Senior Researchers (the interviewees are listed in Appendix 4 by unit). The evaluation units had selected the persons for the group interviews. Because there were two to three parallel interviewing sessions the group interviews were conducted by sub-panels of two to four members. In addition to these group interviews, the panel also interviewed Vice Rector Henrik Kunttu and Graduate School Coordinator Tuula Oksanen.

After the site visit, the panel authored a joint qualitative report in which the panel described their findings and gave feedback and recommendations both to the University and to its units. The final panel report was submitted to the University on 29 November 2018. The evaluation units finalised their development plans by 12 December 2018, after having received the panel report.

4.3. Background material

4.3.1. Contents of the material

The evaluation units were provided with background data to support their self-evaluation process and preparation of the research development plans. The following data sets were compiled for the units (for a detailed description, see Appendix 2):

- Data on research personnel (Source: JYU Personnel data system, JYU Student registry)
- Annual financial data (Source: SAP Financial accounting system)
- Research infrastructure facilities (Source: Units' webpages)
- Annual number of awarded doctoral degrees (Source: JYU Student registry)
- Research visits (Source: TUTKA Research Portal)
- Bibliometric data (Sources: TUTKA Research Portal, Vipunen Reporting Portal, Web of Science database).

The evaluation units were also given the relevant faculty level results from the research and teaching staff survey Teaching, Research and Career at the University of Jyväskylä, which was conducted between December 2017 and January 2018. Furthermore, the Academy of Finland's 2016 review of the State of Scientific Research in Finland was also distributed to the evaluation units. The review contains analyses of several research input and output indicators for Finnish universities and research institutes (research personnel, funding, publishing, scientific impact, and co-publications).

In addition to the above-mentioned data, the CWTS Leiden Ranking results were reported to those evaluation units in which the researchers focus on the following fields of science: 1) Life and earth sciences, 2) Mathematics and computer science, 3) Physical sciences and engineering, and 4) Social sciences and humanities (see Table 10 above). The units were also reminded that the CWTS Leiden Ranking takes into account only publications of the WoS document type "articles and reviews".

Another strong reminder to the units was that the object of the bibliometric analyses was not to assess each unit's research performance per se or to lead to comparisons between the fields within the university. All the background data were meant to serve the units when they were writing their self-evaluation and drafting their research development plan. With the help of the bibliometric data, the evaluation units were able to identify, for example, the publication patterns of the researchers, trends over the period 2010–2017, and the collaboration profile. Comparisons, as far as the data permitted, could be done with the same fields in other Finnish universities.

The bibliometric analyses, which included both quantitative and qualitative indicators, were based on the data retrieved from TUTKA Research Portal, Vipunen Reporting Portal, and the WoS database. Each of these data sources allowed the analysis of the publication output from a different perspective. TUTKA is JYU's research and publication database, which has information about the research activities of the JYU affiliated research staff. As TUTKA should include data on all publications produced at JYU, it gives the most complete account of the overall publication output

of the University, covering all the disciplines. TUTKA, however does not allow for comparisons across universities. Vipunen is the Education Statistics Finland reporting portal, which covers all Finnish educational and research organisations, including academic universities. The publication data, used by Vipunen, have been retrieved from the universities' own research portals. The Vipunen portal enables national comparisons of the publication data in the form of aggregated reports. The WoS database adds a global perspective by permitting comparisons across different countries. The coverage of WoS, however, is not universal and varies widely between the disciplines (Table 14). For a publication to be included in the analyses, at least one of the listed authors had to be affiliated with the University of Jyväskylä. Previous publications of the JYU researchers were not included if their affiliation at the time of publication had been other than JYU.

The bibliometric data also had information about the Finnish Publication Forum classification (JUFO), which is used for assessing the quality of the publication channels (for more details, see 3.2.3. and 4.3.2.). The Publication Forum has been designed to be used at an institutional level and it should not be used to evaluate individual researchers, nor should it be used to evaluate the quality of the research across disciplines (Publication Forum 2018).

The essential parts of the data materials given to the evaluation units, coupled with the units' self-evaluations and draft development plans, were also provided to the international evaluation panel, albeit with some revisions based on the feedback received from the evaluation units. The evaluation units were also given a chance to provide the panel with supplementary data. The results of the WoS-based analyses were not reported to the panel in those few cases when the evaluation unit had produced less than 50 publications during the research evaluation period 2010–2017.

4.3.2. Limitations of the background material

The information on research personnel is partly incomplete because the University does not have comprehensive records of grant researchers, meaning recipients of personal research grants who conduct their research using the facilities of JYU. The reported grant researchers include only those individuals who have signed an agreement with the University, defining the terms and conditions under which the grant researcher can use the facilities of JYU. The agreement is not a work contract.

The information on external funding was retrieved from the SAP Financial accounting system. The reported funding covers only those transactions which have been managed by JYU. Some funding agencies pay grants directly to the grantees, and these transactions are not included in the reported sums.

All the data sets used for the bibliometric analyses have their own limitations. The reliability of the publication data in TUTKA has improved during the evaluation period. Prior to 2014, the entry of publication data in the system was conducted in a decentralised manner, and many researchers entered their publication information personally. Since 2014, the University Library has been responsible for data entry. The centralised service provided by the library has improved both the coverage and consistency of the publication data in TUTKA. Thus, the data from 2010–2013 are not

strictly comparable with the data from 2014–2017. Therefore, the background data for the units and the international evaluation panel were restricted to the period 2014–2017.

From the viewpoint of individual evaluation units, the national comparisons of the publication activity, based on Vipunen, were somewhat hampered because the discipline categories used in Vipunen match poorly with the academic structures of JYU.

Proper caution is required when interpreting the results of the bibliometric analyses. In particular, the incomplete coverage of the WoS database must be kept in mind (see Table 14). In general, the WoS database covers a clear minority of the publications in the humanities and social sciences, whereas a majority of publications in the natural sciences can be found in the database. These pronounced differences can be attributed to the different publication conventions in these fields. WoS is heavily centred on English-language journals, and Finnish-language publications, even when peer reviewed, are mostly missing from the database. Thus, national scientific publications as well as non-scholarly publications, which can be influential in terms of social impact, remain outside the WoS-based bibliometric analyses (Muhonen & Pölönen 2016). In addition, in many fields of the humanities and social sciences it is still a common practice to publish monographs or articles in edited volumes. Even though WoS has started to cover books as well, the coverage remains limited. All the described publication conventions differ from the practices prevailing in natural sciences, where publishing in English-language journals is the norm (e.g., Hicks 2004, Nederhof 2006).

Another reason for the discipline-specific differences in citing rates is linked to the citing conventions. For example, in many fields of the humanities and social sciences, books are more often cited than journal articles, whereas in the natural sciences journal articles receive most of the citations (Hicks 2004, Larivière et al. 2006, Nederhof 2006).

Both the publication and citing conventions seem to be changing. Researchers in the humanities and social sciences increasingly cite articles (Larivière et al. 2006) and publish in journals, even internationally (Nederhof 2006, Muhonen & Pölönen 2016). The changes, however, are not rapid and the traditional publication conventions still prevail. Although bibliometric analysis based on the WoS database may give the most comprehensive picture of the publication activities in the natural sciences, differences in the WoS coverage exist even within the discipline (as reviewed by Waltman 2016).

As the assessment of the research quality per se was not the objective of the present research evaluation exercise, only a limited number of indicators were used to approximate the quality and the scientific impact (see Appendix 2). The first indicator is the number of citations, which is widely used as a bibliometric indicator of quality. The assumption is that the higher the quality, the more citations the publication receives. This assumption and the use of citation counts for research evaluation, however, have been criticised (e.g., Seglen 1998, MacRoberts & MacRoberts 2018). The debate stems from the observations that other factors than the quality of the publication may affect the citation counts. For example, multi-authored papers, papers with authors from English-speaking countries, and papers reporting hypothesis-

supporting results tend to be among the most cited publications (Leimu & Koricheva 2005). The reputation of the author and, in particular, the reputation of the journal also affect how many citations an article receives (van Dalen & Henkens 2005). These examples show that the characteristics of both the author and the publication may cause a bias in citation counts. Furthermore, the number of citations is field dependent, since citation conventions vary widely between fields. For example, the rate at which a paper accumulates citations over time varies by discipline (Kokko & Sutherland 1999), generating differences that do not necessarily reflect quality differences.

The second reported indicator is the h-index, which defines the number of papers that have at least h citations each (Hirsch 2005). Thus, the h-index combines the quality (i.e. the number of citations) and the quantity (i.e. the number of publications) of the outputs. Originally, Hirsch developed the h-index to be used to compare scientific outputs of individual researchers. More recently, the h-index has been applied to measure the publication impact of research groups, faculties, universities, and even countries (Egghe 2010). We calculated the h-index using the WoS database, and as a consequence it has the same drawbacks as other indicators derived from WoS. As Hirsch (2005) has noted, the h-index varies across disciplines due to the differences in citation conventions, and thus, it should not be used to compare scientific fields. Literature reviews have listed various other disadvantages of the h-index, such as its dependence on the "scientific age" of authors, inclusion of self-citations, and its inability to distinguish the relative contribution of each co-author (Panaretos & Malesios 2009, Egghe 2010, Norris & Oppenheim 2010). One should also be aware of the fact that the h-indexes based on different databases may differ (Bar-Ilan 2008, Egghe 2010, Teixeira da Silva & Dobránszki 2018), potentially leading to disparate conclusions about the research impact.

Neither is the use of the JUFO rating, the third reported indicator, trouble free. JUFO includes those publication channels that are the most important ones in relation to Finnish researchers' scientific output (Publication Forum 2016), and therefore, the coverage of JUFO is not complete. As has already been discussed above (3.2.3.), the interpretation of publication trends based on JUFO should not be straightforward because the classification of individual publication channels for the period of 2012–2014 considerably differs from that for the years 2015–2018. This is mainly due to a classification update, which took place in 2014. In the 2012 classification scheme the quotas for rating were based on the number of publication series, whereas the 2015 classification system employed volume-based quotas (Pölönen & Ruth 2015). That is, the level 2 publications can constitute a maximum of 20% of the total number of publications in levels 1–3, and level 3 can constitute a maximum of 25% of the level 2 publication count. Consequently, the classification tightened in most disciplines, allowing a smaller number of series to be classified in levels 2 and 3 in comparison to the 2012 classification scheme. In addition, the classification of book publishers was also revised. The rating criteria was tightened but publishers could now be rated at level 3, something that had not been previously possible. The use of rating quotas has also been considered a challenge since not all qualified publication series can be included in the two highest levels (Pölönen & Ruth 2015). One should also recognise

that the relative number of publication channels in levels 2 and 3 varies by discipline (Publication Forum 2016).

Overall, the main conclusion drawn from the above review is that the selection of the background materials provided for the evaluation units and the international evaluation panel, the bibliometric analyses in particular, should not be used to rank the units in terms of their research performance or scientific impact. The vast differences in the coverage of publications in the WoS database alone signify that much of the scientific impact is bound to remain hidden in the fields with low coverage. Furthermore, the current bibliometric data do not necessarily indicate anything about the social impact of research, an aspect which is likely to gain increasing significance in research performance evaluation. Even though the reported indicators are one-sided, they serve as a good indication of the international scientific visibility of the unit's research activities.

Table 14. The coverage of the Web of Science database (%), JYU publications in 2014–2017.

Unit	2014	2015	2016	2017
Evaluation unit 1				
Dept of Social Sciences and Philosophy	9	12	16	15
Evaluation unit 2				
Dept of History and Ethnology	3	5	8	6
Dept of Music[1]	50	23	39	–
Dept of Music, Art and Culture Studies[1]	4	2	6	10
Evaluation unit 3				
Dept of Communication and Language Studies	11	18	18	19
Centre of Applied Language Studies	5	6	9	21
Evaluation unit 4				
Faculty of Sport and Health Sciences[2]	–	–	–	44
Dept of Biology of Physical Activity	66	69	53	–
Dept of Sport Sciences	22	22	35	–
Dept of Health Sciences	54	70	70	–
Evaluation unit 5				
Dept of Education	8	30	29	20
Dept of Teacher Education	14	20	20	20
Dept of Psychology	46	60	52	51
Finnish Institute for Educational Research	11	21	16	17
Evaluation unit 6				
Faculty of Information Technology[3]	0	33	9	29
Dept of Computer Science and Information Systems	12	24	26	–
Dept of Mathematical Information Technology	19	35	28	–
Evaluation unit 7				
Jyväskylä University School of Business and Economics	21	32	25	29
Evaluation unit 8				
Dept of Mathematics and Statistics	70	69	84	77
Evaluation unit 9				
Dept of Chemistry	86	78	85	88
Dept of Physics	68	72	76	69
Evaluation unit 10				
Dept of Biological and Environmental Science	75	62	62	63
Evaluation unit 11				
Kokkola University Consortium Chydenius	3	3	6	12

Notes: The coverage has been calculated by comparing the publication numbers in WoS and TUTKA.

[1] The Department of Music and the Department of Art and Culture Studies merged into a single department in 2017.

[2] Due to an administrative restructuring process, the Faculty of Sport and Health Sciences has had no departments starting in 2017.

[3] Due to an administrative restructuring process, the Faculty of Information Technology has had no departments starting in 2017.

5 MAIN FOCAL POINTS IN THE SELF-EVALUATION REPORTS

Each evaluation unit wrote a self-evaluation report using a template that was divided into 11 pre-defined topics (Appendix 1). As discussed in Chapter 2, five of these topics are considered to be of great importance in enhancing the quality and impact of the research. These are recruitment, career development and mobility, research collaboration, funding, and (research) leadership. The other topics covered by the template were profiling areas and emerging areas of research, academic culture, infrastructure, publication (support and practices), evaluation, and research-teaching linkages. The units were not expected to cover all the topics in detail but were invited to give a greater emphasis on those topics which they considered as being the most relevant ones from their perspective.

The self-evaluation reports will not be published. They were primarily prepared for the units' internal use, and they also assisted the evaluation panel members in understanding the reasoning behind the units' research development plans. This chapter briefly outlines the main points the units noted in their reports and which topics received less attention. The summary highlights the units' understanding of the major challenges as well as of the issues that need greater attention when promoting the quality of the research.

Recruitment. All units discussed recruitment and acknowledged that successful recruitment is imperative for conducting quality research. The units stated that they use open international calls to attract talented and innovative applicants and prefer candidates who would focus their research activities on the strategic core areas of the unit, two requirements that do not always match well to hiring the best possible candidates. Moreover, the units emphasised that they follow the principles of the University of Jyväskylä Equality Plan to ensure equal opportunities and the openness of the process, although many respondents of the 2017–2018 Teaching, Research and Career survey do not share this view. In addition to using international calls, some units also use headhunting to find talent, but in general, most units seem to face significant challenges in finding novel approaches to successful recruitment. On the contrary, they reported a number of problems that they see as obstacles to their recruitment efforts. The challenges of attracting the most talented academics, particularly international applicants, are plentiful: inflexible HR rules and regulations, the vagueness of the tenure track model, low salary levels, limited budgets and short-term funding outlook, remote geographic location, and limited job options for spouses, and the uncertain availability of English-language education at local schools.

Career development and mobility. The units acknowledged the importance of mobility for career and skills development, and academic mobility is encouraged. The focus in the self-evaluation reports, however, was almost completely on short-term (including conference participation) or longer but temporary visits. Thus, the units do not discuss how they (or if they should) promote academics' career development by supporting them in finding a job in another higher education institution, even though

it is obvious that in reality this type of support is given to academics, particularly to those in their early career stages. The units describe the funding options for research visits and report that travel grants awarded by faculties and departments are important in complementing the funding instruments provided by the University. Several units refer to the importance of systematic development discussions between researcher and their supervisors and call for a university-wide mentoring programme but they do not specify what type of career paths such practices should support.

Research collaboration. Research collaboration within the university and with other universities, both nationally and internationally, is clearly essential for the units, even though the units do not often explicitly state this in their self-evaluation reports. In many reports, the units primarily focus on listing their extensive sets of collaborators, both inside and outside academia. The dominating ethos is that establishing research collaboration, particularly outside the University, is largely an individual, researcher-centred accomplishment, even though in some cases collaboration can also be stimulated by a need to gain access to specific research infrastructure for the unit's research groups or to find collaborators possessing complementary skills and knowledge. Other important stimuli reported by the units are research networks and the University's profiling areas, often interdisciplinary, which could offer opportunities for establishing closer collaboration. The researcher-centred approach of research collaboration may explain why the self-evaluation reports do not contain very many ideas for future progress measures. In some reports, though, the units were contemplating the possibility of increasing international collaboration through, for example, an increasing volume of research visits, or by exploring possibilities for common research interests within the University.

Funding. Increasing, or at least maintaining the current level of external research funding is one of the most important focal points in almost every self-evaluation report, particularly since the units acknowledge that it is highly unlikely that core funding from the Ministry of Education and Culture will increase in the future. The units report that they have already been encouraging academics to apply for external funding and that they have received valuable support from the University's Research and Innovation Services. Even though a few units make the point that it poses a risk to rely increasingly on competitive external funding since the volume is likely to fluctuate heavily, nearly all units plan to boost their own support measures for their academics, all of whom are expected to apply for research funding or at least participate in proposal writing. The possible measures brought up by the units include internal informal review of applications, internal financial support for writing grant proposals, mentoring, and information sessions given by researchers who have been successful in obtaining external funding. Furthermore, a few units stated that when hiring new academic staff they put increasing emphasis on the candidates' likely potential in obtaining external competitive funding.

Research leadership. The issue of research leadership produced a meagre outcome in the self-evaluations. Many of the texts focused on describing the formal roles of the academics in the units' leadership positions. It seems obvious that the concept of research leadership was an ambiguous topic to address in the reports. Many units emphasised academic freedom and researchers' and/or research group leaders'

autonomy to define which should be the areas of strength in the research. The idea of shared leadership between the formal leadership and the other (senior) academics is clearly the preferred way of organising leadership within academia. Even though it had not been explicitly phrased, it seems that strong leaders are viewed as a potential threat to academic freedom, rather than as a group of actors who help to ensure a collaborative and vigorous research environment. The most explicit expectations were directed towards the leadership of some of those units that had recently been affected by structural reorganisation or were participating in some multidisciplinary profiling actions.

Publication strategy. Publication strategy received significant attention in the self-evaluation reports and all of the units set clear development goals. The units emphasised publishing in international, peer reviewed and high-impact publications, and particularly those units with a smaller than average share of co-authored publications set a goal for increasing publication collaboration both nationally and internationally. One of the driving forces behind the units' publication strategy is also the Ministry of Education and Culture funding model. The universities are rewarded much more for JUFO 2 and 3 level publications than for other publications. Those publications that have not received a JUFO rating between 1 and 3 contribute only a small amount to the core funding received by universities. The JUFO level, however, is not always the decisive factor when choosing the publication channel since several units, particularly in natural sciences, put a greater emphasis on publications' international scientific impact. The relative ratings in JUFO are not always in line with the impact factors of journals, which are viewed as significantly affecting international visibility. Several units also want to find a balance between increasing international publishing and maintaining national publishing since they feel that it is important to continue publishing nationally, and use the national languages, in particular when targeting the general public. Overall, the units' development goals are rather ambitious. They simultaneously wish to increase publishing in international peer-reviewed publications and/or gear their publication activities toward higher impact journals, increase publication collaboration both nationally and internationally, and continue publishing for the national public.

Many units also aim at fostering openness in science. Currently, the University requires researchers to self-archive all their publications in JYX, the University's digital repository. The units are aware of this requirement and they also encourage publishing in open access publication series, even though they fully realise the problems caused by high open access fees. Compared to open access publishing, the units have implemented to a much lesser degree the practices of making research data freely available. This may be partly due to the infrastructures for sharing data, which have been established relatively recently and are still under development, as well as restrictions related to the features of data.

Non-academic collaboration and public outreach activities. Most evaluation units extensively described their contacts and collaboration with non-academic organisations. The composition of collaboration partners varies by unit. Some units report active collaboration with industry and other companies. Many other units focus on collaboration with and provision of expert support to public bodies, both nationally

and locally (e.g., ministries, county councils, municipalities, educational institutions, and regional development organisations), and non-governmental organisations (e.g. foundations). Reported public outreach measures are also numerous. Several units emphasise the importance of disseminating their research results to the public and the significance of being involved in public discussions on current issues. The staff of the units take part in events that target the general public (e.g., Researchers' Night, the Finnish History Days), write newspaper articles, give interviews to the media, and are active in social media. Activities involving schools and their students include hosting school visits to JYU, producing teaching materials for schools, and offering continuing training for in-service teachers. Many units are also contributing to the activities of the University for the Third Age (*Ikääntyvien yliopisto*) and Children's University. The units emphasise the importance of continuing non-academic collaboration and public outreach activities, and some even aim at further developing them, but other improvement suggestions were rarely presented. A few units pointed out that their involvement in these measures is irregular and they were considering whether they should take a more active role in coordinating them more systematically, and consequently, prioritising the most relevant activities.

Academic culture. Practically all units emphasised their own activity in organising seminars, meetings, and other formal events in order to nurture interaction within the units, and in some cases, between disciplines. Additionally, informal events, such as coffee breaks and a variety of social events, offer an opportunity to build team spirit, disseminate good practices and establish collaboration between research groups. Early career academics are familiarised with responsible conduct of research, ethical principles, and legislation related to their research area by their group leaders and supervisors or by offering courses. Of all these actions, the informal ones appear to be the most commonly used form of orientation for newcomers. Many units emphasised the increasing importance of open science, and on top of their own activities, they wish for more support from the University or from the University of Jyväskylä Graduate School. In addition, a systematic mentoring programme organised by the University is on some units' wish list. Only a few units indicated that they acknowledge personnel's achievements by giving monetary rewards, providing flexibility in teaching obligations, or in general, celebrating the success of their academics in one way or another.

Evaluation and feedback practices. The units emphasised the role of the biennial development discussions required by the University's rules and practices. These discussions take place between individual researchers and their supervisors. During the discussions, researchers receive feedback on their performance from their supervisor, and together the two parties agree on future performance goals for the forthcoming two-year period. In addition, all active researchers receive a significant external feedback from, for example, reviewers who evaluate their grant proposals or manuscripts. Researchers also expose their research to evaluation when they give presentations at seminars and scientific conferences. In everyday interaction, colleagues and superiors provide informal feedback. At the unit level, the scientific advisory boards of the research centres or profiling areas can also give important feedback to both individual researchers and research groups.

Research–teaching linkage. The units emphasised that the linkage between research and teaching is already strong and they described three main activities supporting this integration. Firstly, explanations of research processes and methodologies, and how they have led to research findings, have been integrated into contact teaching. Secondly, students gain hand-on practice when conducting research as trainees or by writing their theses as members of a research group. Thirdly, scientific conferences organised by units offer students the opportunity to familiarise themselves with the scientific community as an attendee or as a volunteer assistant. Furthermore, doctoral students gain teaching experience, which may promote their career prospects. Although the research–teaching linkage was seen to be strong, the units are keen to continue developing new teaching methods to further strengthen the linkage. At the same time, the units widely recognise the challenge of maintaining a sound balance between research and teaching duties.

EXTERNAL PANEL REPORT

by

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6 EXTERNAL PANEL REPORT

6.1. Introduction

This report is the product of the University of Jyväskylä's research evaluation process for the period 2010–2017. The focus of the evaluation was 'on the attributes of the research environment that are conducive to producing research of high quality and renewal rather than on the research performance.' It had been agreed that there would be no grading of academic areas or of individual outputs but that the results and recommendations of the research evaluation would be utilised in the context of strategic research development. The main goal of the evaluation was to strengthen the quality of the research.

The initial internal process comprised of the production of a self-evaluation document (SAD) by each evaluation unit. Following the evaluation each unit would be expected produced an action plan, in negotiation with the University, setting out the key steps that the unit (and the University) need take to improve the quality of the research.

In parallel a multidisciplinary, international, panel was appointed, and a site visit arranged for September 2018.

The areas for evaluation comprised all the departments and independent institutes, in the University, that conduct research, and these were grouped into 11 evaluation units

1. Department of Social Sciences and Philosophy
2. Department of History and Ethnology & Department of Music, Art and Culture Studies
3. Department of Language and Communication Studies, including Centre for Applied Language Studies
4. Faculty of Sport and Health Sciences
5. Faculty of Education and Psychology, including Finnish Institute for Educational Research
6. Faculty of Information Technology
7. The Jyväskylä University School of Business and Economics
8. Department of Mathematics and Statistics
9. Department of Physics & Department of Chemistry (these are treated separately in the feedback in this report)
10. Department of Biological and Environmental Science
11. The Kokkola University Consortium Chydenius

The Panel was supported throughout by the University's research office and received all the SAD documents in advance, along with other background materials. The Panel then spent from the 05–10 September 2018 at the University. Each Faculty made a presentation, which covered the relevant evaluation unit and the Panel then met with the following:

- The Rector
- The Vice Rector
- Deans and Vice Deans
- Academic Staff (from each unit)
- Post-Doctoral Researchers and Doctoral students (from each unit)
- The Co-Ordinator of the Graduate School
- The Director of Strategic Planning and staff from the Research Office

The Panel split into sub-groups for the meetings with each evaluation unit; for each meeting a panel member was designated as the chair and was also responsible for feedback to the whole panel. The Panel met together each day to share views and to begin the process of outlining the form and content of the report. The panel was of the unanimous view that it was our role to act as 'critical friends', to offer any criticism constructively and to outline potential solutions whenever possible. After the visit each panel member took responsibility for drafting the section of the report on specific evaluation units and the Chair was responsible for the introduction, the general discussion and recommendations and for finalising the whole report. The panel worked extremely well together and felt that both the process and the production of this report had been an extremely positive, interesting and collaborative experience. We are grateful to the University of Jyväskylä and to everyone involved for being so welcoming and helpful, and especially to Anne Lyytinen, Kari Pitkänen and Timo Taskinen for looking after us so well.

Thank-you for the opportunity to work together on what we hope will prove to be a useful evaluation process.

6.2. Overview and general recommendations

6.2.1. Introduction

It will be clear from the individual reports that there are a number of recurring themes and issues arising from the evaluation and these will be covered in this section alongside some overarching issues. Some of the issues will be raised in each individual evaluation report, but we thought it best to introduce them here alongside our general recommendations.

While we consider the University of Jyväskylä to be a healthy and supportive research environment overall, there is, as is almost always the case, room for improvement. Below areas and strategies for improvement will be suggested, and stressed, in order to encourage the University to become the best it can be and to fulfil the aim of being an excellent environment in which to be a researcher and a University that produces excellent research. We realise that some matters are more challenging

and intransigent than others but regard it as our role to make recommendations on the basis of what, in our opinion, would produce excellence in the short, medium and longer term across all areas of research strength. It is then for the University to decide which of these are feasible and what the timescales can/should be in each case.

6.2.2. Research support and administration

We were very impressed with the generally very positive view of the support that academics receive from the Research office for the process of developing and submitting applications for research funding – in our experience this level of satisfaction is unusual. However, there was more criticism of the support available post award. Many of the academics we spoke to said that, as PIs, they spent far too much time on budgets and administration and that the situation had worsened with the greater centralization of the professional service departments. While we understand the desire for greater professionalization of services and the need for more centralization if this is to be fully realized, we would recommend that some thought is given as to whether some more support for research is needed, either centrally or possibly at faculty level, in order to ensure that academics maximise the time that they can spend on actually carrying out research and publishing from it. It is our view that it is important to have an adequate level of general administrative support at Faculty/Departmental level in order to ensure the smooth running of both research and teaching and believe that this can be achieved without returning to a locally managed administrative system.

We would also wish to point out that there is often a view that research fields outside of the Sciences, which don't need 'big kit', only have minimal support needs. Many areas, however, do need technical, statistical and data management support as well as having the administrative needs raised above. We suggest that the University conducts an 'audit 'of such needs and assesses how they can be better, and most efficiently, met through both internal and external funding.

6.2.3. Staffing and recruitment

There was a great deal of discussion about staffing levels in the sessions we held. While we understand the historical differences between Finnish Universities and those elsewhere, especially the UK, we see the changes in the sector following the University reform in Finland which was triggered by legislation in 2009, as positive with regard to opening up options for creating an academic career structure which is fit for purpose. The University of Jyväskylä, in our opinion, has a real opportunity to lead the way in this regard because it is not a juggernaut, which would be very difficult to turnaround and because there appears to be a will at senior management level to make further changes.

While we applaud the development of a tenure track system it seems not yet to have been fully realised and there is some confusion, across the University about what is actually possible. It is also the case that if tenure track posts are too tightly linked with the Internationalization strategy then problems will arise in relation to existing staff who have achieved the same level. We would recommend that the University

undertakes a thorough staffing audit in order to ascertain the necessary levels to deliver current teaching and research, alongside a review of current staff costs – by the latter we mean all teaching and research staff whatever the form of their contract. We would then recommend that the University begins to move to a position whereby it employs as many staff as is feasible on full-time permanent 'research and teaching' style contracts. This would mean moving away from the current confusion between lecturers, teaching only staff (some of whom do research) and those on research contracts (many of whom teach). The aim would be to have the majority of academics on mixed contracts, with 'teaching only' contracts only where this is necessary to the delivery of a programme – for example where there is a specific need for professional skills.

We recommend that the University sets out a clear nomenclature for academic staff that is tied to their level of experience and attainment. These positions would be either permanent, potentially permanent (tenure track), or time limited - one, three or five years, but with the option of becoming permanent depending on budgets and levels of achievement.

We have no strong view about whether the structure should be

Lecturer, Senior Lecturer, Professor

Or

Assistant Professor, Associate Professor, Full Professor

In our view it should be possible to be full or part-time at all levels and on a temporary contract only at level one and only for a limited time period – say five years.

It would also be necessary to create parallel grades of Researcher and Senior Researcher or Research Fellow and Senior Research fellow, or some such, for those employed fully on externally funded research and for the route to Full Professor to be open to these researchers.

This staffing profile would relate to the baseline amount of teaching to be undertaken with time factored in for the development of research funding applications in order to increase success rates. If it were the case that most academics, most of the time undertook a mixture of research and teaching then this would be more equitable and teaching loads would vary in relation to whether research time was covered from other funding sources. Having more staff on more secure contracts would make it easier to plan and for teaching to be covered by other colleagues when individuals were in receipt of external research awards. There is no simple common equation in relation to research and teaching across disciplines as the balance between contact time and student led learning, for undergraduates, varies greatly between laboratory sciences and the humanities. It is also very different in relation to the supervision of graduate students, between disciplines in which the students are part of a team and contribute to the research, and those where supervising Doctoral students actually takes time away from an academic's own more individual research project. It is inevitable then that Departments/Schools have differing views about the work load balance between teaching and research and there is not easy answer which produces a standard workload across the board. Engaging staff groups within Departments/Schools in exploring better ways of managing workloads is a good place

to start and will be met with enthusiasm if it is seen as having the potential to lead to appropriate staffing levels and career paths.

In this wider context a limit should be set on the amount of teaching that is undertaken by funded Doctoral students and we would suggest that Academy of Finland guidelines are adopted for all Doctoral students, regardless of the source of their funding, and that Post-Doctoral researchers attached to research projects should only undertake the amount of teaching permitted by the funding body. It is of course important that career young academics gain a range of teaching experience in order to develop their portfolio of skills. Post-Doctoral Researchers who are not attached a specific funded research project, but who are undertaking what is often a substantial amount of teaching are something of a misnomer. We would recommend that they are called lecturers or assistant professors (whichever is preferable), and that they have clear temporary contracts with a view to longer term or permanents positions in the future.

With regard to recruitment processes, for academic staff, we feel that it is very important that the University is seen to have fully transparent search, short -listing and interview policies and practices linked to clear job specifications. There should be a University wide agreed format and training for selection panels. The relevant Dean should be involved to ensure that he/she has an overview of research areas and fit. For posts below full professor the Dean should be the chair wherever possible. For professorial posts selection panels should be chaired by the Rector or the Vice Rector for Research, but with the involvement of the Dean. The relevant academic areas should also always be represented.

We realise that development involves a number of different areas of the University and that it would take some time to be fully realised, but it would position JYU as a very attractive place to work and enable the retention and recruitment of the very best staff nationally alongside encouraging international recruitment. It would also enable the University to develop a clear equality policy with regard to staffing.

6.2.4. Support for Doctoral students and the development of the Graduate School

The Doctoral students whom we met were in the main engaged and enthusiastic, but many of them were also frustrated in relation to their struggles to access and maintain the necessary levels of funding. We have some concerns about the ways in which the different funding arrangements seem to produce inequities in relation to status, availability of teaching, and access to training. We would recommend that these issues are explored further with Doctoral candidates across the University with a view to ensuring equality of treatment wherever this is possible.

We admit that we were somewhat confused about the nature of the Graduate School and believe that this is in some measure because many colleagues at JYU are also either confused themselves or are not really engaged with it. We understand that officially the JYU Graduate School operates at three levels: University, Faculty and School/Department. However, we strongly recommend that JYU raises the status of the University level Graduate School and develops it as an organisation and a community which will support doctoral candidates, enhance the internationalization

strategy and create opportunities for inter and multi-disciplinary research. Such a graduate school would have a more expanded responsibility, than is currently the case, for postgraduate training beyond the content of the PhD and the need for discipline-based development. This would create greater opportunities for PhD students to develop essential personal and professional skills including academic management and leadership as well as organisational and time management, innovation and entrepreneurship and also those skills needed for inter and multi-disciplinary research. It could also go further in encouraging the development of language skills. The Faculty Graduate school model is probably better suited to a larger University and while we accept that some useful support and training fro PhD students can, and should, be offered at Faculty level we think that JYU is missing the opportunities afforded by a relatively small and compact campus University to develop, through a genuinely University wide Graduate School, the next generation of academics and researchers as well rounded interdisciplinary thinkers with a strong sense of the importance of collegiality, of networking across disciplines, of understanding of the importance of a wide range of disciplinary approaches and methodologies and with a commitment to innovation and impact. Such a School would need to be led by a senior academic – a Postgraduate Dean or Director and could also act as a focus for international academics and visitors by offering an English language space for seminars and events.

In this context we also suggest that the University develops a Research Methods Masters Programme, with pathways in the Social Sciences and Humanities, and including courses that can be taken individually by students in these disciplines, and also in STEM disciplines as well (see the report on the Department of Social Sciences and Philosophy). This would be attractive to international students and would be a strong preparation for Doctoral work for students not attached to a wider research project.

Should the University decide to re think its approach to Graduate Schools then there are many good models to explore – some of which undertake all of the administration relating to Doctoral students as well as the training, it is for the University to choose which model fits best, but what is crucial is that there is a physical location and the opportunity to develop a strong (international and interdisciplinary) research community.

6.2.5. Internationalization

We appreciate that the senior management of the University is committed to a process of internationalization and note that in many areas and especially across the STEM subjects this commitment is largely shared. However, we noted a sense of disbelief in the feasibility of the strategy in some areas and sometimes a measure of reluctance as well. This latter is largely defensive with regard to the possibility of highly qualified, hard-working and valued colleagues being rejected in favour of an international recruit. This is understandable – it seems as though the goal posts are being moved just when more tenure track opportunities seem to be within reach and if the University wants to be a really good place to work then this development needs to be

handled sensitively. In our opinion, developing a clearer career structure for all academic staff would be a major step towards achieving this and would ensure greater engagement with the internationalization strategy overall.

We were given a number of reasons why international recruitment is a significant challenge for JYU, but we are not persuaded that these are insurmountable. The language issue is, of course, significant as it is not feasible to expect that many potential international recruits will arrive as competent Finnish speakers. While some might be willing to learn the likelihood of them being able to teach in Finnish even in the medium term is not high. This has implications for equity in relation to workloads. It is important that there is sufficient teaching in English extant, or under development, if the University is to avoid a hierarchy with regard to Finnish speakers undertaking most of the teaching and internationally recruited colleagues by default having more time for research. We suggest that analysis is undertaken of other European Universities where international recruitment has been successful in order to better understand how workloads can be balanced. We appreciate that while English is the universal language of science, the language issue is much more of a challenge in the Humanities and Social Sciences.

We suggest that there is a conversation across the University about the positive aspects of Internationalization and that this is defined as much more than the recruitment of a certain percentage of academics from around the world. Internationalization is not simply about bringing people in, but about changing the University from the inside. This entails significant decisions about whether the language of administration, services and communications should be English or at least English as well as Finnish. The website, including the intranet, information on notice boards, the signage in buildings and around the campus are all candidates for ensuring that the University is welcoming too, and navigable by, non-Finnish speakers. Supporting English language improvement as well as conducting seminars and symposia and holding cultural events in English is also part of internationalizing the University. This process needs to be developed in such a way as to be of benefit to existing colleagues both academics and those in professional services.

The second major reason that we were given for the likely difficulty of recruiting non-Finns was the location - a small town in the middle of a relatively unpopulated country, a long way from the capital city. Some of us work or have worked in small places at a distance from any metropolis and therefore understand the benefits that this can offer. The quality of the Finnish Education system, and of its welfare and health provision, (despite the current issues) is potentially very attractive, as is the natural environment not to mention the work environment on what is an extremely attractive campus. It really isn't so far to Helsinki and much of Europe is accessible as well. While we concede that it might be difficult to attract a full-professor from Yale or the LSE, for younger academics the benefits might well outweigh the challenges. When it comes to recruiting more senior people there are alternatives to the standard process which could be considered, if they haven't been already. The first is to establish a far greater number of visiting professorships for three to five years with flexible arrangements for time spent at JYU. These should have clear requirements and actual or potential research links. Secondly, by encouraging some of these visitors to come

for longer periods or to stay on a more permanent basis. Thirdly by inviting people to come for one or two years on leave of absence, from their institutions, with a view to a permanent or 50:50 arrangement. Fourthly, specifically seeking academics who have retired or who are close to retirement, and who might come for one or two years or more on a fractional basis. In this latter case, especially, it is important to have clear expectations about how they can support research development in order to ensure a strong legacy.

While many of the academics we spoke to have active, research led, international networks and make regular visits to Universities outside Finland we also encountered a different position, which is that it is often difficult to travel due to lack of funding and also because of teaching, family and other commitments. These issues are real and need to be addressed. The University would be wise to find a way of enabling staff to travel for short periods of time to make initial contacts and to ensure that these trips are well supported, in terms of teaching cover and funding, so that they are of maximum benefit and not just an extra burden. This means recognising that different parts of the University are in different places with regard to internationalization and thinking about creating fora for exchanging ideas and support across the institution.

6.2.6. Profiling, multi/interdisciplinarity and crosscutting themes

We heard a good deal, and a range of opinions, about national research profiling in Finland but we understand that it is unlikely that this process will continue after the current cycle. It will be important to evaluate the effect of the process in order to understand the positive outcomes of the focusing research, but also in order to explore the opportunity costs and to consider where some rebalancing might be necessary.

Many of the academic areas at JYU pride themselves on their multi/interdisciplinarity. Clearly genuinely interdisciplinary work is occurring across the science departments, but it is our view that elsewhere, for example, in Sports and Health Science, there are opportunities which have not yet been taken up. Researchers in the Social Sciences presented themselves as undertaking both multi and interdisciplinary research, but we felt that this could be developed further. We would stress however, that it is important, with regard to the latter, to ensure that all the disciplines have a strong base from which they can be refreshed as this is what produces really exciting work at the interfaces.

It is also important not to confuse organisational multi-disciplinarity - i.e. the bringing together of more or less cognate fields for structural reasons – with the conditions necessary for producing excellent research which genuinely draws on a number of disciplines. In this context it is important to establish and enable fora for discussion, horizon scanning for research opportunities and seed money for colleagues to spend time together exchanging ideas and coming to an understanding of different ways of working, theoretically, methodologically and practically. Good cross-disciplinary work is challenging, it requires support and leadership if a lowest common denominator approach is to be avoided. JYU has a real advantage here being a relatively small campus University, with some excellent existing, and potential synergies, and a lot of good will towards working in this way. In this context we heard

WISDOM mentioned on a number of occasions, but we remain unclear about exactly what form it is expected to take, or what the drivers are. In principle we would be supportive of such an apparently bottom up cross-disciplinary initiative, but it seems to be in need of leadership and greater focus.

We were introduced to the idea of 'Well-being' as a potential major research theme for the University. In our view this presents an exciting possibility, which has a great deal of potential for both cross-cutting and single discipline, research as well as for action research and evaluation programmes in relation to public services in the region. We would recommend that a framework is created, and an initial timescale put in place for the development of work in this area. The right leadership will be very important and while the commitment of the Rector, the senior team and the Deans is key, it will also be necessary to bring together academic thought leaders from across the University if the overall programme of work is to be academically strong and have the necessary impact.

6.2.7. Assessment of research outputs

We understand that currently the University (and the Ministry and the Academy of Finland) operate a ranking system for Journals and expectations about staff outputs are set in this context and that this in turn is linked to funding. While it is our view that such bibliometrics are often flawed measures, and more problematic in some disciplines than others and while it is the case in the UK that such metrics have been resisted in research assessment exercises for Social Science and Humanities disciplines, we also understand the limits of what we can realistically recommend. However, over recent weeks the debate about Science Europe's PlanS, which the Academy of Finland was an early signatory to, has made it clear that the use of journal hierarchies and impact factors is likely to need to be re thought, at least in the short to medium term, if Plan S comes into effect (intended to be in 2020). Plan S decrees that all publications from 'publically funded' research must be open access immediately on publication and must be in fully open access outlets not in hybrid journals. Most of the rest of the world, and especially the USA, is showing little interest in going down this kind of OA route in the near future which means that many of the high impact English language journals will not be acceptable outlets for European, publically funded research. European research will be published in OA journals, which, in the main, do not have high impact factors. This plan is problematic in many ways, but it does offer an opportunity for the University to explore alternative ways of assessing the value of research and perhaps taking the lead, if it is not already doing so in the national debate. One suggestion would be that the University explores making a commitment to signing the DORA agreement.

It was also clear to us that there needed to be more clarity about the need for some areas of research to be published in outlets which are accessible to the relevant professionals in Finnish and for this to be valued as part of impact and the public intellectual function.

6.2.8. Research impact

There is much discussion of the importance of both understanding and documenting the impact of research, across Europe, with the intention of assessing the value of public investment, as well as increasing understanding of how research is utilised. This is most highly developed in the UK where, in the 2021 Research Excellence Framework (REF) outcomes impact will account for 25% of the funding allocation. When impact assessment was introduced for REF 2014 there was a great deal of concern in the academic community, perhaps especially in the Social Sciences and Humanities. It was felt that impact would be hard to assess fairly and that it also that research often took a long time to show any impact – this latter was allowed for in the assessment. There was also concern that more theoretical areas would not do well and that there would be a strong focus on economic impact (this focus was softened and for 2021 it is very clear that broad social impact is valued as much as any effect on business or the economy). The UK Academic community has learnt a good deal in the process and there was much less concern when the percentage allocated to Impact in 2021 was increased from 20% in 2014 to 25%. There are still concerns of course, but the outcome of the 2014 assessment was reassuring in that the Humanities and Social Sciences did rather well overall. Indeed, evaluation has ascertained that 84% of all impact case studies submitted, across all disciplines had a social science element. This is background to the strong likelihood that there will be increased pressure to monitor the impact of publicly funded research in other European countries (including Finland). In this context it is our view that in this context JYU has a significant opportunity. Much of the research undertaken across the University has obvious social, cultural and/or economic impact and developing a system for collecting this information and publicising it could be to the advantage of the University overall and also be utilized in support of funding applications.

6.2.9. Strategic leadership

The University is clearly led by a strategic vision from the top and this evaluation is part of that process. We were impressed by the Rector's strong desire for the University to be the best it can be, while retaining its identity and through developing an increased sense of engagement at all levels in the planning, organisation and execution of research. However, leadership from the top is only one dimension. We would suggest that good strategic research leadership can occur at all levels if colleagues believe that their ideas and suggestions will be taken seriously. Enabling this is a matter for a university-wide conversation about the communication of ideas and the best ways to ensure that structures and processes are flexible and gatekeepers responsive. In order to facilitate this way of thinking about research it is crucial that there is a clear route through the organisation. Currently there seems to be a lack of connection, in relation to the development of strategy, on the one hand by the Vice Rector with the Vice Deans for Research, and on the other discussion and decision-making between the top team and the Deans. In some contexts, this division of labour may work well if the Dean and Vice Dean have the same strategic vision, but this is by

no means guaranteed. A Dean who really wants to lead her or his Faculty is likely to want to lead in relation to research so more thought needs to be given to the relationship between the Vice Rector, for research, and the leadership of the Faculties.

We understand that there has been some leadership training for Deans (and others?) but would recommend that this is an ongoing process and that the University might consider developing a strong relationship with a good and innovative training organisation who will be able to work not only with those who are currently in strong positions, but also with future leaders. We detected anxiety in some areas about succession and succession planning and suggest that this is an area, which if developed now will pay dividends in the future.

In this context we would suggest that in the (relatively) new organisational structure it is possible for Professors to feel that they do not have a clear role, this is less likely to be the case if they are leading a significant research group, but in other instances if they do not have a clear leadership or management role there may be a tendency to disengage from the important task of intellectual leadership and leadership of the discipline and focus only on personal research rewards. If this happens there is a loss to the University of knowledge and experience and a loss to individuals of the satisfaction that comes from engaging with and supporting colleagues and exercising leadership both within the University and in the public sphere. We suggest that the University considers ways in which the role of Professors can be further developed.

6.2.10. Concluding comments

A great deal of work has gone into the production of documents for this evaluation and also into producing the feedback in relation to this report. In Panel's view it is important, therefore, to maximise the benefit from the process by ensuring that, across the University, there is a clear timescale for reflection on both the process and its potential outcomes once the action plans have been drawn up. We would be very willing to take up the proposal that there should be some further engagement with members of the panel in this reflection process order to explore what has been achieved and to understand what, if any, are the barriers. We would also welcome further discussion about our suggestions and recommendations.

6.3. Reports on each evaluation unit

6.3.1. Department of Social Sciences and Philosophy

Are the actions well defined and do they have a clear objective?
Is the choice of proposed actions justifiable in the light of the background data?
Is the choice of proposed actions likely to lead to the target(s)?
Overall the answer to these questions is yes. The Department is successful and in relation to the development of research, this success seems likely to continue and there is support in place for this. The academic culture is strong and collegial and many of the staff have good networks within and outwith Finland. There has been significant success in relation to external funding and staff are to be congratulated for this. However, we feel that the Department needs to think longer term and to do some horizon scanning in relation to developing research areas and making even more links across disciplines. This is not a matter of negating individual research interests in order to fit with externally driven priorities, but rather to use the methods of social science to ensure that they can develop research in new and evolving areas of importance for society, while retaining their current key themes.

Background
Overall there was a positive view of the University and of the Department within it, but with an apparently less strong sense of belonging within the new Faculty, except in relation to the Crises research. We were told that the previous vision for the University was very focussed on the Natural Sciences but that now it was broader and that the Department felt involved in the current vision and strategy. The Department is described as collegial with research seminars, discussion and peer support. The longstanding feminist ethos has created a commitment to developing women's careers, but also to ensuring that it is a good place to work for both women and men. While the SAD describes the aspects and issues for the Department very clearly and sets out the challenges that it faces the overall impression is somewhat downbeat. There is a strong emphasis on researcher autonomy on the one hand and a number of criticisms of, and suggestions for, changing University practices on the other there is little strong sense of the role that the Department might play in bringing these changes about. Given that this is a strong Department with members who have excellent skills in understanding organisations, interactions and change we feel that it could be more proactive and offer leadership in finding ways to improve practices and processes. The Department considers itself to be multi and inter disciplinary and staff feel positive about this. This is important in relation to Philosophy as it would more commonly be in a Humanities context but was thought to fit well with the rest of the Department in this case. In relation to leadership they suggested that there should be more support for Senior Researchers to move into their first leadership role and suggested that they could begin to develop this within the department. We would endorse this desire and its development at all levels in the University.

There was a strong sense of the need to exercise, what they referred to, as academic freedom in relation to research but they did not seem to think this was in anyway under threat. We did wonder whether there might be a classic tension here between an individualistic definition of academic freedom to pursue research ideas and the development of a strong strategy to ensure that larger and more long-term projects can be developed. What is important in the social sciences that there is the freedom to try new ideas, develop new theory and explore new areas of enquiry and the possibility of thinking big and long term, in order to explore both continuities and changes. It is crucial that both the Department and the University have strategies to ensure that both these approaches are supported. This is a strong Department overall, in a University which supports social science and we would encourage the Department draw strength from this and perhaps be a little more proactive in taking a lead.

Staffing

The staffing structure has changed somewhat in recent years with 13 professors retiring during the evaluation period. There has been replacement with a reduction from 18.6 in 2013 to 14.9 in 2017 an overall staff decline of 20%. This seems to be in large part because Doctoral students on contracts are employed at the Faculty level. However, the Department has managed to turn a number of temporary positions into permanent posts and this is something to be encouraged.

The Department is actively involved in, and committed to, open recruitment but they think that the location of the University, the difficulties entailed in relation to employment for partners and the availability of English language schooling militates against attracting international scholars. They are also concerned about the effect on the division of labour in the Department if they recruit non-Finnish speakers. While we understand these challenges, we do not feel that they are insurmountable and suggest that the Department's leaders explore practices in other departments, both inside the University and elsewhere, which have been successful. We also suggest that they consider developing an International Masters Programme and extending their contribution to teaching and training for Doctoral students. There are some concerns that while the gender balance has been quite good, this may be tipping because of the lack of long-term funding which may mean that women take a career break but have no post to return to. There was also concern about the expectation that academics should undertake longer international visits meant extra pressures on those with children. There is also the issue of academics getting stuck at Senior Lecturer level. While they are positive about the fact that University has introduced tenure track posts which enable early career researchers to progress they now have to compete in open recruitment for the small number of Professorships which are available. This would be resolved if the University took the bold step of appointing people to Chairs once they become eligible rather than waiting for an existing chair to become vacant.

Development for career young academics

In general, the Post Docs and Graduate Students to whom we spoke seem content with the Department, with the work that they were doing and with the University more

generally. However, the Post Docs felt themselves to be overloaded with teaching, this did seem to depend on the kind of contract that they were on and there did seem to be some confusion about what was expected and what they were obliged to do. They were concerned about having short contracts and thought that more tenure track positions and more internal University funding would help. It seems to us that some thought needs to be given to career planning and to training and mentoring for early career academics. This is an issue which is not confined to this Department, but those we spoke to mentioned feeling rather alone when it came to making decisions and wanted more support and advice with plans and choices. When asked what would make their lives better the main response was 'longer contracts'.

The graduate students seemed to be a little unclear about the role of the Graduate School and its relationship to the Department/Faculty. They knew that there were some compulsory courses but seemed to have no strong sense of belonging to anything wider or to have any sense of the value of making connections across the University. They felt strongly that there should be greater equality of treatment between those who were funded on grants or by the University and those who were funded in other ways and complained that University funded students got priority when it came the allocation of teaching and access to the training course for new teachers. They were all writing their doctorates as articles and found the publishing expectations challenging. We certainly sympathised with them, as it is a significant challenge to publish academic articles in the middle of a thesis especially if you have qualitative data which needs to be thoroughly analysed. They know that there are differing expectations about how many articles constituted a PhD, and how many had to be published/accepted, in different disciplines, but not what the rationale was for this and we would suggest that this should be transparent.

Teaching and research relationship

Many of the senior staff that we met made a strong case for a better balance between teaching, research and administration and felt that they were doing increasing amounts of the latter. The plea was for more local administrative support for both teaching and research activities. They have developed a new curriculum in response to being 'told' to reduce the number of courses on offer, but they said that they spend too much time on developing and reporting. They feel that they are 'not selfish enough in relation to teaching' and we would suggest that they take strategic look at their teaching load overall to see if there are any courses which are surplus to requirements, and also whether patterns of teaching can be further modified in order to enable loading in one semester rather than across two. As this would create a better teaching and research balance allowing more concentrated time for research and for funding applications. They state that they are committed to ensuring academics at all career stages have time for research and also that with four courses per year that teaching loads are lower than in other Finnish Universities – but could they be more flexible still? If more space for research could be created by being more strategic about what and when they teach, in order to create more flexibility to spend time on funding applications and publications, without compromising teaching quality, then this would make the Department an even more attractive place to work.

Research funding and research support

The Department has clearly been successful in attracting external funding with a steady increase in recent years. They currently host an Academy of Finland CoE on Ageing and Care as well as a number of other Academy of Finland and ERC awards. They are also actively involved in the Crises Redefined profiling area and have a multidisciplinary profiling area application in submission in the area of 'Active Aging'.

The academics are very happy with the pre-award support that they receive, although they feel that there is a real need for more support for Post Docs making their first funding application. The view is that the move to greater centralisation had meant that, post award, PIs spent too much time on budgets and administration and they would very much appreciate some dedicated support.

We had some discussion about research impact and suggested that they might explore a division of labour here as some people may be better at developing impact from research and others at ensuring international publications.

Publication

We did not get a sense of a strong departmental publishing strategy, but rather a more laissez faire position which, while it seemed to be appreciated, may not be helping staff to develop their own publication strategies and timetables. We have some concerns about the pressure to publish in ranked international journals as, in the social sciences in some sub fields, the best place to publish to have an impact on the field is in a more specialist journal. These will inevitably have lower impact factors and many relevant journals are not in SCOPUS or Web of Science. As is pointed out in the SAD citation indices don't work well for the Social Sciences (or the Humanities), both because of the small sub fields as mentioned above, and because research takes longer to have an impact. Currently the Department is walking a tightrope between encouraging publication in the most highly ranked journals, even though they believe the system to be flawed, and trying not to interfere with individual publication plans.

Of course, many researchers publish monographs in the Social Sciences, especially where qualitative data requires length to fully represent both the data and the analysis. This practice will inevitably be affected by the PlanS Open Access proposals and the University and the Department will have to consider how to fund this, especially for early career colleagues.

Publishing is an issue in need of wider discussion in the University, and beyond, but meanwhile the Department needs to develop a strategy to support staff at all levels to publish more in English in a wide range of journals, as well as continuing to publish in Finnish. In this context the issue of translation was raised, and it was suggested that there should be more central University support for publishing in English. It may also be necessary for the University to allocate more central support for open access fees for those who do not currently hold awards with budget allocations for this.

Multi/interdisciplinarity

There is a strong commitment to cross disciplinary working in the Department; it is central to what they do. However, they did raise an issue that they feel challenges this

commitment, which is that all Professorial positions are disciplinary. There was a suggestion that some new tenure track positions should embrace the interdisciplinarity of the Department and the 'big research themes'. We think that this commitment to interdisciplinary working is laudable but would make two comments. First that, while it does extend outside to the Department this could be further developed especially in relation to the 'Wellbeing' theme. Secondly, we feel that it is also important to maintain disciplinary strengths as this means that there will continue to be a strong theoretical and methodological basis from which to move out to develop even more cross and inter disciplinary projects.

Internationalization

This was felt to be something of a challenge as, while they publish in international journals and have a network of international collaborators, they do feel strongly that they need to continue to publish in Finnish to a significant extent because of the nature of the research and the relationship of some of it to policy and practice. They feel that there is an expectation, which they want to fulfil, to be public intellectuals and this entails communicating ideas and research findings in Finnish to a Finnish audience. When it came to recruiting international staff there was a view that people would not be drawn to JYU because it is a small place in the middle of Finland. There was also a view that the need to learn Finnish was major barrier. There was also discussion of the problem of those currently on temporary contracts having to compete with international candidates for tenure track positions. If staff were promoted once they were eligible, especially to professorships, this would raise the international profile of the social sciences at Jyväskylä, along with increasing funding opportunities. It is a disservice to the quality of the research if colleagues are not viewed positively because they are not professors when they would have been promoted to this level in equivalent Universities elsewhere. We would also suggest that the Department consider making some strategic visiting appointments, both short and longer term, in order to bring in new people without the challenges discussed above. This would also provide contexts for sustained connections with Departments elsewhere so that these visits can be reciprocated.

One area for consideration would be the development of an international Masters Programme in Research Methods with courses which could also serve as research training units for Doctoral students across the University, which would make it viable in the short term. The Department has the skills to do this and it could help them to internationalize both their teaching and recruitment.

Conclusions

In the SAD the Department is described as being at the heart of the University, which is where the social sciences should be. However, despite being successful in research terms or perhaps because of it, and therefore with little time for anything else, we have a sense of staff feeling somewhat beleaguered by the University's demands. We feel that the Department is not being as proactive as perhaps it might be in leading initiatives to create links across the University and to shape the overall research strategy. Of course, we may be wrong about this, but the SAD gives the impression of

the Department wishing to be left alone to get on with its research. We fully appreciate that, as in Universities everywhere, the administrative burdens on staff are increasing, but we would hope that this is not getting in the way of critical engagement with the 'big ideas' being developed in other areas of the University, which would benefit from social science input. Perhaps the answer here is to consider some joint appointments and joint visiting academics to enable this development without further burdening staff to the detriment of existing and currently planned research.

6.3.2. Department of History and Ethnology & Department of Music, Art and Culture Studies

Are the actions well defined and do they have a clear objective?
HELA comprises the disciplines of History and Ethnology/Anthropology, each with several sub disciplines. In past years it was partner in three Centres of Excellence, revealing its interdisciplinary approach. A new externally funded project has started modeling the Finnish Economy, 1500–2020. The present research clusters are Comparative Political Cultures, Postwar Studies, Health and Well-being, Gender Studies, Poverty and Development, Economic History and Strategy and Early Modern Morals. Key profile area is the study of societal crises and changes in a comparative, long-term perspective. This profile has developed in coordination with JYU's core field Languages, Culture and Communities in Global Change Processes and the Faculty's profiling area Crises Redefined. HELA has identified a list of items to be implemented in the coming period in the area of research, funding and public outreach. First, the areas mentioned will be further developed. Secondly, the amount of external research funding needs to increase, to create higher staff levels and the means to deliver high quality publications. Many grant applications are underway. Thirdly, public outreach will be further increased. However, plans about international cooperation and connecting to (inter) national partners/consortia are less well articulated.

MUTKU is a multidisciplinary department covering a diverse range of fields linked to art, music and culture studies. MUTKU has a strong record in research excellence, having hosted the Centre of Excellence in Interdisciplinary Music Research and now being involved in the Centre of Excellence for Game Studies. This department has been and is an active participant in several university profiling areas including Brain changes across the life span, Physical activity, health and well being. It also boasts an international reputation in cognitive musicology. Its external grant income is impressive. The proposed actions to achieve their objective are clearly defined and ambitious, although not unrealistic given their past performance.

Is the choice of proposed actions justifiable in the light of the background data?
All in all, both departments provided a clear and convincing overview of proposed actions. Both departments want to place more emphasis on systematic career planning, including mobility, particularly for senior staff and post-doctoral scholars, through careful mentoring by senior members of staff. A start has been made with tenure track appointments linked to JYU core fields and profiling areas. A more systematic bottom-

up periodic assessment of the research clusters and research groups is planned, but it is not yet clear how this will be established.

Although there is a high level of international cooperation, many contacts depend on individual initiatives, especially in HELA. Plans are being made to develop partnerships on a more structural level. Non-academic collaborations seem well established. HELA boasts a long tradition of teacher training and activities for Finnish foundations and societies. A more focused proposition and prioritization is suggested.

MUTKU is a very recent merging of various departments/units and is therefore still in the process of finalizing joint actions. The discussions with staff revealed a strong willingness to develop joint ventures in research capitalizing on the strengths of the former separate units. However, given the strong past performances in the individual disciplines, especially Music, the review team is confident that joined actions will further strengthen an already strong research performance.

Some additional factors are seen by the Departments as mitigating against identified actions to improve research efficiency

- Barriers (presumably administrative) hinder inter-departmental and inter-faculty research collaboration.
- Clearer guidelines are needed from the Faculty and University about data protection and the proper handling of research data in general.
- Funding application procedures could be supported more systematically (p. 10)

Is the choice of proposed actions likely to lead to the target(s)?
Below a critical overview of points that came out of the interviews

Staffing
Concerning academic appointments, uncertainty the about exact criteria for tenure track recruitment is annoying; especially with regard to researchers who have had a series of fixed term contracts and have almost reached professorial level in their personal attainment. Different vintages of TT arrangements lead to confusion. Concerning non-academic staff, it is important to stress that not only the natural sciences, but also the humanities, need technical support posts, e.g. for data management. MUTKU stresses that its purpose-built lab infrastructure is a key component in its research (and teaching) conduct and should therefore be kept up to date including the provision of adequate technical support. HELA urges the university to ensure that the re-structuring of the university library will not result in a diminution of print-based materials.

Research/Teaching balance
While both Departments strongly subscribe to the research–teaching nexus and have provided excellent examples of how this is done (e.g. research-led teaching and introducing the instructors' research expertise), they believe that this does not receive much attention in academic reward structures and urge both Faculty and University to take more account of this aspect of academic performance. Staff in both Departments were concerned about the teaching/research balance and the panel received a strong message that time for research was compromised by teaching demands and also by

recent changes in administrative support, which among other things, have meant that PIs have to spend much more time handling budgets.

The panel notes that two Masters courses have been discontinued. It was explained that both of these were English-taught, international Masters Degree Programmes. The main reasons for discontinuation were the following: the numbers of students enrolled were relatively small (jeopardizing financial sustainability) and both programmes were assessed as somewhat vulnerable (limited resources affecting the viability of the programmes, considering that the university has a responsibility to secure students' rights to complete their studies). This presumably has implications for the research/teaching balance.

Career development for career young academics

The interview with young academics was interesting and rewarding. All had chosen these Departments for PhD training and post-doc work for good, positive reasons, being attracted by the multi-disciplinary nature of the departments and the breadth of their academic interests. Some had developed an interest in their research projects through undergraduate and masters training at; in the case of MUTKU, this is the only place in Finland to offer such training and there are few other places worldwide.

Overall, all the Doctoral students were happy with their experience, including supervision and support. There are a few compulsory courses that they can take at a convenient time, but they recognize (and appreciate) the fact that the Finnish system is flexible, leaving students free to choose how they organize themselves, but "you have to find your way". The Faculty graduate school does not seem to have a high profile. The young researchers seem to interact well across the subject boundaries and it is interesting that they have set up an unofficial researchers' association, indicating that there is a common spirit, but also that there are problems that management has not sorted out.

Concern was expressed about a two-tier system of PhD funding, with students employed by the university on grants etc. having good access to services, being allowed to supervise UG and Masters students (essential for career development), and those funded in other ways having less access to these things. As far as career development is concerned, the young researchers are clearly disillusioned by changes (past and proposed) to the tenure track process; they view this as prohibitively competitive and designed to bring in people from outside. This contributes to difficulties in meeting their goals for career development and probably requires action at both Faculty and University level. On the other hand, there is very strong appreciation of the administrative systems set up to help individuals prepare grant proposals and for data management, by the library.

Publications strategy

Especially in HELA there seem to be problems with generating high quality international publications. This is recognized but plans to improve the position could be articulated more clearly. The Department has stated, in the SAD, that they do indeed aim to increase further the proportion of publications that appear "in high-quality international fora" but they also stress that they already generate a significant

quantity of such publications. An indication is that the publications that fall into the two highest (2 & 3) categories of the Finnish JUFO classification system have risen from ca. 25 per cent in 2012 to approximately 35 per cent in 2017. On the other hand, there is a genuine case to be made, that for some activities, publication in Finnish and/or in non-refereed outlets is most appropriate, given the target audience. There needs to be a way of balancing this, at the University level, to ensure that areas where this is the case are appreciated and allowed to carry on/get credit for doing this well. The situation in MUTKU is more diverse publications linked to music neuroscience and experimental psychology rate well in WoS and there is a well-established strategy to increase them. In other areas the Department needs to develop a clearer strategy for increasing the number of JUFO 2 and 3 publications. Both Departments pay considerable attention to outreach activities and collaboration with non-university partners. These activities are an important part of ensuring that research outcomes reach not only academic audiences but also the wider public, who may very well benefit from knowledge of the research results. We recommend that outreach be a component in the University's funding model.

Integration across disciplines and multidisciplinary units

In HELA, there are good examples of genuine synergy between research groups, but these were not particularly well articulated in the SAD and there does not seem to be a firm strategy in place for identifying and developing these. The staff acknowledged that they are trying to monitor changing sub-discipline boundaries and identify new synergies ("find new openings"), but in the discussion it was not very clear how this was done.

As mentioned above, MUTKU is the result of a very recent merging. The leadership and staff in MUTKU have taken very effective steps to combine the various units into a plausible and workable combination of disciplines with a realistic common aim. Planning to date is impressive including the formulation of a clear vision and the identification of realistic goals.

Response to tension between national and JYU profiling and blue skies research

Both units actually fit in well/naturally with particular profiling areas. They seem able to embrace the opportunity these offer without unduly distorting individual research interests. This is especially the case for the Music component of MUTKU.

Plans for the future

For HELA the SAD would be strengthened by a somewhat clearer vision for the broad research areas that the unit plans to pursue in the future, including identifying and fostering new synergies; to put this another way, they have very considerable research strength but have not quite got their "brand" right yet. There also needs to be a clear strategy for achieving their stated, and entirely appropriate, aims of increasing levels of funding and high-profile peer reviewed publications and of expanding international contacts.

The faculty of HELA has drawn the Panel's attention to the fact that HELA, and other JYU departments, is extensively dependent on external research funding and

that this complicates strategic planning. The majority of the research staff in HELA, at any given point in time, are employed on fixed-term contracts that are typically fairly short (often 1–2 years at most) and tied to a particular research project and its specific goals and objectives.

The panel agreed that the historical research performance of the units/departments that now make up MUTKU has been strong in most aspects of research (e.g., grants income, hosting centres of excellence, international collaboration, cross-departmental and intra-university collaboration, and involvement in strategic university profiling areas). The main focus and energy will now need to be directed towards further integration of research strengths in the former separate disciplines/units. The plans that have been proposed to achieve this integration are ambitious yet sensible. Given the positive attitudes displayed by staff to this integration, the panel is confident that MUTKU will remain a strong performer in research. The panel recommends that it now starts focusing on identifying and/or implementing clear actions to achieve the goals and objectives of the new Department.

6.3.3. Department of Language and Communication Studies & Centre for Applied Language Studies

Based on the data provided, the overall response to the questions guiding this review

- Are the actions well defined and do they have a clear objective?
- Is the choice of proposed actions justifiable in the light of the background data?
- Is the choice of proposed actions likely to lead to the target(s)?

The answer is affirmative overall, LaCos and CALS' ideas, proposed actions and strategies are well formulated to tackle the research challenges that they are facing now and that they will undoubtedly continue to face in the future.

Research in this group which comprises two units – Dept of Language and Communication Studies (LaCos) and the Centre for Applied Language Studies (CALS) focuses on a diverse and broad range of disciplinary and inter/cross-disciplinary approaches to the study of language/communication/media in society.

The broad spectrum of research themes in this group is linked not only to diverse staff interests but also results from recent unit restructuring (including the transfer of a unit/staff from the University of Vaasa), university profiling areas as well as external mandates (by the Ministry of Education and Culture) the latter include (a) the organisation of the National Certificates of Language Proficiency (for adults, in 9 languages), their research-based development, and the coordination of the Finnish Network for Language Education Policies, and (b) the implementation, development and coordination of scientific research and higher education in the field of Finnish Sign Language in collaboration with other stakeholders.

From the self-assessment documentation combined with the presentations by the units' respective Heads and the interaction with staff and students one gains a view that this group of people

- collaborates in research at various levels including intra-departmental, intra-university and (inter)national. A recent university–level profiling initiative by the two Departments is the Research Collegium for Language in Changing Society (RECLAS);
- engages actively with other strategic research initiatives (i.e. profiling areas) at faculty and university level, e.g. MultiLete and CRISES;
- regularly reviews existing research foci/themes and develop new ones taking account of national and international challenges and events that affect communication. An example of the latter is the CALS based project examining language in refugee centres;
- provides peer group support for staff and mentoring for early career researchers (post-docs and doctoral);
- displays a good understanding of its research strengths and challenges and has made suggestions on how to tackle these mainly at departmental level;
- has formulated and set medium-term goals for research.

Furthermore, after meeting with some staff and students from these units we gained the impression that there was an atmosphere of trust and a genuine desire to collaborate to strengthen research in the group.

The following observations and comments by the review committee are meant to assist the group in managing these challenges by refining some actions or objectives so that it can achieve its research goal(s).

In our view the main areas that need attention at both group (LaCos & CALS) and university level are

- Doctoral students
- Postdoctoral Researchers
- Teaching/Research balance

In addition, some suggestions will be made about

- Managing a multiplicity of research foci and themes

Doctoral students

The situation of Doctoral students in the LaCos and CALS is complex and requires attention and action at both university/faculty and departmental levels. Although students were, overall, satisfied with the ways in which departmental staff assisted them in their research activities and provided mentoring, they experienced significant problems relating to university-wide practices and procedures. Of particular concern are (a) the differential treatment by the university of students based on their funding source, i.e. self-funded, faculty/university-funded, external grant funded, and (b) the onus on many students to constantly seek funding for their studies. We heard that access to university ID cards, specific ancillary services (e.g. health, travel), to space, equipment and teaching opportunities were dependent on the student's type of funding. Worst affected were international self-funded students who seem to have limited rights and limited assistance during their candidature. Although there may be

national regulations that constrain universities, in the organisation of such matters, we would expect the University to assist in minimizing the differential treatment of students it accepts for doctoral studies. This problem is not specific to LaCos or CALS (see the general section of the report) although it is exacerbated in this group due to the very high number of Doctoral students (130) affecting access to work space and even computing facilities.

Suggestions for actions at university level:
We consider that university-level actions will be essential to address the more fundamental problems faced by Doctoral students in LaCos and CALS. We therefore refer the reader to the relevant section in the general recommendations.

Suggestions for actions at departmental level
We believe that the Department/Centre can also assist in improving the situation of Doctoral students by (a) continuing to provide the career support outlined on p. 6 of the self-assessment document, (b) actively pursuing the suggested measures (on p. 6) for career development in collaboration with the university.

We would also recommend that LaCos and CALS assess critically the number of Doctoral students it can support in a way that reduces the current issues facing Doctoral students (see above). This suggestion is prompted by the rather high number of Doctoral students compared to many other units at JYU. In the absence of information on supervisory loads by staff, we cannot comment on whether some staff are carrying the bulk of supervisory loads or whether these are more evenly spread. However, to provide quality supervision to each and every Doctoral student, especially in the context of their current situation at JYU, LaCos and CALS should reflect on whether it can sustain such numbers in future.

Postdoctoral Researchers
Postdoctoral Researchers are key players in the research status of any discipline, department and university. Not only does their work support the research reputation of the unit and the wider University, but they also represent the next generation of researchers without whom future research will be severely jeopardized. In many cases they also contribute actively to teaching as well as supervision in their units/departments. Yet their employment situation often puts them in a precarious position vis à vis the future. The general section of this report has outlined many of the challenges. These are also present in LaCos and CALS. Within these units three issues were specifically highlighted (a) minimal tenure-track opportunities, (b) the adverse effect on the quality of one's research project of the constant need to apply for future funding and (c) the difficulty of balancing demands of the overall project vs one's own research project. LaCos and CALS are aware of these problems as they were also mentioned in the self-assessment report. They identified a range of measures that could assist post docs in their career development (p6).

Suggestions for action at university level

We commend LaCos and CALS for identifying a range of measures (p.6) and would urge the university to consider these and implement them where feasible.

Suggestions for action at the departmental level

We recommend that LaCos and CALS continue with the existing measures mentioned on p. 6 and pilot one or two of the suggested measures in connection with the university, e.g. training in project management. However, we also recommend that future applications for postdoctoral positions within grants as well as support for/acceptance of individual Postdoctoral Researchers (e.g. funded by external grants) are not only considered in terms of research merit and research focus but also in terms of the ability of the Department/Centre to provide adequate administrative, structural, career and academic support for the researcher throughout his/her term.

Teaching and research balance

The self-assessment report as well as interactions with staff demonstrated that the teaching-research nexus is well established in these units. Students, even in the early stages of their studies, come into contact with various forms of research and where possible are actively involved in some research projects or exercises. This is to be commended.

Staff did mention the rather high teaching (and often administrative) load that they carry. Combined with the regular demand to apply for external funding, there is a concern that these demands may affect adversely the quality of the research undertaken. Furthermore, the absence of a formal university-level arrangement/policy for a dedicated research leave period may hamper the timely publication of research results. Although LaCos and CALS are encouraging staff to apply for mobility or research leave grants, we suggest that they also look into teaching rosters of staff with the aim of providing a teaching-free term on rotational basis, e.g. every three/four years. This may require a review of teaching arrangements, modules and degree structure.

With regard to administrative support there seems to be a worldwide tendency in academia to centralize administrative support. This is unlikely to change dramatically. However, we would suggest that the Heads of the respective units discuss with the Faculty which types of administrative support are more productive at Dept level.

Managing a multiplicity of research foci and themes

In the introduction, we commented on the willingness of the units to collaborate in research activities, to actively engage in university priorities, to support individual research foci and to develop new foci in line with changes in society. This is commendable as is the introduction of RECLAS, and the identification of a series of research themes and clusters. Particularly commendable is the goal of making RECLAS a Centre of Excellence for Applied Language Studies.

While we applaud the units for having a vision for the medium-term future, we would like to suggest that the units reflect on the manageability of the sheer volume

of current and future research themes, existing and proposed projects. The self-assessment report has a strong emphasis on growth as captured in the phrase (p. 4) 'expand research activity ...'. Growth is beneficial if it goes hand in hand with a critical reflection on what can be managed in a quality manner, especially given the constraints identified in the current research climate at JYU and the fact that there are a number of externally mandated research activities (see above, p.52).

We would therefore like to suggest that the units engage in some discussion about setting clear research priorities for the medium-future term.

Internationalization

LaCoS, CALS and RECLAS should be commended on their international activities, especially in terms of attracting high profile scholars as visitors, its annual summer school, staff participation in key national and international conferences/workshops and its linkages with 15 universities and various other institutes and associations.

In line with our suggestions in the previous section, the units may wish to consider seeking a special relationship with two or three key partner universities to strengthen and sustain international activities in one or two strategic areas. A small number of key strategic partners tend to receive greater commitment (financial etc.) from both sides and allow for some sustained mobility over a longer period, e.g. 3 to 5 years.

Funding for externally mandated research

The units of evaluation nationally mandated research activities relating to Finnish Sign Language, National Certificates for Language Proficiency and the Language Education policies. We understand that the funding for these activities is negotiated annually between the University and Ministry of Education and Culture. The review team was unable to ascertain to what extent those directly responsible for these activities were involved in the renewal/negotiation of the funding. Given the national importance of these areas and the expanding demands, especially in the area of National Certificates for Language Proficiency, funding negotiations should be clearly guided by expert knowledge of those directly involved in the research and delivery agenda.

Conclusions

The units LaCos and CALS including the newly established RECLAS have produced an insightful self-assessment about their research – past and future. The report evidences a clear understanding of their current position and outlines some suggestions and measures to shape their research in years to come. Their identification of a range of constraints is accompanied by suggestions to minimize or overcome these both at unit and university level. The review team has provided, in this report, some further suggestions to assist the units in achieving their medium-term goal(s).

6.3.4. Faculty of Sport and Health Sciences

Are the actions well defined and do they have a clear objective?
By and large, the new initiatives and "Suggestions for Improvements" contained in the document are well defined with clear objectives. However, the devil will be in the detail i.e. the processes and structures that are required to operationalize the actions, particularly those which involve prioritisation of existing and emerging fields, and the drive for multidisciplinary research. This will at least partly depend on central support from the university as well as Faculty willingness to engage with and implement the changes.

Is the choice of proposed actions justifiable in the light of the background data?
By and large, the actions proposed have been carefully thought out by the Research Committee and are justifiable. The next stage will be to integrate the proposals and actions into the overall Research Strategy.

Is the choice of proposed actions likely to lead to the target(s)?
In general, yes, but this will largely depend upon the extent of support for the new Research Strategy, and the ability of management within the Faculty to implement the necessary change. This will be challenging and will require sensitive handling and a spirit of collective responsibility and compromise amongst all staff, who should be involved at all levels in the finalizing of the document. The Dean and Vice Deans are well supported within Faculty but will also need support from the Senior Officers of the University to reinforce the collective will to change. A new culture embracing looser structures, fewer barriers, fresh thinking, more cooperation between fields and a sense of common purpose needs to be developed, arising from a clearly articulated and agreed Research Strategy. This will take time and a manageable timetable needs to be part of the strategy. A critical issue is the need for a clear mission and vision for the Faculty. What is at the core of its operations and where does the Faculty need to be in 5–10 years' time? This is not an easy task for the Sports Sciences at JYU, involving as it does health, wellbeing, biological and behavioural sciences, sport and pedagogy (all within a societal context), but it needs to be debated thoroughly. "Well-being across the lifespan" is one such theme, which can be approached from a broad base, incorporating synergies across disciplines within the Faculty, across other departments and faculties as well as national and international expertise. This will help to unify Faculty under shared research objectives.

Introduction
The Faculty of Sport and Health Sciences is a large and diverse academic unit with over 200 staff and an annual budget of €15m. It is the sole provider of Sports Sciences in Finland. It has an excellent "brand', with a long-standing international reputation for excellence in the broad field of Sport and Exercise Sciences spanning biological, behavioural and educational approaches. It has recently undergone a restructuring process, replacing three departments (Biology of Physical Activity, Sport Sciences and Health Sciences) with a single Faculty. Within the new structure, the old departments

(with around 13 sub-disciplines) have been replaced with three main discipline groups and their sub-disciplines. These are, 1) Biology of Physical Activity (specific research theme is Neuromuscular Function and Adaptation), 2) Health Sciences (specific research themes are Rehabilitation, Active Aging, Biological Aging, Health Promotion) and 3) Sports Pedagogy and Social Sciences of Sport (specific research themes are Physical Education, Civic Activities in Sport, Sports Policy). In addition, three research centres operate within the Faculty, the Neuromuscular Research Centre, the Gerontology Research Centre and the Research Centre for Health Promotion. Thus, the Faculty is a large and complex entity charged with a remit to provide the vast bulk of research in the field of Sports and Exercise Science within Finland while at the same time competing in an increasingly challenging global university research sector. These are major responsibilities requiring a clear vision, flexibility of approach and a drive for excellence, relevance and impact. With the concurrent restructuring of research in the Faculty and the Institution as a whole, and the placing of Physical Activity, Health and Wellbeing as a core field for the University, an opportunity is there to renew purpose and fulfil these requirements.

Staffing and recruitment

This is a large academic unit of approximately 200 staff, with 27 Professors, 2 Research Directors, 46 lecturers, 19 Senior Researchers and 96 Post Docs and PhD students. The staff student ratio is favourable, which in theory should leave staff with sufficient research time (assuming all staff undertake a reasonable amount of teaching). The gender balance favours women in the first three stages of the four-stage research career model, with an even balance at Professorial level. Overall, staff are clearly committed to performing high-level research and producing outputs of international quality, something that has been a hallmark of this unit for decades. On the other hand, there is the perception of a degree of complacency and stagnation amongst staff, possibly exacerbated by the Faculty's unique position as the sole provider of Finnish Sports Sciences. Another feature of the staffing profile that needs to be addressed is the lack of foreign staff in the Faculty. While this may have arisen as a result of a combination of perfectly reasonable circumstances (geographical, linguistic, high level local applicants etc.), it nevertheless goes against the grain of increasing internationalization in Science globally and reinforces the perception of insularity.

With half of the Professorial staff due to retire within five years, an opportunity arises to address both issues, as well as the broader challenges of realigning the Faculty to the new Research Strategy and creating a common vision. Planning and recruitment for these posts will be a critical strategic task and will need to balance the need for greater internationalisation amongst the research leadership with the provision of opportunity for aspiring level 3 researchers already in place. Positions could be advertised at Professor/Assoc. Professor to encourage younger staff to apply, and further flexibility in the form of (some) 50% positions might help to attract staff from abroad. Recruitment needs to be transparent, rapid and targeted, with the use of an international recruitment agency to maximize reach. Senior staff should also be urged to use international contacts to encourage interest, with qualified parties invited to apply. Longer-term strategies may include invitations to potential candidates to give

seminars in advance of recruitment to expose them to the Jyväskylä experience and establish relationships. Clearly, the specific fields of the new senior appointees need very careful consideration and need to fit with the new areas of research focus arising from the emerging Faculty Research Strategy.

The issue of research leadership is also raised in the Self Evaluation Document (2.3). General satisfaction is apparent with the new structures at Faculty level, with individual staff also indicating their satisfaction with the streamlining of the decision-making process with a new full time Dean and two Vice-Deans, and the potential for harmonization of operations and cultures within the Faculty that this brings.

At a less senior level, lecturing positions remain teaching- oriented, resulting in reduced opportunities for lecturers to do research and compete for more senior positions. This is inequitable and needs addressing, particularly as foreign applicants at senior level will have expectations of reasonable research opportunities. The new Tenure Track system is eagerly awaited by staff and post-graduate students at all levels and will be an opportunity to get "new blood" into the Faculty, from home and abroad.

The scale and pace of change within Faculty staffing is likely to strain interpersonal relationships and potentially lead to alienation. A simple mechanism to minimize this is to ensure that a well-provided common room(s) is available for staff and postgraduates to mix and chat informally over coffee.

Development for career young academics

A striking feature of the perceived deficiencies in provision for young researchers in the Faculty was the consistency with other Departments and Faculties on this matter. Dissatisfaction with existing Tenure Track arrangements was widespread, concentrating on its inflexibility, slowness and inequities between newer and older colleagues without tenure. There is also a need to strengthen peer support and mentoring of research proposals to meet rising competition for international funding, coupled with an acknowledgement that such funding is also often dependent on multinational collaboration. Senior staff emphasized the need for small, internal start-up grants to, for example, gather preliminary data for larger subsequent grant proposals. There was also a need to integrate young researchers from different areas, as many at our meeting with senior staff and research students did not know each other and felt there was much that could be gained socially and scientifically from more informal contact (see comment above re. coffee room). Other issues included the need for support (in the form of short-term leave, research group membership, travel opportunities) for those with heavy teaching loads who wished to advance to research positions, and the iniquitous position of those senior staff who cannot access medical insurance or occupational health services because of their salary status. The Self-Assessment Document alludes to differences in culture across the disciplines in the Faculty and the differences in mentoring and other supports given to students. This needs to be regularized, with agreed levels of support and external mentoring employed where needed. Finally, it was clear that the Graduate School under its present remit and level of resourcing does not meet the needs of research students. Training of and support for these students appears to be fragmented and a more

structured approach to training and progression (for example by a structured PhD programme and an agreed taught component and teaching commitment, as well as agreed processes for student/ supervisor meetings etc.) coordinated by an expanded Graduate School is desirable.

While some of the above issues may need to be tackled at institutional or national level, it is heartening to see many of the Faculty-level issues addressed by the Self Appraisal Document.

Research development for more senior academics

In general, senior staff seem happy with the new structures and leadership of the Faculty, although access to one Dean may be more restricted than with three Departmental Heads in the old system. There is strong support for an interdisciplinary approach, particularly for research grant applications, and barriers are progressively being overcome to facilitate this. Mobility opportunities are good, helped by many established international networks. There is a perceived need to examine the allocation of human resources across the faculty to ensure balanced provision. Staff feel that they are generally well placed to meet the challenges of a new research agenda, with involvement in 4 out of 5 Profiling calls. However, Laboratory infrastructure needs improving, and the recruitment of a new Research Director should help with this. Part of the remit for this post should be the rationalization of existing laboratories to ensure they are fit for purpose for the future requirements of the Faculty.

Publications and research income strategy

A publishing strategy is lacking and should be part of the as yet to be published Research Strategy. Nevertheless, in general terms this is a successful area of operations in the Faculty, with around 200 WoS publications annually, and an average H index of 39. However, this makes up only half of all published output from the Faculty. While the unique role of the Faculty within Finnish sport (and hence the need to publish material to help sports professionals, policy makers and so on) is acknowledged, a proper balance needs to be established. Recognition of the primacy of peer review should drive strategy, and reasonable targets set for both types of publication, but favouring peer review outlets. Original research worthy of peer review in international journals should not be published in Finnish journals. While the imbalance between the publication profiles of health sciences together with the biology of physical activity sciences and the sports sciences (which includes Pedagogy/Social Sciences) is to be expected, at least some of this mismatch may be attributable to the publication productivity of the staff in these groupings. Every effort must be made to stimulate a publication ethos in underperforming pockets of staff. A reasonable expectation might be a minimum of two peer-reviewed publications per year per staff member. The growing importance of impact from research outputs needs to be recognized, and appropriate publicity generated for public consumption at every opportunity. The recent success of social media needs to be sustained, and the internal market must also be cultivated to ensure that the higher officers of the university know about and appreciate the world-class research being conducted.

Research income at 25% of total is slightly lower than other units and needs to be enhanced, with a concerted effort aimed at international funding sources. Over the past few years, the latter has made up around 5% of total research funding, and although 2017 saw a marked increase to around 18%, the Research Strategy need to address how this can be both sustained and enhanced.

In general, international comparisons in research and publications, rather than regional ones, should become the yardstick of success for the Faculty.

Internationalization

This is partly covered under 1) above in relation to Professorial appointments.

There is a need for investment in Internationalization at both Faculty and university level. Sports and Health Sciences is uniquely placed in JYU, and the barriers to internationalization in the Faculty need to be tackled head on. These appear to be geographical (Helsinki-centric attitudes, relative remoteness of JYU) but they are also cultural and linguistic. For example, it was mentioned that in the recruitment process, "Very often, the local candidates are superior". This may be so and is a tribute to the excellent education provided at JYU, but it is clear that excellent candidates do exist abroad, and every effort must be made to ensure they are enticed to interview. Similarly, translation of all relevant materials into English should become the norm for post-graduate students and staff to ensure that JYU becomes a "warm house" for foreigners. Short study breaks abroad for existing staff should be available, and seminar series and visiting scholarships inviting scientists from abroad would aid the process and perception of internationalization. Use of existing networks and collaborations will greatly aid this process.

Future plans / Horizon scanning

The Self Evaluation Document acknowledges the need for a systematic evaluation of the research environment and outcomes. Some progress has been made, and the PowerPoint presentation on "Research Activity" presented to the panel forms an excellent platform.

Ideally, this systematic evaluation should be carried out before the Research Strategy, but the latter is well under way and so should include the need for the evaluation in its recommendations.

It is clear that the Faculty is keen to change its culture from a largely reactive to a proactive one, driven and guided by the new strategy. Given the importance of the Faculty to national sports science and Physical Education, it will be important to embed horizon scanning into the culture of staff. Research has to be driven by new questions and increasingly by questions that are seen to be relevant to society at large. Researchers at all levels should contribute to this process. There may be a need for rebalancing the research activities of the faculty between existing fields, emerging fields and those yet to be identified (e.g. new collaborations or fields of expertise brought in by new staff). Above all, the new Faculty needs to be an enabler for research, with a clear vision and a strategic overview of what should be done within a flexible framework to allow diversity of excellence. There is much top-class research going on at JYU, and the Faculty needs to actively seek out potential collaboration and

sharing of facilities e.g. Nano and Biological Sciences, Metabolomics, NMR and Electron Microscopy , as well as possibly with the Social Sciences.

6.3.5. Faculty of Education and Psychology & Finnish Institute for Educational Research (FIER)

Regarding the three overarching questions in the self-evaluation report

- Are the actions well defined and do they have a clear objective?
- Is the choice of proposed actions justifiable in the light of the background data?
- Is the choice of proposed actions likely to lead to the target(s)?

The answer is clearly affirmative. The faculty leadership seems well aware of the challenges that lie ahead, particularly in terms of staffing, and in terms of finding the balance between international high scientific impact publications and national high societal impact publications. The proposed actions for improving recruitment, mobility, and (international) cooperation; for increasing the academic culture (including applying Open Science), and for addressing the challenges with publishing seem to be justifiable and lead to the targets. The faculty leadership is encouraged to take a somewhat stronger lead in this, and fully use the capacities that already seem present among the academic staff.

Background

The Faculty of Education and Psychology is a recently (2016–2017) formed faculty, where the former Faculty of Education (with two departments, Education and Teacher Education) formed a new faculty together with the Department of Psychology (that was previously a part of the Faculty of Social Sciences).

In addition to the Faculty of Education and Psychology, this evaluation also concerns FIER, the Finnish Institute for Educational Research. FIER is a separate research institute but is housed in the same building as the two educational departments.

The self-evaluation report, as presented by the faculty and FIER together, in combination with the site visit, where the committee met the leadership, staff, and young researchers in the PhD and post-doc phase, leads to the impression of a young, ambitious, and open faculty. The self-evaluation report was written as a clear and critical reflection, but also with an eye open for all possibilities of the new situation. For FIER it becomes clear that this institute has a somewhat different (financial) structure, for which the focus very much has to be on recruitment. FIER also has more specific national responsibilities, which sometimes call for more applied research.

Focus

Several clear research areas (learning; interaction; teaching, guidance, and education; work life; and family and childhood) are described in terms of starting points for a vision of the faculty, that is to be further developed and refined in 2018. For FIER, three research areas are defined (educational systems and society; education and the world of work; and learning, teaching, and learning environments), within which several major new projects are defined. During the site visit, it became clear that all units (the

three departments and FIER) clearly see the advantages of the new structure and possibilities for cooperation it brings.

Staffing

Regarding staffing, the self-evaluation shows that the number of professors has been relatively stable in recent years (at the level of 29.3 in 2017), however there has been a decline in the number of professorships in both the Department of Psychology (down to 7.8) as well as FIER (down to 4.5). Especially for Psychology, this has led to a proportion of less than 50% of full-time senior level personnel, which the committee thinks is somewhat worrisome, although the current ongoing recruitment processes should reduce this problem.

Issues with recruitment and staffing appear to be similar to those in other faculties. The slow administrative process, for recruiting to professorships, was mentioned and this may make it difficult to attract new staff members, especially from outside Finland. Also, the lack of a clear tenure track system was mentioned as being a problem, as was the lack of a good system for research leave.

Senior staff seems quite happy with their working conditions. They report having time for teaching and for research. The balance between teaching and doing research is said to be good. Also, satisfaction was expressed about support for writing grant proposals. Having said that, however, complaints were expressed about the administrative support after a grant has been received.

It is worth noting that some of the senior staff members mentioned that they used their students' theses as part of research projects, thus making it easier to connect their teaching and research.

Development for career young academics

For the young academic staff, what seems to be lacking the overall structure of a graduate school (either at the university or at the faculty level) PhD-students do not report many joint activities, and if they do report them, this seems to be organised at the level of an individual professor's research group. An exception here is the Department of Psychology, where regular joint research meetings are organized. PhD-students seem happy with the course offer, where there are few mandatory courses, but more electives and tailor-made courses.

The system of funding for PhD-students and for post-docs is problematic, where the young academics with disproportionate effort needed of the part of ECAs in order to secure their next job, instead of doing research and improving their CVs. This problem seems to be aggravated somewhat by the fact that they don't seem to have much support when writing grants.

The PhD-students and postdocs also told us that they would prefer to be embedded in larger projects, with more support, more mentoring, and more possibilities for involvement in the project. Also, several post-docs mentioned that they would like PhD students to help them with analyzing the data, writing articles, etc.

The committee is of the opinion that the university should consider funding longer-term PhD-tracks. This would mean that individual PhD-students could spend more time on their research.

Funding

The funding situation in the faculty and FIER seems to be fairly stable. Some differences within the faculty exist, with both the Department of Psychology and FIER obtaining around 50% external funding, and the two other departments around 20%. Most Senior Researchers submit applications to the Academy of Finland and an increasing number to the ERC grant schemes. It is noted that the success rate of the EU applications has been relatively low lately, but suggestions for improving this are mentioned in the self-evaluation.

It was also mentioned that the planning of laboratories and the maintenance of several long-term longitudinal data sets is somewhat challenging due to the lack of a clear long-term funding plan. It seems that this is an issue in which the leadership of the faculty could take the lead.

Publications and impact

The analysis of bibliometric data shows an increasing publication activity over the recent years. International publications and publication co-authored with international colleagues are also increasing and are at a good level.

It was stressed that this faculty national publications form an important arena for publishing, and the JUFO classification in this respect is problematic. The committee agrees with the remark mentioned in the self-evaluation that a balance in publishing in different outlets is needed.

Profiling and strategic research areas

The faculty seems to have clear ideas about strategic research areas and is involved with two profiling actions. For the actions MultiLeTe (phase 1 and phase 2) central themes are related to learning, learning difficulties, interventions in learning, etc., and educational sciences and psychology, as well as FIER, seem to be central partners. For the action BRAIN, the department of Psychology seems to play a leading role.

During the site visits staff members described how the entire national profiling initiative initially seemed a bit top-down. They experienced some lack of knowledge about what exactly was happening, and also some pressure in making decisions about what to emphasize. Later the process became much more bottom-up. Staff members seem to realize the importance of the process of profiling, and consider it to be a good thing, and a source of creativity.

Conclusions

When addressing the main questions to be answered in this evaluation, we came to the conclusion that for the Faculty of Education and Psychology and FIER the leadership and the staff seem to be well aware of the challenges they face and have defined clear actions to address these challenges. To the committee, it also became clear that strengthening cooperation within the Faculty, and between the faculty with

other units in the university would be important. Ideas about such cooperation are already clearly present, including enthusiasm about it. Strategies to further enhance and improve such cooperation might be developed somewhat more by the leadership of the faculty and the university.

A slight discrepancy is noted between statements in the self-evaluation report that strategies are not yet in place and need to be developed, and the meetings during the site visit, where the committee noted that both the leadership and the (young and senior) staff had fairly clear ideas about the directions to take. The faculty leadership acknowledges this slight discrepancy and makes use of the potential for solutions and actions that seems to be already present. It is our opinion that the Faculty of Education and Psychology and FIER has reason to be confident that they can address future challenges, when they focus on the actions mentioned in the self-evaluation and discussed during the visit.

6.3.6. Faculty of Information Technology

Regarding the three overarching questions in the self-evaluation report

- Are the actions well defined and do they have a clear objective?
- Is the choice of proposed actions justifiable in the light of the background data?
- Is the choice of proposed actions likely to lead to the target(s)?

The answer is generally in the affirmative. However, there are a number of observations, comments, and suggestions that the evaluation panel would like to make which might be useful as a source of input for the management of the Faculty in its continuous pursuit to improve research outputs and to ensure the vitality of its research enterprise.

The Faculty of IT was restructured in early 2017 mainly through a merger of a couple of departments and other relevant units, with the intention of strengthening cooperation within the Faculty, and to better integrate applied project activities with education and scientific research. The restructured Faculty of IT is a single academic unit without departments. Research is organized into 4 areas:

- Computational Science and Applied Mathematics
- Information Systems
- Learning and Cognitive Sciences
- Software and Communication Technology

Within these four research areas, there are 12 research groups with each one led by one (or more) professor. There are 16 (FTE) full professors in the Faculty, according to appendix 1 of the self-evaluation report.

In addition to the 4 main research areas, the Faculty has 2 new research profiling areas recognized by the Academy of Finland in:

- Cyber Security
- Decision analytics utilizing causal models and multiobjective optimization (DEMO)

Based on the information contained in the self-evaluation report and interviews with personnel in the Faculty, there is evidence of a good deal of research activities occurring in all of the 4 research areas, attracting sizeable external funding and

producing a respectable amount of publications overall. However, there are significant quantitative differences in terms of external funding and research output across the 4 areas, with Computational Science and Applied Mathematics being the strongest and the Software and Communication Technology being the weakest relatively.

As apparent from the interviews, there is generally a strong research ethos and people are enthusiastic about doing research and improving publication quality/impact. However, it seems the merger of the departments has not yet resulted into a cohesive single academic unit. There isn't much evidence of inter-area or inter-group collaboration across the 4 main research areas or amongst the 12 research groups. Indeed, as indicated in the self-evaluation report, the groups are somewhat "autonomous".

In research, the Faculty's strategic goal is to pursue the following attributes simultaneously in its research work:

- High quality and excellence
- Topically
- Societal impact
- Visibility and international impact

A set of actions plans have been laid out, aiming to facilitate the advancement of its strategic research goal.

Staffing

The Faculty's strategy of focusing on recruiting top-level scholars globally, even though they may be relatively junior (i.e. assistant/Associate Professors) has merit, considering the nature of the global talent pool in IT currently and the competitive recruitment forces at play. In some areas, junior level academic recruitment often takes place in key annual academic conferences (e.g. ICIS) where the best candidates will be available. A strong and coordinated faculty presence in these conferences would be conducive to recruitment.

Development for career young academics

There is a sizeable Doctoral student community (189 FTE) in the Faculty, with over half of them pursuing their studies full-time. About one-third of the Doctoral students are international. The size and mix of the student body appear healthy. The Faculty runs an annual Summer School providing opportunities for Doctoral students to interact with leading scholars in their fields. This seems to be a good practice well received by the students interviewed.

The number of PhD degrees awarded annually is around 20, with a median completion time of 4.2 years. However, around one half of enrolled Doctoral students never graduate.

Even though there is a Faculty level Graduate School, Doctoral students in the 4 research areas seem to follow very different programmes with almost no overlapping core courses. This may not be conducive to research collaboration as students in different areas within the Faculty may have no idea or understanding on how and what research is done in the other areas in the Faculty. To address this issue, a common Faculty core course on theory of knowledge and research methodology/ paradigms

may be useful in providing a common ground for students in the Faculty to understand or appreciate others' work.

There are other issues related to the different treatment of Doctoral students depending on their funding sources etc. that may impact negatively on the training of Doctoral students. However, these issues are to a certain extent common across all academic units, which will not be further elaborated here.

Research and publication strategy

The Faculty strategically wants to pursue high quality research with relevance, societal impact and international visibility.

There is a reasonable volume of publications, but the outlets are very diverse. Many outputs (75% of all) are "invisible" - i.e. not indexed in the WoS citation database. Further, of those that are indexed, only a quarter are of "high quality" (JUFO 2 and 3). The lack of focus in the choice of publication outlets makes it very difficult to produce and sustain a sufficient volume of high-level publications in a chosen research area to make a substantial impact. A more focused publication strategy with plans on how to put the strategy into effective actions would be useful.

The action plans laid out contain clear objectives but are rather short on how to achieve them. For example, the Faculty plans to support career paths of the junior staff with the help of senior staff but contains no indication on how this is to be done.

It would be useful to set up some concrete research performance indicators and expectation parameters which could help inform whether and to what extent progress has been made towards its strategic research goal.

Despite the merger of departments, there is no clear evidence of any substantive improvement in collaboration across research groups in the Faculty. The 4 research areas and the 12 research groups are autonomous generally. To reduce the risks of the groups turning into research silos, a more proactive collaboration strategy championed at the Faculty level may be useful.

For a Faculty with less than 20 professors, the question of whether 12 research groups are too many needs to carefully and strategically considered. Research groups in leading IT Faculties globally tend to be much bigger in size and resource level, with correspondingly high levels of output and impact. Small groups may still be fine at a national level in some niche areas but may be hard to compete at a global level. Some hard-strategic choices may need to be made if there is a desire to excel at a global level. There may be fewer research groups, but they will be stronger, better resourced, and better able to compete at a global level.

Since IT is a high-growth industrial sector, opportunities for external funding tend to be relatively plentiful. However, if these externally funded projects are misaligned with strategic goals of the University or the Faculty, these projects and the personnel they support might create more problems than benefits for the Faculty and eventually hamper its strategic development. It is suggested that a set of criteria be developed to guide faculty members in developing externally funded projects to ensure a certain level of strategic alignment in terms of focus areas and level of scientific work required.

Internationalization

There is apparent progress in internationalization, especially at the junior researchers' level (including Doctoral students), with an improving mix of international personnel. There is a good level of support for attending international research conferences and research visits. The panel was told in the interviews that the English qualification requirement for international Doctoral students applying to study at JYU is higher than those of other Finnish universities, thereby putting it at a disadvantage in the recruitment of international students. It is suggested that a more comprehensive benchmarking of English requirements for doctoral studies in similar disciplinary areas across leading universities globally be made to see if there is indeed a strong case for making an adjustment.

Conclusion

Research in the Faculty appears to be in a reasonably good shape, with a strong research ethos generally and excellent outputs in some areas. There is a sizeable Doctoral student community with good research support in their respective areas. However, to further improve and climb up to the next level of excellence (perhaps at a global level), a more focused and actionable research and publication strategy may be needed to enhance collaboration and draw across the strengths of all areas within the Faculty. The two recently developed profiling areas of Cyber Security and Computational Thinking/Decision Making may present good opportunities for better integration and synergy across the Faculty. To achieve that, a more proactive research leadership at the Faculty level with clear, actionable implementation plans and measurable outcomes may be useful.

6.3.7. Jyväskylä University School of Business and Economics

The presentations by the Dean and the Vice-Dean, together with the interviews, revealed the dynamic nature of current developments within the School. The School is characterized by a very open and supportive atmosphere. Performance has been favourable looking at the rise in competitive research funding, the increase in peer reviewed publication, its position in the world rankings and its initial AACSB accreditation process. However, these successes, higher aspirations, and expectations create new dilemmas.

Are the actions well defined and do they have a clear objective?

The School has identified a list of action items to be implemented over the next few years in the area of research, funding and societal engagement. The JSBE strategic goals for 2017–2020 are 1. Producing high-quality research, 2. Strengthening of focus areas internationally through cooperation, mobility and funding, 3. Educating skilled researchers.

In recent years three focus areas have been developed 1. Responsible Business, 2. Digital Business and Economy and 3. Policy-Relevant Economics. Ultimately this might lead to e.g. Academy of Finland Centre of Excellence confirmation.

Strong areas in empirical policy-relevant research are labour economics, health economics, and economics of education, and macro-finance.

The need for further development was seen particularly in the following areas (1) strengthening the academic culture (by constant improvement and more external research funding). (2) Clarifying the research group operations (reducing the number of research groups, collaboration around focus areas). (3) Building network mentality (by strengthening interdisciplinarity). (4) Succeeding in internationalizing (emphasizing international research projects, mobility, and flexible international recruitment).

Is the choice of proposed actions justifiable in the light of the background data?
The research strategy of the School calls for an intensification of efforts to attract and retain high- quality researchers and to increase the research output in top journals. These goals are widely shared by faculty and staff, but they appear to the panel a little over ambitious, in the time scale, given the constraints faced by the School and the funding and investments that are being contemplated. The School has formulated the following dilemmas

- The tension between time for research and time for teaching (e.g. there's a large teaching demand because minors are open for students outside the School).
- Increasing internationalization and the possibilities for funding.
- The publication criteria of the university (important for the School's funding) versus the international publication rankings.
- Central versus local processes (e.g. non-flexible HR processes).
- Tenure track need vs. current practice (policy is not clear).
- Rewarding versus equality (adapt to international wage-setting).

In our interviews these dilemmas have been discussed. Indeed, many of these relate to mastering internationalization. Internationalization is also a strategy that needs to be developed internally.

The principal dilemma faced by the School is the need to find a way to enhance and connect its already strong national relevance, to ensure even stronger contributions to international markets. The generic nature of the existing School mission of 'educating students', 'advancing knowledge' through research, and engaging with business and society tends to reflect the tension between these national and international emphases that we felt, during our visit. It is critical that the School resolves this tension and translates its already strong national contribution into the international arena to underpin its development as a leading school. There are three development imperatives which are central to addressing this over-arching challenge.

- Development of a sharper strategic value proposition aligned to the University that guides initiatives to shape its research, education and engagement. This should be supported by improved financial autonomy, closer management of risks, and controlled implementation using KPIs and milestones;
- Clearer articulation of the international position of the School to guide priorities and actions in line with a benchmark European school, and reflected in e.g. an international advisory board, faculty and student bodies, and international student experience.

- Forging of stronger linkages with international academic and corporate partners and the sharpening of a distinctive, valued and viable executive education portfolio to support the realization of (1) and (2).

Is the choice of proposed actions likely to lead to the target(s)?
A particularly significant and positive achievement is the reduction in the number of research groups. This started as a top down initiative but seems to have become a bottom up process now. The number of groups has been reduced from 14 to 9 and the criteria for these groups could perhaps be a model for JYU overall. However, further reduction could be contemplated to ensure sufficient critical mass as the number still seems too high for the size of the School.

The school is committed in its internationalization efforts to broaden perspectives for its entire staff. It has increased its efforts to recruit more international faculty and developed a comprehensive exposition of its employment package and opportunities to attract talent to Jyväskylä.

The global environment, in which the School must operate, is highly dynamic. That is why all business and economics schools need to evolve continuously, as both business and students look to them to add value through research and education. As it adds to competition and raises its own aspirations JSBE needs to advance too.

The panel recognises that, while there are great strengths, the Finnish regulatory framework imposes constraints on the School that it has no choice but to work within. While continually challenged by this, the panel feels the School's leadership is very much aware of how to work within the constraints and how to take advantage of opportunities.

Progress has tended to focus on bolstering the strength and national standing of the School, rather than making its focus and position more international, in terms of research, student experience, and engagement. Thus, while progress has been systematic and strong, we conclude that the School is still on a journey. To meet the standards of top schools that e.g. AACSB demands, it will need to make further efforts to focus the proposition it offers, the internationalization of the School's full portfolio of activities, and to developing strong relationships with corporate and academic partners internationally.

However, continued strategic developments along the lines we have described above and in our additional recommendations should be taken as an encouragement for the School to work assiduously with the University to become a more ambitious and distinctive school with the power and presence that is recognized both nationally and internationally. Doing both will aid the recruitment of scholars, students, the construction of appropriate international alliances/consortia with other schools, and will stimulate collaborations with businesses to foster education, student recruitment, research and its impact.

There is absolutely no doubt that the School is well known in Finland across Europe, and in part in the global market for management education. We therefore congratulate the School for the rapid steps it has taken to pave the way and bring its mission to life, as this progress implies that it has a strong position and an important role to play in the markets in which it operates.

Staffing

The School has appropriate policies and systems for the recruitment, evaluation, and promotion of faculty, but also some weaknesses. Indeed, the recruitment and retention of top-quality faculty will be one of the biggest challenges facing the School in the coming years. This is because of the limited resources that the school can deploy in a very competitive European environment alongside the constraints on compensation imposed by the Finnish system.

There is a need for more clarity in relation to tenure track practices. Furthermore, mobility processes seem to be slow because of inadequate administrative procedures. Indeed, the promotion and tenure process, particularly the move to a UK/US-like tenure track system, with probationary review and an up/out decision, is commended.

The School needs to sort out the nomenclature for the jobs and career structure; e.g. there is a disadvantage of the nomenclature of postdoc/University teacher when the expectations sometimes are the same in relation to research activity.

JSBE needs to enhance the internationalization of its faculty base, becoming a leading School necessitates that it finds ways to extend international faculty participation, so it can achieve these ambitions. It also needs to enhance yet further the internationalization of activities beyond Finland including staff mobility and participation of international and domestic students.

Development for career young academics

Discussions with students revealed that they are engaged and dedicated to their programmes and recognize the quality of the research supervision and instruction in the programme. They would like to be involved in strategic discussions regarding (interdisciplinary) joint research. In Economics the 'old' national doctoral school still functions with Helsinki playing a major role, but support for this seems unlikely to continue so alternative support needs to be considered. In Business there is a voluntary network, with money from the universities and from foundations, which provides for high quality teaching in specialist areas across the collaborating universities.

Our understanding from the interviews is that sometimes PhDs start without any funding. We consider it best that PhD students have grants or bursaries in place before they register and that the extension of funding needs to be in place before the end of an existing grant.

It was explained that university wide and even nationally most Doctoral students are enrolled before they have a grant. The first step is usually to gain the right to study, and then, students are eligible and can start applying for grants, internal or external. Furthermore, many Doctoral students never get or even apply a grant. They undertake their studies while having a job outside the university. This is bound to adversely affect completion rates, which in turn effects the status of the School.

The encouragement and systems to support PhD candidates to spend research time in other international business schools is minimal and somewhat inferior to that elsewhere in Finland and internationally. There seems to be an ad hoc approach to career development. The danger is that PhD candidates from the Jyväskylä area may spend the whole of their academic career at their local university. Such deficiencies are

relatively easy to fix but are crucial because the destination of a schools research graduates is a critical metric for high quality schools.

To increase an international academic culture, it is wise to invest in bringing in visiting professors. This needs a thorough strategic approach to visiting academics and to what they should contribute.

Publications strategy

The School has progressed substantially, both in the volume of its output research and in the average quality of its publications. It will be challenging to achieve more international top-level publications. Publications of high-quality in journals associated with schools of management will help the school make progress on its goal. Top-level publications take time in revisions so these need to be undertaken carefully and time allocated to do this. Successful researchers could be rewarded with extra research time.

Internationalization

The interviews with staff revealed that there is no consensus on the international benchmark Schools. The School should list realistic comparison Schools and research groups and should establish and International Advisory Board.

Outreach and impact

The links e.g. with Tekes (Business Finland) research projects involving private companies and with the Central Bank are extremely important and could be better documented.

6.3.8. Department of Mathematics and Statistics

We were impressed by the Department's self-appraisal, as reflected in the SAD (which is succinct but very informative). The presentation by the Head of the Department and our interviews with Senior Researchers and professors. We note that although the main emphasis in both mathematics and statistics is on fundamental basic research, there are strong applied elements as well. All the evidence suggests that leadership is democratic, supportive and effective, with a clear strategic vision. The Department is active in research networking and collaboration with other universities, both at national and international level, and with national research institutes; this is reflected in a large number of joint publications. The Department is involved in two Centres of Excellence funded by the Academy of Finland and partly by the University of Jyväskylä (henceforward the University), two researchers have been awarded by ERC Grants (Starting and Consolidator) and the unit has several Academy research fellowships, all reinforcing the high-standard of research and higher levels of funding.

In the text below we highlight points raised in the SAD, comment on some issues not raised in that document and suggest some actions that might be taken to improve the Department's research output and ensure scientific renewal.

Staffing

The Department, which is of moderate size (10 professors and 10 Senior Researchers), has experienced a substantial turnover of staff during the assessment period, with nine members retiring and six moving elsewhere, many to the University of Helsinki. This has been accompanied by eight new appointments, the Department having had good success in recruiting internationally recognised mathematicians and statisticians. The SAD reports a shortage of mathematicians coming into the system at all levels, many young statisticians for example leaving to take up well paid/secure posts outside academia, making recruitment challenging (See below under outreach). We note that the proportion of female staff members up to lecturer and Senior Lecturer level hovers around the proportion at PhD student level, allowing for small sample sizes, so there may not be recruitment barriers up to this point. However, there are no female professors; the absence of female academy professors is presumably outside the Department's control. We suggest that the Department includes in its staffing strategy steps to redress this imbalance, both for reasons of equality and to improve recruitment at undergraduate, PhD student and Postdoc levels (see above), by giving mathematically gifted young women justifiable role models.

A further potential barrier to effective research and to retention, which may well also compromise performance, is the fact that the building in which the Department is housed is old and unhealthy. The University is aware of the situation and has this in its works programme.

Development for career young academics

The PhD students and Postdoc researchers to whom we spoke had come to the Department by different routes, some through the University and others from elsewhere, in answer to advertisements or through existing research contacts of Department members. All were in receipt of salaries and although they reported that a few of their colleagues were supported by personal grants, we got no impression of a two-tier system as reported in other Units (see general report). Both PhD students and Postdocs spoke very positively of the Department as friendly and supportive, and with very good international contacts. They clearly get excellent training opportunities at Department/Faculty level. All were entirely satisfied with the level of supervision and mentoring they receive, but the University Graduate School makes very little impact. There is a very active and well-attended programme of seminars to which PhD students and Postdoc researchers contribute as appropriate. Good systems are in place for career development, young researchers receiving extensive help from supervisors, mentors and colleagues in identifying opportunities and in making applications. There is a strong international outlook here as in other contexts. There are clearly excellent opportunities for mobility, both in terms of conference attendance and in terms of making research visits.

Some factors were identified as hindering training and career development for young researchers. Primarily, the new centralised service centre (including IT support) is experienced as inefficient, unresponsive and slow. This compromises research and is demoralising, and it is important that actions at the University level to improve this

are given high priority. International students expressed the wish for more courses, including maths courses, in English rather than Finnish.

Research development for more senior academics

The Department reports limited mechanisms to support career paths for mid-career researchers (above PhD student/Postdoc level), due to current tenure system. As for younger researchers, there were several complaints about central administrative services. Loss of Departmental support to PIs for administrating projects has meant that a much greater burden falls on PIs, fragmenting their time and making research less efficient. Inflexibility was reported concerning accounting on certain kinds of EU-funding, making it "hardly worth applying". This too compromises research efficiency and it is important that actions at the University level to improve this are given high priority.

Publication strategy

During the assessment period, the Department has achieved an impressive record of high-quality scientific publication, producing numerous research articles in high impact peer reviewed international journals, both mathematical and statistical. These publications are highly cited in the field of natural science and mathematics and statistics. The Department ranks near the top among comparable units elsewhere in Finland. The SAD describes a clear strategy for sustaining this impressive publication record in the future, with strong encouragement for submitting articles to high-level international journals and for open access publication.

Research/teaching/administration balance

The Department takes charge of the teaching of Mathematics and Statistics courses through the University, which means that there is a large amount of service teaching. Basic level teaching is largely carried out by University teachers, whose main job description is in teaching rather than research. The Department hopes to build up a new statistic section interfacing teaching and research but reports a shortage of potential recruits. As a consequence of the Department's recruitment strategy and the fact that faculty members with strong external funding get lighter teaching loads, there are in effect staff members who cover most of the basic teaching and do relatively little research. This works well for dedicated teachers who are not particularly interested in research but may be a problem for researchers who are allocated more teaching because they are, perhaps temporarily, relatively unsuccessful at gaining research funds.

The Department comments on the lack of adequate support for research leave at the University level. There is an in-house system for ensuring that staff get regular teaching-free periods. This works well, but the view was expressed that the Department is not quite large enough for this and that two new staff members would help in getting the system to work properly. In was pointed out that research visits need to be planned well in advance and that information about research leave is not always known in time.

Collaborations and internationalization

The Department has many active collaborations with other entities within the University. Data science is an emerging area identified for possible further collaboration with computing and environmental science. It also has joint research projects with several national research institutes and is a member of several national networks, for example, the Finnish Doctoral Education Network in Stochastics and Statistics. The Department is strongly international, at levels ranging from master's students to appointed professors. The appointment strategy is strongly international, the pattern being to identify the best candidate wherever they are and actively recruit them. The Department hosts many visits from international researchers and makes very good use of visiting professorships, including sharing with other Finnish universities. They report a paucity of tools at University level for supporting these. The SAD reports a proposed new international master's programme, which will help in recruiting new international students.

Outreach and impact

The Department participates in a number of outreach activities and gets good media coverage for its work. During the visit, outreach was mainly discussed in the context of recruiting in schools, which is necessary due to domestic student generations getting smaller. The Department has a very effective scheme in operation for raising the profile of mathematics in schools. This relies on one committed teacher and seems to be having positive effect on student recruitment. Given the importance of attracting school children for eventual recruitment at all level, it would be advisable to expand this, to make the scheme secure. The SAD recognises the increasing importance of mathematicians and statisticians in industry and the private sector and the career prospects that these offer to PG students who do not wish to remain in academia. They have organised events in which selected alumni discuss their jobs with students and staff. This is an excellent initiative that should certainly continue.

Profiling versus bottom up and blue skies research

The Department responds positively to profiling, seeing this as providing opportunities and not supressing creativity. The research of the Department belongs to the core field "Basic natural phenomena and mathematical thinking", mentioned in the University's strategy. The Statistics group is a part of the on-going profiling action DEMO (Decision analytics utilizing causal models and multi-objective optimization) funded by Academy of Finland. The Department has a good strategy for its own research, which is focused on those areas where their research is at a high international level. The aim that every research group is connected to some other group guarantees that groups communicate with and support each other and promotes exchange of ideas and methods between research fields. Profiling at the Departmental level includes collaboration with the Faculty of Information Technology and the Faculty of Sports and Health.

Funding

The two centres of excellence, two ERC Grants (Starting and Consolidator) and several Academy research fellowships are already excellent markers for successful funding. The department expressed discontent with the model at the University for distributing money to departments, feeling that they subsidise other (less successful and more equipment-hungry) units. The panel notes and understands this view. Perhaps the distribution of funds could be changed a bit, but this may have been balanced by the fact that they have received strong University support for rapid headhunting. During the interview with senior staff, we discussed the statement in the SAD about not all staff being encouraged to apply for research funding. The Head of Department explained that this referred specifically to highly competitive funding schemes such as then ERC, in which context the policy makes very good sense; this will be clarified. Although the SAD described an aspiration to increase funding for statistics, Senior Researchers were not very responsive to suggestions about other, possibly more applied funding, especially from international sources. We understand the tension between gaining such funding and having time to continue with fundamental basic research topics but suggest that such alternative sources may be worth exploring, in case, for example, funding from the Academy of Finland falls.

Future plans / horizon scanning

The department has a good, strongly proactive system in place for recruitment, identifying and headhunting the best international researchers when available. They deliberately concentrate on people with a proven track record of gaining competitive funding. We discussed whether this attracts people who do not want to do a lot of teaching and perhaps are likely to move on. There is not much scope for making attractive packages to keep people who are being head hunted by other prestigious Universities. The Head of the Department expressed the sensible and realistic view that this is a fact of life and that the people concerned usually make strong contributions to the Department with lasting effect before they move on.

In terms of subject matter, the department leadership has a clear vision for the future of their research operations. Having identified the areas of research in which they have strong international standing, the aim is to recruit so that the critical mass needed to support an international profile is retained. Research focus will be maintained, while allowing connectivity between research areas and room for new ideas. Horizon scanning is at the level of continually seeking out the very best researchers who fit this profile and actively recruiting them. Over and above this, the aim is to strengthen links between mathematics and statistics. Developing further expertise in stochastics is one step here.

Conclusions

Concerning the University's three overarching questions, the actions proposed by the Department are indeed well-defined and have clear objectives; the choice of proposed actions is justifiable in the light of the background data and the choice of proposed actions is likely to lead to the identified targets, although there are a few constraining factors that have been discussed above.

6.3.9. Department of Physics

Are the actions well defined and do they have a clear objective?
Is the choice of proposed actions justifiable in the light of the background data?
Is the choice of proposed actions likely to lead to the target(s)?

The Department has a clear objective, namely to be a scientifically recognized international unit including high-standard infrastructure that allow it to carry out high quality research and to be in a strong position to cooperate with international research groups. However, for a long-term research planning where impressive infrastructures play a major role, the Department needs a sustainable, stable and coherent funding model/ infrastructure strategy including a funding mechanism from the University so that the unit can ensure that it can cover the costs relating to this infrastructure. Plans to strengthen further the intra- (biologists) and interfaculty cooperation will, undoubtedly, increase social impact and engender new possibilities for external funding.

Below we highlight some points raised in the self-appraisal document and during our visit.

The Department of Physics is administratively and financially one unit without any sub divisions. Research is focused on two main areas, subatomic physics and nano- and materials physics, and the only discipline in research and teaching is physics. Research in subatomic physics, including theoretical and experimental research in cosmology, particle physics and nuclear physics is carried out by about half of the senior staff. Less than half of the Senior Researchers are involved in research in the nano- and materials physics - including experimental, numerical and theoretical studies. This research takes place mainly in the interdisciplinary Nanoscience Centre, where physicists, chemists and biologists work together at the nanoscale. The Accelerator Laboratory, that belongs to Finland's roadmap for national research infrastructures, is an integral part of the Department, and in this unit internationally high-standard research on basic natural phenomena is investigated. University of Jyväskylä has been very successful in all four Academy of Finland competitive funding PROFI calls that aim to strengthen university research profiles and the quality of research. The Department of Physics is involved in two profiling areas "The Structure of Matter with Accelerator-based Methods" and "Molecular Nanoscience"; both areas are mentioned in the operational agenda of the strategy of the University. Nuclear and particle physicists actively contribute to CERN, the European Organisation for Nuclear Research, and to building the international FAIR particles accelerator laboratory.

The Department of Physics has been successful in the most competitive funding instruments that can be used as performance indicators for the quality of research. The Department has, at present, two ERC grant holders, six Academy research fellows, and one Academy professor (jointly with the Department of Chemistry). In addition, the Accelerator Laboratory operated for six years, until at the end of 2017 the Centre of Excellence in Nuclear and Accelerator-Based Physics was created.

The assessment panel supports the Department's vision to strengthen cooperation between different research areas and to attain high international

recognition and excellence, and especially to strengthen intrafaculty research programmes and interfaculty research cooperation. The plan is also to open the research facilities for use for purposes of direct societal importance (e.g. medical and industrial applications). This would increase the external funding needed for regular maintenance and renewal of the high-quality infrastructure.

Staffing

The Department experienced significant generational change between 2010 and 2017, when five out of 17 professors retired, and eight new professors were hired. One further professor will retire in 2018. The recruitment process follows the general practices of the University including international scoping and equal opportunities for candidates. However, the text describing the requirements in the present official documents appears overly stringent and should be reformulated because it might deter potential applicants. There is a serious need for a redesign of the tenure track system including transparent and clear criteria and mechanisms for promotion. A new system would help to attract both national and international skilled, qualified and motivated young scientists to apply for these positions. A transparent tenure track system would be helpful also in career planning and in the recruitment of female scientists.

The Department has successfully recruited international staff members at all stages of the research career (23% of professors, 21% of Senior Researchers, 63% of Postdoctoral Researchers and 27% of Doctoral students are from outside Finland). However, the recruitment of female researchers has not succeeded well in our view. We noticed that the proportion of female staff members follows a pattern from 21% of PhD students to 0% of professors, Senior Lecturers and lecturers. It seems that female applicants have a better rate of success when they apply for external funding from the Finnish Academy (for senior fellowships) – where decisions are based purely on scientific merit. So perhaps the Department should investigate if there are any hidden barriers in its staffing strategy that creates this imbalance. In addition, to increasing the number of female staff members, the Department should follow the rule valid in the Department of Chemistry, namely that given equal merit, a candidate of a minority group is selected.

The Department has about 20 different research groups working in the two main research fields, i.e. subatomic physics and materials physics. The research groups are highly autonomous in respect of content of their research, raising external funding and even in recruiting personnel at the level of Doctoral students and post-doctoral researchers. The group leaders, mostly Professors, have the primary responsibility for the quality of research and selection of research topics within their individual fields.

Development for career young academics

There should be a multi-/interdisciplinary doctoral school that organizes/coordinates doctoral training, joint seminars and other activities and collegial events. The doctoral school would help PhD students to get to know and encourage each other, and to network. In the interview session it appeared that the PhD students did not know much about the doctoral school or the doctoral programmes in the Faculty. At a

practical level the supervision and co-supervision of Doctoral students is undertaken within research groups and the students seemed satisfied with the level of supervision and mentoring they receive. International M.Sc. programmes help to encourage international students to continue on to study for a doctoral degree. The annual organized, and widely advertised, Jyväskylä Summer School provides visibility and a means for the recruitment of motivated Doctoral students. Most of PhD students and postdoc researchers are funded on a salary basis by external sources, but those funded by the Foundations have almost the same rights.

Research development for senior academics

The Department of Physics forms a single unit with low borders between the different research areas and groups. There are weekly colloquia, which attract 50–100 researchers at every stage of their research careers regardless of the topic. In addition, weekly topical seminars are actively attended by members of different groups, and even by those from other departments, facilitating a positive research ethos. However, there is the need for courses targeted at personal development skills.

Research infrastructure

The panel members were impressed by the significant infrastructure hosted by the Department of Physics. The Academy of Finland (AoF) grant funding for research infrastructure on Finland's roadmap for national research infrastructure, such as the Accelerator Laboratory of the University of Jyväskylä (JYFL-ACCLAB) which is one of the largest research infrastructures in Finland. The AoF infrastructure funding requires a minimum of 30% funding to come from the host University. The roadmaps were evaluated in 2017 and the infrastructures were classified according to their level of advancement. JYFL-ACCLAB was assessed to be at an advanced level. Every year, hundreds of scientists from universities, laboratories and private companies around the world use these research facilities. The development of the infrastructure is driven by the needs and scientific goals of the user community and by research groups at the University of Jyväskylä. Informative details are found on the laboratory webpages describing the facilities available within the laboratory, together with information on how to gain access to beam time, and the contact details of the laboratory staff. In addition to JYFL-ACCLAB, the modern cleanroom facilities of the Nanoscience Centre are available.

Although funding for the valuable JYFL-ACCLAB is from a range of different sources and staff members have the expertise needed to undertake the many responsibilities, extra funding is needed for the overall operating costs, critical maintenance needs, instrumental upgrading costs, occasional larger repairs and the purchase of new parts, instruments and/or facilities. The same needs are related to the facilities at the Nanoscience Centre and other infrastructures, such as X-ray tomography. The Department is in need of a buffer or to be allowed to carry over funds to the following year. The best approach is to develop a sustainable, stable and coherent funding model/infrastructure strategy including funding mechanisms at the University level to and allocate back a part of the money taken from the Departments/faculty overheads to research infrastructures and their maintenance.

CSC-IT Centre for Science that provides world-class ICT expert services for research and education is helpful in relation to computational studies and to participation in the national FIRI roadmap - the Finnish Grid and Cloud Infrastructure (FGCI); a computational infrastructure consortium of nine universities, which will be upgraded to stage two clusters in 2018.

Publication strategy
During the assessment period the number of the scientific publications in scientifically highly ranked journals increased without sacrificing the scientific quality. Although the Department encourages its members to publish their results in journals with the highest possible impact factor, researchers and research groups make the final decision about the journal themselves. The Department belongs to the top units nationally in open-access publishing (83 % of the 2017 publications are open access). The open access process is managed by the University library.

Research/teaching/administration balance
Lecturers are mainly responsible of teaching. However, every lecturer in the Department is also a researcher, which maintains the close connection between the teaching and state-of-the art science. The Department aims for a balanced workload in teaching. The Department uses different methods in courses (integrated with experiments, carried out by instruments, literature club-type courses, team working etc.). Individual lecturers can select their own preferred way of teaching. No special issues/questions were raised in the interviews related to the balance between research teaching and administration.

Internationalisation
The Department has a worldwide network, with on average 250 international annual visitors, attracted by the high-quality research infrastructures. Interestingly, the researchers in the Department are also active in visits outside the University.

Outreach and impact
Dissemination and the popularization of scientific results have played an important role of the Department's outreach to the general public. The Department has been involved in several highly popular science events, which have attracted a high number of visitors. Several groups from schools have also visited the Accelerator Laboratory and the NanoScience Centre. In the autumn of 2018 a special programme focusing on science will start in a local high school and the Department has had a substantial role in planning and running it. The Department of Physics has for several years offered the possibility for high-school students to work for one month with a research group(s). In addition, the Department takes part in the CERN visitor programmes, MyTech program and LUMA program.

Funding

Two ERC Grants, six Academy research fellows and one Academy professorship (jointly with the Department of Chemistry) are a clear proof of success in gaining funding and producing high quality research. In addition, the Centre of Excellence in Nuclear and Accelerator-Based Physics worked for six years until the end of 2017. External funding is mainly from the Academy of Finland, TEKES and EU, but a smaller amount of research funding (about 12%) for applied research comes from industry, the regional council of Central Finland and the Finnish Innovation Fund SITRA. The decreasing trend of core funding creates extra pressure on staff members to raise external funding for research and for maintenance and updating the research facilities. If the amount of external funding is to be increased, the University should develop stabilizing mechanism to ameliorate some of the effects of fluctuations in funding on the activities of the Department.

Future plans

The panel members support the plans to enhance and strengthen further the intra- (biologists) and interfaculty (the Faculties of Sport and Health Sciences, Information Technology and Education and Psychology) cooperation to increase social impact and new possibilities for external funding. Already about 140 annual publications are published in multidisciplinary journals, involving several different departments. In addition, new funding possibilities (Business Finland International Foundations etc.) should be sought more actively.

The plans made by the Accelerator Laboratory for the preparation of an "ACCLAB-2030" development programme, which aims to strengthen its position as a major multi-user facility for international and national researchers, is strongly supported.

6.3.10. Department of Chemistry

Are the actions well defined and do they have a clear objective?
Is the choice of proposed actions justifiable in the light of the background data?
Is the choice of proposed actions likely to lead to the target(s)?

The Department of Chemistry has a clear vision to have, within the next 5–10 years, a unified department with a clear organisation and without internal borders where research of high scientific quality is interdisciplinary and involves collaboration between different branches of chemistry. The Department should engage all of the permanent staff in this renewal of the organisation, and the leadership of the Department should follow this goal its recruitment processes. The unit should endeavour to increase the international recruitment of excellent academics at all career levels to guarantee high scientific quality and research funding for the future.

Some specific issues appeared in the self-appraisal document and/or came out during our visit, they are highlighted in what follows:

Basic research, carried out in the Department of Chemistry, is applied in four profiled, areas, 1) Renewable natural resources and chemistry of the living environment, 2) synthetic and structural chemistry, 3) chemistry education and

4) computational chemistry and spectroscopy. Five professors out of 11 hold positions in main sub disciplines of chemistry (physical chemistry, organic chemistry, inorganic and analytical chemistry, applied chemistry and chemistry teacher education) which, until 2010 determined the structure of the Department. All these sub areas of chemistry are addressed in the Department's teaching portfolio. The renewed organisation was introduced in 2018 and the staff members seem to be committed to the goal of unifying the Department in a new and better way. About half of the professors are located in the multidisciplinary Nanoscience Centre, a joint, high-standard research organisation where physicists, chemists and biologists work together to study nature at the nanoscale. Research is a central aspect of the intra- and interdisciplinary activities of the Nanoscience Centre. Computational and theoretical investigations are often used to predict and verify experimental findings.

The University's strategy has defined its profile and identified its strategic core fields. Molecular nanoscience belongs to internationally strong research areas within the core field of basic natural phenomena. Research in chemistry, and especially in the field of supramolecular chemistry, is of an internationally high level, and the number of papers has increased in high-standard peer-reviewed journals, and especially in highly ranked multidisciplinary chemistry journals. As markers of high-standard research, there are: an ERC Consolidator Grant, three Academy research fellowship posts and one Academy professorship (jointly with the Department of Physics). There are active international collaborations as well as collaboration within the University of Jyväskylä, and members of the Department are encouraged to find inter-faculty collaborators. Intrafaculty research is mainly related to nanoscience and bioresource research. Researchers from the Department of Chemistry are involved in a new initiative of the University - Wisdom, which is a network of researchers from several faculties. In addition, Industrial collaborators play an important role in applied chemistry projects.

The plans to continue the renewal of the organisation of the Department of Chemistry aiming at a more unified department seem feasible, but the leaders should take care that all actions taken are well understood by all staff. Feedback from on-going changes should be collected and opportunities for discussion with all groups of staff should be organized. The proposed actions will increase the synergy both between and within research groups and facilitate further interactions within the unit across the University. All funding applications must identify the profile area they are associated with. Although this is a good requirement for the renewal process of the Department it might prevent the development of new innovations. However, it is good that the Department leaders have developed a realistic timescale for the new organisation to come to fruition.

Staffing

The Department has experienced a remarkable generational shift during the period 2010–2017, die to retirements. Five out of the 10 professors have been recruited in that period. In addition, one professor will retire in 2019. There is only one non-Finnish professor and only two professors are female. Although all positions were opened internationally, active headhunting was focused in Finland. There is a great need for a

redesign of the tenure track system including transparent and clear criteria and mechanisms for promotion. Such a new system would help to attract both national and international, skilled, qualified and motivated, young scientists to apply for these positions. A transparent tenure track system would also be helpful in career planning. International M.Sc. programmes encourage international students to continue their studies for a doctoral degree. The annual, and widely advertised, Jyväskylä Summer School, provides visibility and a means for the recruitment of motivated Doctoral students. Most of the PhD students and postdoc researchers are funded on a salary basis by external sources, but those funded by the Foundations have almost the same rights as those funded by salary.

Development for career young academics

There should be a multi-/interdisciplinary doctoral school that organizes/coordinates doctoral training, joint seminars and other activities and collegial events. The doctoral school would help PhD students to get to know and encourage each other, and to network. In the interview session it appeared that the PhD students did not know much about a doctoral school or doctoral programme in the Faculty. At practical level the supervision and co-supervision are implemented in research groups and PhD students seemed satisfied with the level of supervision and mentoring. Only some laboratories have their own written instructions for newcomers, this protocol should be available through the whole Department. Around 40% of postdoc researchers are international, but no international scientists are working as University teachers, lecturers or Senior Lecturers. The explanation here is that undergraduates are almost exclusively Finnish. However, it would be good to have more international lecturers who might then attract more international students. In addition, they would be beneficial in the supervision of international M.Sc. students and in planning the future programme. Furthermore, there are already a number of international PhD. Students in the Department who need to take courses and who would probably like to have a greater choice of courses available in English.

The percentage of women reduces from 50% Academy research fellows and lecturers to 30% postdoc researchers and 20% of Senior Lecturers to 10% of professors and even 0% in some other positions. So overall female staff members are in a minority in the Department. To improve the number of international and/or female staff members, the Department has decided to select, given equal merit, a candidate from a minority group, which seems a promising strategy. New faculty recruitments must be compatible with the profile areas or with emerging new areas.

Research development for more senior academics

The Department offers mobility possibilities via bilateral mobility and teaching programmes. Project PIs and/or supervisors of PhD students contact international research groups to make plans for shorter or longer visits for PhD students, postdoc researchers and senior staff members. But a better and more transparent research leave/research visit system including a better mentoring system for ambitious PhDs to apply for a post-doctoral fellowship to conduct research abroad is needed.

Research infrastructure

A modern infrastructure is essential for high-standard chemistry research and effective chemistry-based education. The overall operating costs, critical maintenance needs, instrumental upgrading costs and the purchase of new instruments and facilities need a more coherent and stable funding model. The Department is in need of a buffer or to be allowed to carry over funds from one year to the next. The best approach is to develop a sustainable funding model/program at University level and allocate a part of the overhead money taken from the faculty back to pay for research infrastructure and maintenance. Fortunately, computational studies can be performed by utilizing the CSC-IT Centre for Science that provides world-class ICT expert services for research and education.

Publications strategy

The aim is to publish the results achieved in high-impact, internationally highly ranked peer-reviewed journals. The Department encourages researchers to also publish their results in an open access format, by exploiting options offered by the University of Jyväskylä. The open access process is managed by the University library, but some extra financial help from the Department would be beneficial to support these costs. The standard of the publications coming out of the Department is of a high scientific standard.

Research/teaching/administration balance

Professors in sub disciplines are responsible for the teaching arrangements within their area. Lecturers, Senior Lecturers and University teachers undertake most of the teaching, but PhD students take also take part in teaching B.Sc. and M.Sc. students. Part of the teaching is linked to research projects within the B.SC. and M.Sc. degrees, carried out in laboratories and in research teams. University teachers would be more motivated if they had time for writing funding applications could be taken into consideration in their work allocation. Success in research funding should result in less teaching, but there must be an equitable mechanism for dealing with this.

Internationalization

The Department has many flourishing international collaborators, resulting in joint publications. The Department should increase the international recruitments at all career levels. International researchers visit the Nanoscience centre frequently and form an excellent platform for networking and furthering existing and new research cooperation.

Outreach and impact

The applied research at the Department of Chemistry is of societal importance in areas, such as forest, pulp and paper, and mining industries combined with aspects of biorefining, environmental chemistry, recycling, and renewable energy all of which are at the centre of the Department's of research activities. These research projects aim to utilize renewable biomass resources by means of green technology and to develop the processes and chemical analyses in collaboration with the industrial partners.

Funding

An ERC Consolidator Grant, three Academy research fellowship posts and one Academy professorship (jointly with the Department of Physics) are proof of success in funding and excellent research. During the evaluation period, another Academy professorship was awarded, for 8 years. External funding comes mainly from the Academy of Finland, TEKES and the EU. A smaller amount of research funding for applied research comes from industry, the regional council of Central Finland and the Finnish Innovation Fund SITRA.

Future plans

The Department has the ambition to form a unified and clear unit without internal borders in the coming years. Its research is focused on four profiled, strength research areas, 1) Renewable natural resources and chemistry of the living environment, 2) synthetic and structural chemistry, 3) chemistry education and 4) computational chemistry and spectroscopy. The research on Molecular nanoscience belongs to internationally strong research areas within the core field "Basic natural phenomena", which is mentioned in the University's strategy. The leadership of the Department follows this vision by ensuring that faculty recruitment supports and strengthens the profile areas or emerging new areas, and by ensuring that funding applications are clearly identifies with a profile area. This kind of protocol helps to achieve the target, but at the same time, if pressure is to great, it can negatively affect the working atmosphere in the department.

6.3.11. Department of Biological and Environmental Science

This report has been written with three overarching questions posed by the University of Jyväskylä's (henceforth the University) in mind. Specifically

- Are the actions described in the self-appraisal document (SAD) well defined and do they have clear objectives?
- Is the choice of proposed actions stuitable in the light of the background data?
- Is the choice of proposed actions likely to lead to the target(s)?

By way of background, Biological and Environmental Science is a large department that underwent restructuring in 2017, when 4 divisions (Aquatic Sciences, Cell and Molecular Biology, Ecology and Evolutionary Biology, and Environmental Sciences) were restructured into 2 new divisions (Biosciences and Natural resources and environment). The research programme of the Department covers a wide range of topics at a number of levels ("from atoms to ecosystems"), which is a strength. Core research areas within this general research programme are identified as Evolution, Natural resources and the environment and Biological Nano sciences. The Department has been steered through this reorganisation by a strong, democratic management, has performed very well during the assessment period with respect to the key indicators and is now working to ensure that this continues.

In the text below we highlight points raised in the SAD and during the site visit, comment on some additional issues and suggest some actions that might be taken to improve the Department's research output and ensure scientific renewal.

Staffing

The Department is one of the largest in the University, with a steady number of between 13 and 15 professors during the assessment period. In terms of equality, while the gender balance overall is good, there is the usual picture of the proportion of women falling off at senior levels. During the assessment period, the Department has conducted a successful programme of recruitment and good plans are in place for renewal. The department is currently seeking to fill two posts, advertising these at either full or Associate Professorial level. They have been struggling with the current tenure track system, as it is inflexible and delays appointments; the panel understands that the tenure track system is under review at University level. The Department starts planning five years ahead of a given retirement about filling the post; the ability to appoint at tenure track associate lectureship levels would greatly facilitate this process. Concern was expressed that tenure track academics have an advantage over older more established colleagues without tenure when it comes to career progress. There is a general concern the falling recruitment of undergraduate students on biology courses, with knock on effects for recruitment at all levels. This emphasizes the importance of having a clear, attractive presentation of the Unit's research strengths (see below). The WISDOM project (see below) could well act as a catalyst here, as it addresses many issues about which young people are rightly concerned.

Development for career young academics

The Department has a flourishing programme of training and development for young academics. The meeting with young researchers was very positive. The postgraduate (PG) students and post-docs came to the Department by different routes, some having been home grown at the University and others arriving in response to adverts for position on projects. We were very impressed by their positive attitude and the high level of satisfaction expressed about their experience in the Department.

We note that PG students are required to have a realistic financing plan in place for a four-year period of postgraduate study before being allowed to start their training. This is a very good policy and reduces the severity of the 'two-tier' system for PG students, although it does not remove it altogether. Concern was expressed about inequalities in relation to health insurance and in ability to attend taught courses (students who are on the University's payroll get priority on over-subscribed courses). There was agreement that it is best to receive doctoral training as part of a larger project. Those in smaller groups may experience some pressure to raise money to support the group, but this is viewed as a potentially useful experience.

Very good mentorship systems are in place for both PG students and post-docs, offering a clear route to get help with problems with supervisors and for careers advice. The structure and the geography of the unit mitigate somewhat against interaction between groups (there are apparently separate coffee rooms on different floors, though the panel understands that this is changing), but the group we met seemed to know each other and interact well. Mobility opportunities are good. The Department and the University provide exceptional support with grant preparation, especially but not exclusively for ERC funding.

The PG students carried out their own survey of how much teaching they all do (an impressive initiative) and found considerable variation; on average students might spend ca 10% of time on teaching. In this context, they commented that, while general courses are available to support teaching, pedagogy courses specifically tailored for PG students should be available to be taken before they do any teaching. These should be sufficiently well supported to give everyone who needs one a place on the course. We note that the University graduate school is not particularly on their radar screen.

Good support is in place at the department level at for international students, but non-Finnish speakers would like courses to be translated into English sooner and important notices around campus to be in English as well as in Finnish.

Funding

The Department has a very good record of attracting external funding during the evaluation period, this making up ca 50% of the total budget, with, among other impressive achievements, considerable funding from the Academy of Finland and the ERC. The stated strategy for the future is to increase external funding, especially from the EU. Various systems are in place at Departmental to help with funding applications. For example, a mentoring system is being developed and recruitment is aimed at personnel with a strong track record in gaining competitive research funding. Possibilities for attracting funding from industry or NGOs were discussed, as additional sources should funding, from sources such as the Academy of Finland, fall off. The panel's opinion is that it would be appropriate to identify what expertise the Department has to offer in this context (there are many impressive possibilities) and to market this.

Research development for more senior academics

There is no systematic assessment of performance for more senior academics, this being "outsourced to the external reviewers of research papers and research proposals"; development of a more structured system might help the Department's research goals to be achieved. The important issue of research leave is discussed below (under research/teaching balance). In terms of post award support, experience is that the new centralised administration systems provide worse research support that their in-house predecessors, though we note that the University is aware of this and has it in hand. In terms of infrastructure, much is shared across the Faculty, which is good. The Department recognises a strong need to raise the level of funding for infrastructure, both equipment and trained technical staff.

The Konnevesi Research Station is clearly a valuable and much-valued resource. The station, including the animal houses, needs refurbishment and the University's list of necessary plans includes a general development to bring the station up to modern requirements. In this context, in moving the project forwards it would be helpful to assess and publicise just how much the station helps researchers to leverage external research. Gaining external funding for such a major development is a different operation from more usual grant applications. The panel's opinion and experience are that approaching alumni who have experienced teaching/research at the station could

well elicit support; this is probably best done using University-level fund raising mechanisms.

Publications strategy
During the period of assessment, the Department's publication profile has been very strong, with a high and increasing number of scientific publications in peer reviewed journals, a significant proportion with national and international collaborators, and increasing citation levels. The aim for the future is for researchers to publish in journals that that give maximum international exposure and maximum impact. This is entirely appropriate, but the SAD contains few details of how this is to be achieved.

Research/teaching balance
The Department supports BSci. Programmes in Biology and Natural Resources and Environment and MSci. programmes in Aquatic Sciences, Ecology and Evolutionary Biology, Cell and Molecular Biology and Environmental Sciences. These titles suggest that these degrees may be based largely on pre-2017 Departmental structures. There are no research-only contracts among University-funded staff and all staff carry out some teaching, including doctoral supervision. Teaching is allocated to 'optimise rather than equalise research time' and staff with large research grants are allocated relatively little teaching. Overall, the experience is that teaching (and administrative) commitments compromise research output. The Department seeks to organise teaching so that staff have teaching-free periods each year but reports a strong need for a better and better-funded programme of research leave at the University level. The panel recognises the breadth of the Department's biological interests but believes it would be in the interests of its research programme to explore whether the overall quantum of teaching is too high and whether any of the current courses could be merged or more content shared.

Internationalisation
Overall, the Department has a very good network of collaborations at many levels, among its own 3 research groupings, with other University departments and with other institutions in Finland. In an international context, Department staff collaborate with prominent universities and other institutions in Europe and worldwide. Between 12 and 37% of research students and staff at various levels are international and the Department contributes to several international Masters courses. The Department reports several factors that work against attracting international researchers. It is effectively impossible to recruit to 5-year tenure track appointments people who have permanent posts already in another country. In the same vein, longer contracts for Post Docs would help to attract international candidates. As discussed above, support is needed at the University level to smooth the paths of PG students and other researchers from abroad. It is not clear from the SAD whether and to what extent the Department makes use of Visiting Professorships, which represent a valuable way of promoting international research contacts. The Department itself could potentially help international recruitment by raising the profile of their internationally recognised research groups (see below).

Outreach and impact

The academic expertise of Department staff is in demand in many areas of governance and administration in Finland and several specific research areas have important social impact in areas ranging from the conservation of biodiversity to improving understanding of muscle disfunction in patients with muscular dystrophy. As another example of successful outreach, departmental researchers provide material for a regular section on biological issues for a leading regional newspaper. Departmental research gains good media coverage and the Konnevesi research station hosts public events of various kinds. The department aims to increase its societal engagement in the future but recognises that not all researchers are gifted in outreach activities.

Profiling versus bottom up and blue skies

The Department's research maps onto several profiling themes and its staff are generally in favour of profiling, as fostering collaboration. The University pushes/guides, but as the Department has a good track record of getting money they see themselves as able to do their own profiling. Concerning the University-wide, multi-disciplinary network WISDOM, all the staff to whom we spoke were enthusiastic about this theme, which is seen as promoting the use of top ranking, interdisciplinary science to address big societal issues.

Future plans / horizon scanning

The SAD provides a clear account of the effective strategic planning that has been in place during the period of assessment. The strategy for the future is largely formulated as an extension of these activities or as generic aims. These are all appropriate, but rather few clear actions are presented for implementing them. Having responded successfully to the challenges of the 2017 organisational changes, the time is probably right for some more proactive strategic planning in terms of how the Department's research should develop in, say, the next 10 years.

Conclusions

Concerning the University's overarching questions, the SAD describes many appropriate actions and objectives that are well justified by the background data and will, in general terms, move the Department towards its identified targets. As above, these actions are somewhat generic in nature and could usefully be more detailed and focused.

A number of factors that constrain development of the Department's research programme were raised in the SAD and during the site visit and have been discussed in the previous sections.

One action that could help the Department in promoting and advertising its research is to reconsider the structure and naming of its research themes, which seem to be described in slightly different ways in the SAD and the Department's website. For example, the description of the Evolution research theme is very broad and does not give the outside world a clear picture of group's very considerable research strengths. The panel recognizes the difficulty of forging an integrated research programme out of disparate research groups and accepts that this structure may be an

interim solution. A systematic analysis of connectivity within the Department (already going on at the Faculty level) would allow real and potential collaborations to the identified and fostered and would help to identify names for all the research grouping that inform and excite people from outside looking for places in which to carry out a particular kind of research.

6.3.12. Kokkola University Consortium Chydenius (KYC)

KYC is an off-campus extension of JYU in collaboration with the Universities of Oulu and Vaasa. Its main mission is to serve client organisations and students in the Kokkola region and to support the development of the region. Its student population consists mostly of adults studying part-time. Research activities are mostly applied/developmental in nature and are often supported by client organisations. Its Doctoral student community is small, graduating only 3 PhDs in 2017. Conducting scholarly, scientific research is not a part of the key mission of KYC, although research activities do appear to occur in some areas (e.g. social sciences and IT). Scientific research output in terms of publications in high quality international journals is relatively low (10 publications in JUFO 2 and 3 in 2017). As such, research at KYC differs fundamentally in nature and scale from the other academic units reviewed by the Evaluation Panel and consequentially the report on its research is relatively brief.

Regarding the three overarching questions in the self-evaluation report in the context of research, viz.:

- Are the actions well defined and do they have a clear objective?
- Is the choice of proposed actions justifiable in the light of the background data?
- Is the choice of proposed actions likely to lead to the target(s)?

The answer is generally in the affirmative. However, there are a number of observations, comments, and suggestions that the evaluation panel would like to make which might be useful as a source of input for the management of KYC/JYU in its continuous pursue to improve research output and to ensure the vitality of its research enterprise.

Staffing

KYC wants to improve the scientific quality of its research output and publish more in higher-tier outlets with broader visibility (e.g. quality international journals with large readership).

Currently, the pool of academic staff capable of doing scientific work at a high level appears to be very small. Enhancing research capacity through elevating the research ability of other staff members or recruiting established research faculty members from the open market is unlikely to yield significant results in the short/medium term. Internationally competitive research capability takes years to develop and the market for established research talents is extremely competitive.

Hence, some policy measures may be needed to ensure the very small pool of research-oriented academic staff members have sufficient support in terms of time, resources, and access to quality Doctoral students to maximize and sustain their research performance.

Ready access to industrial and/or case study empirical data is an advantage of KYC. On the other hand, scientific research capability is much stronger on main campus. Specific policy initiatives encouraging KYC professors to team up with their counterparts on main campus synergistically would be useful in pushing research to a higher level.

Doctoral students

Doctoral students at KYC appear rather isolated from the academic infrastructure on the main campus. KYC is over 240 kilometers away from main JYU. Practical access to campus resources such as research seminars, workshops, and the Doctoral student community in general seems rather limited. This situation tends to hamper the development of Doctoral students.

It is suggested that videoconferencing/streaming facilities be made more readily available to all parties to improve connectivity with and access to main campus resources and research seminars. Meanwhile the parties involved should be encouraged to actively use these facilities to enable KYC Doctoral students to better tap into the research environment/activities/infrastructure on the main campus.

It would also be useful to consider setting up a scheme, with corresponding funding possibilities, whereby KYC Doctoral students could spend a semester or half a year at JYU, in full-time mode, to allow better integration with mainstream doctoral training. The funding aspects of the scheme and the corresponding decision-making mechanisms should be made transparent and actively dissimilated to the entire Doctoral students community at KYC.

Research and publication strategy

Given the very small pool of research-oriented professors at KYC, strategic choice needs to be made to focus research on one or two selected areas to ensure critical mass and sustainability to drive up the quality of research output to the next level (e.g. producing a significantly number of JUFO 2 & 3 publications) and make a significant impact on the chosen areas.

Conclusions

Considering the specific mission and context within which KYC operates, the level of research going on in this unit is reasonable and there are signs of improvement. The management's determination to drive up the quality of research at KYC is apparent and laudable. Setting ambitious but realistic expectations, drawing on the main campus for synergies, and strengthening research by focusing on one or two selected areas, to ensure critical mass, would potentially enhance both quality and impact. In addition, Doctoral students' training could be readily improved through better integration with main campus resources.

KEY DEVELOPMENT ACTIONS IDENTIFIED BY THE EVALUATION UNITS

by

Self-evaluation teams by the units (see Appendix 1)

7 KEY DEVELOPMENT ACTIONS IDENTIFIED BY THE EVALUATION UNITS

Based on the unit's self-assessment report and the recommendations given in the external panel report, each evaluation unit wrote a detailed research development plan. The full plans will be published separately for internal use. This chapter lists those development actions for each evaluation unit that the unit has identified as being the most critical and urgent ones and which should be given the highest priority when developing the research environment of the unit.

7.1. Department of Social Sciences and Philosophy

The evaluation report identified a few development targets. In the department's action plan, the focus is on the following six most important areas of improvement

1. Need for long term research strategy including horizon scanning to develop future research areas.
2. Preparing a departmental publishing strategy.
3. Need to continue and deepen integration into the new faculty of Humanities and Social Sciences.
4. Need for more proactive leadership in finding ways to improve practices and processes at all levels of the University of Jyväskylä.
5. Recruitment and internationalisation: Internationalisation by attracting top researchers and supporting equality.
6. Need for balance between teaching, research and administration.

7.2. Department of History and Ethnology (HELA)

Identified key areas of improvement

1. Synergies among the department's research areas: Developing a more focused vision for HELA's broad research areas and synergies among them.
2. Acquisition of external research funding: Maintaining – and where possible increasing – HELA's external research funding.
3. High-quality international publications: Increasing HELA's output of high-quality international publications.
4. International contacts: Improving and extending HELA's international contacts.

7.3. Department of Music, Art and Culture Studies (MUTKU)

Identified key areas of improvement

1. A high level of external funding is to be maintained by allocating resources for funding applications, particularly in fields mentioned in the department's research strategy.
2. Publication profile will be strengthened by encouraging high-impact, co-authored, peer-reviewed, open access, and international publication.
3. Infrastructure will be developed by updating laboratory infrastructure and seeking opportunities to establish a technical support post for laboratory assistance in collaboration with JYU general infrastructure development.
4. Collaboration with leading institutions around the world are to be continued through travel grant support and making the local facilities attractive (e.g. by upgrading infrastructure, as noted in the previous point) for international experts to visit and be recruited.
5. Existing links to JYU profiling (e.g., MultiLeTe, Brain changes across the life span, Crises redefined, Physical activity through the life span, KeHO, EduFutura) will be further strengthened by elaborating and updating the department's research strategy and collaborations.
6. Common ground between former departments (merger in 2017) will be strengthened as part of research strategy development through dialogue of existing strengths (cognitive musicology, cultural heritage, and games, gaming & learning) and growing strengths (art therapies and cultural wellbeing, culture as a perspective on crises and change).
7. Visibility and impact of research strategy will be strengthened by website updates and using strategic profile in steering (grants, posts, work plans).
8. Mutual dialogue of research with teaching and impact on society will be supported by aiming for posts that are mixtures of research and teaching, involving professors of all disciplines in decision-making, and allocating time in work plans not only for JUFO-ranked publications but also for research outputs and activities relevant for practitioners and society in general.
9. Efficiency of doctoral training will be improved by identifying reasons for delays, addressing them, and paying attention to the availability of supervision competence and resources when recruiting new doctoral students.

7.4. Department of Language and Communication Studies

Identified key areas of improvement

1. Sharpening research profile: reviewing and updating current research strategy.
2. Developing supervision and support for doctoral students: continuing existing good practices and developing new ways to support doctoral students' professional and personal development.
3. Improving support for postdoctoral researchers.
4. Improving teaching–research balance for staff at different career stages.

7.5. Centre for Applied Language Studies (CALS)

Identified key areas of improvement

1. Research activities and external funding: Continue conducting high-level research that makes significant progress in the RECLAS profiling area in order to gain the status of Centre of Excellence in Applied Language Studies together with the Department of Language and Communication Studies.
2. Research activities and external funding: Engage in dialogue with the University about the research-based national mandates, including National Certificates of Language Proficiency and Finnish Network for Language Education Policies, in order to guarantee sufficient resources for high quality work.
3. Research activities: Develop ethically responsible and socially just research activities with other units by providing training and discussion forums in research ethics.
4. Supporting mobility, wellbeing and inclusion of junior researchers: Improve grant researchers' working conditions and sense of belonging in the academic community in cooperation with other units, the faculty and the university.
5. Supporting mobility, wellbeing and inclusion of junior researchers: Draft a recruitment strategy at the university, faculty and unit level in order to develop a balanced staff structure.

7.6. Faculty of Sport and Health Sciences

Identified key areas of improvement

1. High-class research environment: Continuous development of well-functioning laboratories and research infrastructure with state-of-the-art technologies and methods to support and advance high quality research.
2. Faculty's structure and administrative model: Faculty administrative model will continuously be developed to promote academic careers and to support and advance successful, equal and healthy academic culture.

7.7. Faculty of Education and Psychology & Finnish Institute for Educational Research (FIER)

Identified key areas of improvement

1. Internationalisation: Recruiting visiting associate/full professors to the faculty/FIER, increased mobility and international research environment.
2. Research collaboration and leadership: Improving leadership to support research collaboration and team-building to increase critical mass, focusing on and interlinking research on central themes.
3. The position of young academics: Supporting the doctoral students' and young academics' career prospects and opportunities for participation .
4. Support for acquiring external funding: Supporting external national and international, especially EU, funding.
5. Open science and infrastructure: Increasing open publishing and open science, developing novel technologies and infrastructure to facilitate internationally high-impact research.

7.8. Faculty of Information Technology (IT)

Identified key areas of improvement

1. Indicators for measuring the progress towards scientific excellence.
2. The improvement of capabilities for scientific excellence.

7.9. Jyväskylä University School of Business and Economics (JSBE)

Two related areas of improvement were identified, both of which are continuous and long-term.

Goal 1: Strengthen internationalisation of JSBE research (2019)
Improvement actions

1.1 Strengthen position of JSBE in international settings by receiving the initial AACSB accreditation and by continuous improvement of intellectual contributions of academic faculty (2019) (measured by international peer-reviewed publications, PhDs and competitive research funding).
1.2 Benchmark leading business schools (2018–2019) to create an internationalisation action plan for JSBE research (2019) (measures set in the internationalisation action plan).
1.3 Support the internationalisation and mobility of faculty, doctoral students and staff by fostering an international culture which encourages international mobility, international co-authoring and external competitive research funding

applications, organise a research development day for faculty (2019) (measured by mobility and competitive research funding received).

Goal 2: Clarify JSBE's research value proposition (2020)
Improvement actions

2.1 Strengthening JSBE collaboration between international partners and businesses by constructing an international advisory board for JSBE (including research) and fostering a network mentality (2019–2020) (measured by stakeholder attendance and mobility).
2.2 Establishing stronger impact and linkages with international and corporate partners in line with the new JYU strategy by developing a networking mentality and creating JSBE's research value proposition (2020) (measured by corporate collaboration and partnerships).
2.3 Establish the unique JSBE focus areas for research through evaluation and re-establishment of the thematic research groups for 2021–2024 (2020) (measured by new research groups and their foci).

7.10. Department of Mathematics and Statistics

Identified key areas of improvement

1. Outreach and staffing: Developing recruitment of talented mathematicians and statisticians at all levels.
2. Support for career paths and research development of mid-career researchers.

7.11. Department of Physics

Identified key areas of improvement

1. Promotion of female researchers in physics by removal of hidden barriers and prevention of unconscious bias favouring males in decision-making and student mentoring.

7.12. Department of Chemistry

Identified key areas of improvement

1. Organisation of the department, enhancing the unification of the department and collaboration between groups and emphasising the current research topics.
2. Increasing competitiveness of research groups via improved organisation of work contributions.

7.13. Department of Biological and Environmental Science

Based on the research evaluation, the Department of Biological and Environmental Science has selected three targets to develop:

1. To promote the next generation by systematic career development of young researchers within the doctoral programme.
2. To clarify the communication strategy by simultaneously improving communication flow within the department and finding effective ways of advertising our science more broadly.
3. To update our research strategy for a longer time-period by recognising the ever-changing world and by optimising staff research and teaching load.

7.14. Kokkola University Consortium Chydenius (KYC)

Identified key areas of improvement

1. Enhancing the research capacity to solidify the scientific quality of the research output: Strengthening the funding basis in order to provide the academic staff resources to maximise their research performance.
2. Doctoral students' integration to the scientific community: Increasing synergy with the faculties in main campuses.
3. Strengthening the research and publication strategy: Increasing multidisciplinary approach and more intensive cooperation and integration with research groups on the main campuses.

OUTLINE OF DEVELOPMENT ACTIONS AT THE UNIVERSITY LEVEL

by

The University of Jyväskylä Science Council

8 OUTLINE OF DEVELOPMENT ACTIONS AT THE UNIVERSITY LEVEL

Based on the evaluation material and the interviews during the site visit, the international evaluation panel identified a number of recurrent and overarching issues. These findings led the panel to write a section in their report in which they gave several general recommendations which should be considered at the university level rather than by individual units. The Science Council has reviewed all these recommendations, and as part of the ongoing overall strategy process, has chosen those improvement ideas that seem most critical and urgent to implement. The Science Council recommended that these actions be incorporated into the Research Development Action Plan. This chapter summarises these recommendations by the panel and outlines the development actions that the JYU should initiate in the very near future.

Recommendation 1. Support to the academic research staff should be increased. The panel recommends to increase support for research, particularly for PIs of projects which have been funded, so that academics can "maximise the time that they can spend on actually carrying out research and publishing from it." The panel also points out that in many fields researchers may need more technical, statistical, and data management support.

> **Actions:** Enhancing support for research is one of the main topics in the Research Development Action Plan, and the objective is to cut the administrative burden on researchers and provide academics with better technical, statistical and data management support services. Furthermore, the plan focuses on increasing offering in training programmes that help research staff to improve their skills in, for example, research methodologies, research ethics, communications, and research data management.

Recommendation 2. In its report the evaluation panel extensively discusses staffing, recruitment and the career system at JYU and makes several recommendations. The essence of the recommendations results from the findings that the current recruitment process does not appear to be consistent, nor transparent and it may not ensure equality. Moreover, the tenure track system is causing some "confusion across the University about what is actually possible." The panel also recommends more clarity in the nomenclature of the academic staff and calls for a situation where most of the academics would undertake a mixture of teaching and research most of the time, albeit acknowledging that teaching load could vary in relation to whether research time was covered by external funding. The panel report points out that a more transparent recruitment and career system would "position JYU as a very attractive place to work and enable the retention and recruitment of the very best staff nationally alongside encouraging international recruitment".

Action: The Research Development Action Plan acknowledges the need to clarify the recruitment and career development processes. The objective is to create an academic career model that is transparent and is based on clearly defined recruitment practices.

Recommendation 3. The University should find ways to attract more international researchers. One possibility is to establish a visiting professorship programme.

Action: One of the objectives in the Research Development Action Plan is to establish a visiting scholars programme.

Recommendation 4. Internationalisation of the University can be supported by changing the University from within. The availability of information and services in English should be developed to facilitate the integration of non-Finnish speaking staff into JYU. In the longer run, the use of both Finnish and English in all spheres of university life would make the international staff feel more welcome and would also help to balance the workload of different tasks between Finnish and non-Finnish speaking staff.

Actions: There are several objectives in the Research Development Action Plan linked to this recommendation. The University will prepare information packages that will support the recruitment of international staff to JYU as well as their integration to the University community. Some packages will also include information about the Jyväskylä region and local services which are relevant to the families of the international staff (job opportunities, schools, etc.). Systematic measures will be taken to gradually make the University a community that is truly international, one where everybody can access services in both Finnish and English and find events organised in English alongside the events organised in Finnish.

Recommendation 5. The demands for accountability of scientific research to society are not likely to diminish, and academics should be prepared to document the impact of their research, not just the scientific impact but also its social, cultural, and economic impact.

Action: One of the objectives in the Research Development Action Plan is to provide researchers with training and tools that help them to describe the social impact of their academic work. These skills are likely to increase in importance, not just in public debate, but also when submitting research proposals to funding organisations.

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APPENDICES

Appendix 1. Self-Evaluation

Self-evaluation teams by unit

Department of Social Sciences and Philosophy

Taru Haapala, Postdoctoral Researcher
Onni Hirvonen, Postdoctoral Researcher
Sirpa Kannasoja, Postdoctoral Researcher
Jari Kaukua, Professor
Tiina Kontinen, Academy Research Fellow
Teppo Kröger, Professor
Kia Lindroos, Senior Lecturer
Tapio Litmanen, Professor
Luukka Minna-Riitta, Professor, Dean, Faculty of Humanities and Social Sciences
Kati Närhi, Professor
Mika Ojakangas, Professor, Head of Department
Jari Ojala, Professor, Vice Dean (Research), Faculty of Humanities and Social Sciences
Jiby Mathew Puthemparambil, Doctoral Student
Miikka Pyykkönen, Vice Head (Education)
Tiina Silvasti, Professor, Vice Head (Research)
Sakari Taipale, Academy Research Fellow
Terhi-Anna Wilska, Professor
Mikko Yrjönsuuri, Professor

Department of History and Ethnology & Department of Music, Art and Culture Studies

Pertti Ahonen, Professor, Vice Head (Research), Department of History and Ethnology
Piia Einonen, Senior Researcher, Vice Head (Education), Department of History and Ethnology
Jaakko Erkkilä, Professor, Department of Music, Art and Culture Studies
Outi Fingerroos, Professor, Department of History and Ethnology
Heikki Hanka, Professor, Head of Department, Department of Music, Art and Culture Studies
Pasi Ihalainen, Professor, Department of History and Ethnology
Petri Karonen, Professor, Department of History and Ethnology
Raine Koskimaa, Professor, Department of Music, Art and Culture Studies
Juha-Antti Lamberg, Professor, Department of History and Ethnology
Minna-Riitta Luukka, Professor, Dean, Faculty of Humanities and Social Sciences
Tuuli Lähdesmäki, Academy Research Fellow, Department of Music, Art and Culture Studies

Heta Marttinen, Postdoctoral Researcher, Department of Music, Art and Culture Studies
Jari Ojala, Professor, Vice Dean (Research), Faculty of Humanities and Social Sciences
Henna-Riikka Peltola, University Teacher, Department of Music, Art and Culture Studies
Suvi Saarikallio, Senior Researcher, Vice Head (Research), Department of Music, Art and Culture Studies
Petri Toiviainen, Academy Professor, Department of Music, Art and Culture Studies
Heli Valtonen, Senior Researcher, Head of Department, Department of History and Ethnology

Department Language and Communication Studies (LaCos) & Centre for Applied Language Studies (CALS)

Mia Halonen, Senior Researcher, CALS
Ari Huhta, Professor, CALS
Jarmo Jantunen, Professor, LaCos
Tommi Jantunen, Academy research fellow, LaCos
Saara Jäntti, Postdoctoral Researcher, LaCos
Leila Kääntä, Senior Lecturer, LaCos
Sirpa Leppänen, Professor, LaCos
Minna-Riitta Luukka, Professor, Dean, Faculty of Humanities and Social Sciences
Mika Lähteenmäki, Professor, Head of Department, LaCos
Outi Merisalo, Professor, LaCos
Tarja Nikula-Jäntti, Professor, CALS
Jari Ojala, Professor, Vice Dean, Faculty of Humanities and Social Sciences
Åsa Palviainen, Professor, LaCos
Sari Pietikäinen, Professor, LaCos
Arja Piirainen-Marsh, Professor, Vice Head, LaCos
Anne Pitkänen-Huhta, Professor, LaCos
Sari Pöyhönen, Professor, Vice Head of Department, CALS
Ulla Richardson, Professor, CALS
Taina Saarinen, Senior Researcher, Head of Department, CALS
Anu Sivunen, Professor, LaCos
Turo Uskali, Senior Researcher, LaCos

Faculty of Sport and Health Sciences

Janne Avela, Professor
Reijo Bottas, Senior Lecturer
Neil Cronin, Associate Professor
Pilvikki Heikinaro-Johansson, Professor
Ari Heinonen, Professor, Dean
Jaakko Hentilä, Doctoral Student
Heikki Herva, Head of Faculty Administration
Mirja Hirvensalo, Professor, Vice Dean

Arja Häkkinen, Professor
Keijo Häkkinen, Professor
Hannu Itkonen, Professor
Taija Juutinen, Professor
Heikki Kainulainen, Professor
Teppo Kalaja, Lecturer
Katja Kokko, Research Director at GEREC
Sami Kokko, Senior Researcher
Antti Laine, Senior Lecturer
Eija Laakkonen, Academy Research Fellow
Petri Laaksonen, Student
Jari Laukkanen, Associate Professor
Taru Lintunen, Professor
Donna Niemistö, Doctoral Student
Antti Löppönen, Student
Laura Nurmi, Student
Taina Rantanen, Professor
Minna Rasinaho, Education Coordinator
Pauli Rintala, Professor
Päivi Saari, Head of Student and Academic Affairs
Ritva Sakari, Education Coordinator
Sarianna Sipilä, Prof, Vice Dean
Tuuli Suominen, Doctoral Student
Arja Sääkslahti, Senior Researcher
Ina Tarkka, Senior Researcher
Jorma Tynjälä, Lecturer
Hanna Vehmas, Senior Lecturer
Piia Viitanen, International Coordinator

Faculty of Education and Psychology (FEP) & Finnish Institute for Educational Research (FIER)

Maarit Alasuutari, Professor, FEP
Piia Astikainen, Senior Researcher, FEP
Kaisa Aunola, Professor, Vice Head of the Department of Psychology (Education), FEP
Kaija Collin, Senior Researcher, FEP
Sirpa Eskelä-Haapanen, University Lecturer, Head of the Department of Teacher Education, FEP
Janne Fagerlund, Doctoral Student, Project Researcher, FEP
Taru Feldt, Professor, Vice Head of the Department of Psychology (Research), FEP
Leena Halttunen, University Teacher, Head of the Department of Education, FEP
Jouni Helin, Project Researcher, FIER
Juha Holma, Professor, Head of the Department of Psychology, FEP
Mari Huhtala, Postdoctoral Researcher, FEP

Katriina Hyvönen, Senior Researcher, FEP
Päivi Häkkinen, Professor, Vice Director (Research), FIER
Jarmo Hämäläinen, Senior Researcher, FEP
Raija Hämäläinen, Professor, FEP
Jaana Kettunen, Research Coordinator, Vice Director (Personnel), FIER
Noona Kiuru, Associate Professor, FEP
Aarno Laitila, Professor, FEP
Raimo Lappalainen, Professor, Vice Dean (Education), FEP
Antti Lehtinen, Postdoctoral Researcher, FEP
Paavo Leppänen, Professor, Vice Dean (Research), FEP
Marja-Kristiina Lerkkanen, Professor, Vice Head of the Department of Teacher Education (Research), FEP
Tarja Liinamaa, Lecturer, Vice Head of the Department of Education, FEP
Miika Marttunen, Professor, FEP
Saija Mauno, Senior Researcher, FEP
Riitta-Leena Metsäpelto, Senior Researcher, FEP
Simo Monto, Senior Researcher, FEP
Kari Nissinen, Senior Researcher, FIER
Miriam Nokia, Senior Researcher, FEP
Terhi Nokkala, Senior Researcher, FIER
Eija Pakarinen, Associate Professor, FEP
Tiina Parviainen, Senior Researcher, Director of Jyväskylä Centre for Interdisciplinary Brain Research (CIBR), FEP
Markku Penttonen, Senior Researcher, FEP
Anna-Maija Poikkeus, Professor, Dean, FEP
Johanna Rantanen, Senior Researcher, FEP
Miika Risku, Head of Institute, FEP
Niina Rutanen, Associate Professor, FEP
Anna Rönkä, Professor, Vice Head of the Department of Education (Research), FEP
Hannu Savolainen, Professor, FEP
Eija Sevon, Postdoctoral Researcher, FEP
Taru Siekkinen, Project Researcher, FIER
Mirja Tarnanen, Professor, FEP
Päivi Tynjälä, Professor, FIER
Ulla Maija Valleala, Senior Lecturer, Vice Head of the Department of Teacher Education (Education), FEP
Mikko Vesisenaho, Senior Researcher, FEP
Helena Viholainen, Senior Lecturer, FEP
Jouni Viiri, Professor, FEP
Mari Vuorisalo, Senior Lecturer, FEP
Jussi Välimaa, Professor, Director, FIER
Jan Wikgren, Senior Researcher, FEP

Faculty of Information Technology

Timo Hämäläinen, Professor
Lauri Kettunen, Professor
Tommi Kärkkäinen, Professor
Tuomo Rossi, Professor
Mikko Siponen, Professor, Vice Dean (Research)
Naomi Woods, Postdoctoral Researcher

Jyväskylä University School of Business and Economics

Tommi Auvinen, Senior Lecturer
Mika Haapanen, Professor
Vilma Luoma-Aho, Professor, Vice Dean (Research)
Katja Mielonen, Coordinator
Juha Munnukka, Senior Researcher
Kirsi Murtosaari, Head of Faculty Administration
Mirva Peltoniemi, Senior Researcher
Hanna-Leena Pesonen. Professor, Dean
Antti Rautiainen, Associate Professor
Marjo Siltaoja, Senior Researcher
Niina Simanainen, Head of Student and Academic Affairs
Jutta Viinikainen, Professor

Department of Mathematics and Statistics

Geiss Stefan, Postdoctoral Researcher
Julin Vesa, Academy Research Fellow
Juutinen Petri, Professor, Vice Head of Department
Karvanen Juha, Professor
Kilpeläinen Tero, Professor, Head of Department
Koskela Pekka, Professor
Le Donne K. Enrico, Associate Professor
Parviainen Mikko, Senior Lecturer
Rajala Tapio, Academy Research Fellow
Salo Mikko, Professor
Taskinen Sara, Senior Lecturer
Vihola Matti, Academy Research Fellow

Department of Physics & Department of Chemistry

Ari Jokinen, Professor Vice Dean, Department of Physics
Karoliina Honkala, Professor, 1st Vice-head of the Department of Chemistry
Hannu Häkkinen, Academy Professor, Department of Physics
Elina Kalenius, Academy Research Fellow, Department of Chemistry
Anu Kankainen, Academy Research Fellow, Department of Physics
Markku Kataja, Professor, Head of the Department of Physics
Jukka Maalampi, Professor, Department of Physics
Marko Melander, Postdoctoral Researcher, Department of Chemistry
Heikki Mäntysaari, Postdoctoral Researcher, Department of Physics

Risto Ojajärvi, Doctoral Student, Department of Physics
Timo Sajavaara, Professor, Vice Head of the Department of Physics
Mika Pettersson, Professor, Head of the Department of Chemistry
Kari Rissanen, Professor, Department of Chemistry
Ville Saarnio, Doctoral Student, Department of Chemistry
Jussi Toppari, Associate Professor, Department of Physics
Heikki Tuononen, Professor, Department of Chemistry
Ari Väisänen, Senior Lecturer, Department of Chemistry

Department of Biological and Environmental Science

Andreas Eriksson, Doctoral Student
Lutz Fromhage, Academy Research Fellow
Ville Hoikkala, Doctoral Student
Janne Ihalainen, Professor, Head of Department
Juha Karjalainen, Professor
Emily Knott, Professor, Vice Head
Janne Kotiaho, Professor
Jussi Kukkonen, Professor
Anna Kuparinen, Academy Research Fellow
Leena Lindström, Professor, Vice Head
Johanna Mappes, Professor
Varpu Marjomäki, Lecturer
Hannu Pakkanen, Laboratory Engineer
Lotta-Riina Sundberg, Academy Research Fellow
Jari Ylänne, Professor
Hannu Ylönen, Professor

Kokkola University Consortium Chydenius

Magnus Björgren, Project Manager (health sciences)
Ismo Hakala Professor (information technology)
Juha Hakala, Professor (education)
Anne Jokela, Head of Development
Jouni Kaipainen, Senior Researcher
Paula Kivinen, Education Coordinator (business studies)
Ulla Lassi, Professor (applied chemistry)
Sari Lehto, Education Coordinator (Open university)
Aila-Leena Matthies, Professor (social sciences)
Tanja Risikko, Director
Ulla Rosenqvist, Senior Researcher
Raine Valli, University Lecturer (education)

The Self-evaluation template

Guidelines

The template is to be completed by the evaluation unit (in English, one per evaluation unit) and submitted no later than May 15th 2018 to research-evaluation@jyu.fi. When preparing the self-evaluation, each evaluation unit is encouraged to involve researchers at all the different stages of the research career in the preparation of the self-evaluation.

Each evaluation unit organises the preparation of the self-evaluation but facilitated self-evaluation day will be organised for each unit between 3.–4.4. and 9.–27.4. A group of external facilitators will participate in these events. During the day, experts from the Strategic Unit are at your disposal when you want to elaborate the topics in the self-evaluation questionnaire and/or its background materials. Please inform us by filling in the Doodle form at doodle.com/poll/xyeichsy93y753m4 which dates in April would be the most convenient for your evaluation unit to organise the self-evaluation day (Deadline: 23.3.). The suggested maximum size of the group involved in the self-evaluation day is about 18, consisting of the Dean, Vice Dean for research, Heads and Research Vice Heads of the Departments, representatives of research groups (PIs), profiling areas, Researchers and Doctoral Students.

When considering the topics, please do not only focus on the outcomes of your evaluation unit but also describe processes (e.g., researcher recruitment) and research environment. The evaluation period extends from 2010 through 2017. Since Doctoral Student training was evaluated in 2016, the template does not include specific questions regarding this topic. Please note that the external expert panel will use the self-evaluation reports as one information source when evaluating the state of the research environment and the proposed development actions. Therefore, it is vital that each unit writes an analytical and critical self-evaluation. Support your conclusions by referring to the results from the bibliometric analysis, other aggregated statistical data for the evaluation unit, "Teaching, research and career survey at the University of Jyväskylä", and any other information source that you find relevant. If you enclose additional materials to the self-evaluation report, please note that it should be in English as the expert panel is international. When writing your self-evaluation, keep in mind that the expertise areas of the panel members, albeit multi-disciplinary, do not cover all disciplines of the University. The recommended length of the text in each topic is between half and one page.

The self-evaluation template has 11 topics that you are expected to evaluate from the perspective of your evaluation unit. When writing your self-evaluation report, you should put more emphasis on those topics, key factors, which your unit find particularly important and meaningful in enhancing high quality research and renewal. In terms of your choices, you are asked to consider the following questions or aspects:

- How are you currently working to make each key factor contribute to high quality research and renewal?

- What strengths and weaknesses do you see in your current approach?
- In what way could your current approach be further improved?
- Are there any other ongoing or planned new initiatives?
- Please, focus primarily on what can be done – and improved – by the unit itself. In addition, you may suggest changes that have to be decided upon – or made – at other levels within the university (e.g. the Faculty or the University level), and/or by external bodies (e.g. changes in government regulations, policies of funding agencies).

The questionnaire is adopted with modifications from:

Malmberg A., Kettis Å. & Maandi C. (Eds.) 2017. Quality and Renewal 2017 (Kvalitet och förnyelse 2017): Research Environment Evaluation at Uppsala University. Uppsala, Uppsala University, Sweden, 703 p.

Name(s) of the department(s):

Web pages of the department(s):

1. Background

a. Describe briefly how the evaluation unit is organized in terms of:
• Departments, divisions, disciplines/sub disciplines, research centers, The Academy of Finland's Centres of Excellence
• Formal department leadership (board, head(s), etc.)
•Changes in the evaluation unit during the period of 2010–2017. What are the organisational changes and major changes in personnel within the unit?

b. Describe briefly:
• Research profiles, strategies and plans in the evaluation unit
• Current plans on new research initiatives (major new projects etc.)
• Where the unit aspires to be in 5–10 years' time with regard to its research, i.e. your vision for the medium-term future.

2. Topics

2.1 Recruitment

How your current recruitment process aims to ensure that recruitment contributes to high quality research, renewal and maintaining a critical mass at all stages of research career (e.g., recruiting and attracting the best people, opening new fields of research, recruiting outside the JYU and from abroad)? Are there internal career opportunities, which aim to decrease the potential risk of losing talented researchers? How is equal opportunities of potential applicants ensured? Suggestions for improvement?

2.2 Career and mobility

How are you currently working to support researchers to sustain their active career paths, to promote career development and to stimulate mobility (researchers in all career stages)? What support do you offer for international collaboration which might boost career development? How do you ensure equal opportunities for all researchers? Suggestions for improvement?

2.3 Research leadership

a. Department level
Describe how research leadership is organized (the role of the board, department head, other constellations, individual research group leaders, etc.). Suggestions for strengthening research leadership?

b. Faculty/disciplinary domain/university level
How do you perceive that the leadership at the faculty/disciplinary domain/university level works to support high quality research and renewal? Suggestions for improvement?

2.4 Profiling areas and emerging areas

How do you take into account the current profiling areas or emerging areas when planning your actions to improve the quality of research and actions for renewal? How do you exploit these in recruitment?

2.5 Academic culture

How are you currently working to nurture a culture that is conducive to high quality research and renewal (e.g., with regard to intellectual interaction, collegiality, equal opportunity, creativity, ambition, scientific conduct, research integrity)? How do you encourage and facilitate the researchers to apply the open science principles and practices such as parallel publishing, making data, material, metadata and methods widely available for reuse? How do you ensure that the early stage researchers (Doctoral Students and postdocs) in your unit are well familiarized with and follow the principles of the responsible conduct of research, ethical principles, and legislation relating to their research? Suggestions for improvement?

2.6 Infrastructure (including administrative support and materials bank)

How are you currently working to maintain and develop the infrastructure in order to support high quality research and renewal? How do you handle the research data in different phase of the research process Suggestions for improvement?

2.7 Funding

Please describe your current funding situation and strategy for applying/obtaining external research funding. Based on what criteria do you allocate the core funding (yliopiston perusrahoitus) within the faculty/department? What measures have you taken or planned to take to maintain the sufficient level of external funding? Suggestions for improvement?

2.8 Cross border collaboration including interdisciplinary collaboration

a. Collaboration and networks with other universities and research institutes
Which are your most important collaboration partners? How are you currently working to establish and maintain external collaboration and networks with other universities and research institutes to support high quality research and renewal? Suggestions for improvement?

b. Collaboration within the University of Jyväskylä

Are you striving for collaboration within the University of Jyväskylä to strengthen research quality and renewal? If not, why? If you are involved in multi-disciplinary profiling areas, are you actively enhancing close research collaboration with other disciplines which are partnering in the same profiling area? Suggestions for improvement?

c. Non-academic collaboration and public outreach activities

What are your most important collaboration partners outside the academia (e.g., companies, cities)? How are you currently working to establish and maintain such collaboration and networks, and to realise wider dissemination of research results to the rest of society? What are your current approach to stimulate public outreach activities/knowledge utilisation/innovation? Suggestions for improvement?

2.9 Publication

a. Analysis of bibliometric data

Comment upon your research output based on bibliometric data with regard to productivity, citations, and publication channels. Noticeable changes over time? Potential for improvement?

b. Publication strategy

Describe your current publication strategy. If you do not have a publication strategy, please explain why. Does Publication forum rating (JuFo) have a role in your strategy? National vs. international publishing. How do you encourage and/or support publishing in open publication series? How do you follow up on the development of your publication patterns? Suggestions for improvement?

2.10 Evaluation

How are you currently conducting follow up/evaluating the research environment and research outcomes? Are individual researchers given formal or informal feedback on their performance? Suggestions for improvement?

2.11 Research-teaching linkages

How are you currently working to create links between research and teaching in order to improve student learning and research quality? Suggestions for improvement?

3. Other information

Please state below if there are matters of relevance to research quality and renewal that have not been covered above, i.e. topics at the evaluation unit that are important aspects of the preconditions and processes for high quality research that are central to your unit.

4. Organisation of work with completing the self-evaluation

Please, describe briefly how you have organised the work with completing the self-evaluation. Provide the names of the persons involved and their role in the self-evaluation.

Appendix 2. Background material

Both the evaluation units and the international research evaluation panel received the data listed below. The evaluation units were also provided with additional, more extensive bibliometric analyses, which have not been detailed here.

Personnel

- The number of personnel
- Full Time Equivalent (FTE)
- The number of personal grant recipients
- The number of undergraduate (pursuing Bachelor or Master's degree) students
- The undergraduate (pursuing Bachelor or Master's degree) student/staff ratio
- Statistics separately for each of the four research career stages
    - FTE
    - International (%)
    - Full-time (%)
    - Permanent (%)
    - Men (%)
    - Women (%)
    - Age (Median)
    - Doctoral degree from JYU (FTE)
    - Doctoral degree from other Finnish university (FTE)
    - Doctoral degree from abroad (FTE)

Financial data

- Budget (i.e., core) funding (€)
- Supplementary funding in total (€)
    - Percentage of total funding (%)
    - Finnish funding (€)
        - Academy of Finland
        - Tekes
        - Ministry of Education and Culture
        - Other public funding
        - Finnish foundations & trusts
        - Finnish companies
    - Foreign funding (€)
        - EU Structural Funds
        - ERC and EU Framework
        - Other international funding
    - Other supplementary funding (€)

- Expenditures in total (€)
    - Staff expense
    - Rents
    - External services
    - Materials & supplies
    - Travel
    - Grants
    - Depreciation
    - Other expense
    - Facilities

Doctoral degrees awarded

- Annual number of doctoral degrees awarded
    - International students (%)

National and international research visits

From the unit (the number of visits)

- Duration
    - 5 days or less
    - Over 5 days
- Type of the visit
    - Research
    - Teaching
    - Conference
    - Other
- Destination
    - Finland
    - Other
- The University of Jyväskylä (the average number of visits)

To the unit (the number of visits)

- Duration
    - 5 days or less
    - Over 5 days
- Type of the visit
    - Research
    - Teaching
    - Conference
    - Other
- The number of international visitors

Bibliometric analysis

The bibliometric analyses were based on TUTKA Research Portal, Vipunen Reporting Portal, and the Web of Science (WoS) database. The contents of the bibliometric analysis set varied by evaluation unit. If the threshold of 50 publications was not reached, the WoS based bibliometric analyses were not reported to the international evaluation panel. Furthermore, the bibliometric analyses were customised according to the wishes presented by the evaluation units.

The coverage of WoS database (%)
Publication output

- Annual number of publications by publication type
- Number of the open access publications
- Number and proportions of publications by Publication Forum (JUFO) levels
- Number and proportions of nationally and internationally co-authored publications
- Proportions of single- and co-authored publications

Overview of the scientific impact

- Total number of publications by publication type
- h-index
- Average citation count per item
- Sum of times cited with and without self-citations

Distribution of the publications by WoS categories and research areas

- The WoS categories in which the evaluation units published most frequently in 2010–2017 (Counts, %)
- The research areas of publications in 2010–2017, ranked by the times cited (times cited, % docs cited, CNCI, Counts)

Journals in which the research has been published

- Journals in which the evaluation units' researchers have published most frequently in 2010–2017, top 25 ranked by number of publications (counts, %)
- Journals in which the evaluation units' researchers have published in 2010–2017, top 10 ranked by the times cited (times cited, % docs cited, counts)
- Highly cited papers and hot papers by journal in 2010–2017, ranked by the number of publications

Collaboration

- Top collaborating institutions of the evaluation units' researchers in 2010–2017, ranked by the number of co-authored publications (counts, %)

Comparisons to other Finnish universities and the global baseline

- Times cited
- % docs cited
- Category Normalised Citation Impact (CNCI)
- Total number of publications

Ranking positions in CWRS Leiden ranking, compared to other Finnish universities

- Number of publications
- Number of top 1% publications
- Proportion of top 10% publications

Infrastructure

Available at www.jyu.fi/fi/tutkimus/infrat

Survey "Teaching, research and career at the University of Jyväskylä"

Results of the survey conducted in December 2017 and January 2018 were provided only on those topics which were deemed to be relevant to the research evaluation. The results were reported by faculty/independent institute.

Survey section II: Use of working time, work and career

13. How do you find the following statements about your work? (I fully disagree, I somewhat disagree, In between, I somewhat agree, I fully agree, Irrelevant to my work)

a. I have sufficient time to conduct research.
b. Teaching duties disturb my research work or postgraduate studies.
c. My working relationship with the University is stable and secure.
d. My work as a researcher is appreciated in my university.
e. The recruitment processes of the University of Jyväskylä are transparent and fair.
f. The University of Jyväskylä is an appealing expert organisation.
g. Good performance in research enhances the career development at the University of Jyväskylä.
h. I know well enough the laws, decrees, and university regulations effecting my work.
i. I know well enough the mechanisms controlling the activities and financial situation of the university.
j. I know well enough the personnel policies of the University of Jyväskylä (4 stage career model, tenure track).
k. The criteria of the tenure track model are transparent.
l. The strategy of the University of Jyväskylä has been put into practice in my unit.

14. How do you find the following statements about your work? (1 = I fully disagree, 2 = I somewhat disagree, 3 = In-between, 4 = I somewhat agree, 5 = I fully agree, 6 = Irrelevant to my work)

a. Owing to the weak career opportunities and/or uncertainty of my job, I have to consider other alternatives.

15. What is the scope of networking and societal interaction in your work (Co-operation related to research and teaching)? (Not at all, Rarely, Occasionally, Often, Continuously)

a. I co-operate with colleagues in my unit.
b. I co-operate with colleagues in the other units of the University of Jyväskylä.
c. I co-operate with colleagues in other Finnish universities.
d. I co-operate with colleagues in foreign universities.
e. I co-operate with colleagues in other research institutions.
f. I co-operate with the business world.
g. I co-operate with the public sector.
h. I co-operate with NGOs.
i. I participate in discussions about my field in traditional media (e.g. newspapers, radio, television)
j. I participate in discussions about my field in social media (e.g. blogs, Facebook)

16. What is the scope of internationalisation in your work? (Yes, No)

a. I teach or supervise students from different countries.
b. I have colleagues from different countries in my unit.
c. I participate in at least one international conference per year.
d. I have made a research visit abroad.
e. I have taught abroad (While being affiliated to the University of Jyväskylä).
f. I publish articles with colleagues who work in foreign universities.

17. How do you find the following claims? All University employees have equal opportunities to proceed in their careers regardless of their… (I fully disagree, I some-what disagree, In-between, I some-what agree, I fully agree, I don't know)

a. gender
b. native language
c. ethnic background
d. disabilities
e. health challenges
f. sexual orientation

Survey section V: Prerequisites of research and accumulation of research skills

38. What do you think about the following claims when assessing accumulation of research skills? (I fully disagree, I somewhat disagree, In between, I somewhat agree, I fully agree, N/A)

a. I have had opportunities to participate in method(ological) training.
b. I have had time to read method(ological) literature.
c. I have had opportunities to familiarise myself with research ethics.
d. I have had opportunities for societal interaction. (e.g. popularisation of science, media activity)
e. I have had opportunities to familiarise myself with research funding options, relevant to my current career stage.

f. I have an opportunity to get professional support in the arrangement of research projects.
g. I have an opportunity to get professional support in scientific communication.
h. I have participated in research groups with colleagues in different steps of career ladder.
i. I have participated in international research groups.
j. I have had opportunities to keep up with the state-of-art discussion of my field.
k. I have had opportunities to develop new scientific approaches on my field.
l. I have had opportunities to familiarise myself with the systems used to rate research. (e.g. citation indexes, JUFO Publication forum)
m. The university offers adequate information about the principles and requirements of open science.
n. The library has a good supply of electronic materials for my research.
o. The university offers adequate support for the management of research data and materials.

Survey section VI: Practices at departmental/unit level

39. What do you think about the following claims when assessing research practices at your unit (e.g. department)? (I fully disagree, I somewhat disagree, In-between, I somewhat agree, I fully agree, Not applicable to my unit)

a. The researchers of my unit are encouraged to mutual cooperation.
b. My unit supports the researchers who are seeking specially funded research periods.
c. My unit has organised events in which researchers can discuss together issues related to their projects.
d. My unit encourages initiatives which support the renewal of research.
e. My unit directs research activities towards focus areas.
f. My unit participates in the research networks of our own discipline.
g. My unit participates in multidisciplinary research networks.
h. My unit encourages to apply international research funding.
i. My unit directs to publish in esteemed international journals and series.
j. My unit supports the principles and requirements of open science.

Survey section VII: Support services for teachers and researchers

46. How happy are you with the adequacy of the following support services for researchers? (Very unhappy, Unhappy, In-between, Happy, Very happy, I have not used)

a. Information search services
b. Support for parallel publication
c. Information about possible research funding opportunities
d. Support related to the agreement (contractual) matters of research projects
e. Support related to innovations and commercialisation
f. Translation and proofing services

g. Putting publication information into the research information system of the University (Tutka, Converis)
h. Support when working abroad
i. Support for international researchers arriving to the University
j. Finding the right service provider from the University organisation

47. Knowledge of European statutes (Yes, No)
    a. Did you know there is a European Charter for Researchers and a Code of Conduct in the Recruitment of Researchers?
    b. Did you know that the University of Jyväskylä has an action plan that has received the status of HR Excellence in Research, based on the European Charter for Researchers and the Code of Conduct in the Recruitment of Researchers?

Academy of Finland's 2016 review of the state of scientific research in Finland

Available at
www.aka.fi/en/research-and-science-policy/state-of-scientific-research-in-finland/

Appendix 3. Programme outline for the site visit

Sunday 9.9.	
19:00–	Dinner, hosted by Director of Strategic Planning and Development Kari Pitkänen & Head of Research Development Timo Taskinen
Monday 10.9. General presentations of JYU and the Faculties	
08:30–08:45	Panel meeting
09:00–10:15	Presentations by Rector & Faculties
10:15–10:45	Coffee break
10:45–11:45	Presentations by Faculties
11:45–13:00	Lunch
13:00–14:00	Meeting with Vice Rector Henrik Kunttu
14:00–15:00	Visit to University Museum & Seminarium Building
15:00–17:00	Panel meeting
18:30–	Dinner, hosted by Rector Keijo Hämäläinen & Vice Rector Henrik Kunttu
Tuesday 11.9. Site visits to the units	
08:45–09:30	Dept of Social Sciences and Philosophy
09:45–10:30	Dept of History and Ethnology
10:30–11:00	Coffee break
11:00–12:00	Dept of Music, Art and Culture Studies
12:00–13:00	Lunch
13:00–13:45	Three parallel interview sessions with doctoral students & junior researchers
13:45–14:45	Three parallel interview sessions with department and faculty leadership, and senior researchers
14:45–15:15	Coffee break
15:15–18:30	Panel meeting
19:00–	Dinner, hosted by Dean Minna-Riitta Luukka and Vice Dean Jari Ojala (Faculty of Humanities and Social Sciences) & Director Tanja Risikko and Professor Aila-Leena Matthies (Kokkola University Consortium Chydenius)
Wednesday 12.9. Site visits to the units	
Sub-panel 1	
09:00–10:30	Faculty of Sport and Health Sciences
10:30–11:00	Coffee break
11:00–12:00	Interview session with doctoral students & junior researchers
12:00–13:30	Lunch
13:30–14:00	Visiting physical education research facilities
14:00–15:00	Interview with faculty leadership and senior researchers
Sub-panel 2	
09:00–09:20	Dept of Education
09:20–09:40	Dept of Teacher Education
09:40–10:00	Finnish Institute for Educational Research
10:00–10:20	Coffee break
10:20–10:40	Dept of Psychology
10:50–11:45	Visit to the Department of Psychology and its laboratories in Kärki Building
11:45–13:00	Lunch
13:15–14:00	Interview session with doctoral students & junior researchers
14:00–14:30	Coffee break
14:30–15:30	Interview session with department and faculty leadership, senior researchers

Wednesday 12.9. Site visits to the units

Sub-panel 3

09:30–10:30	Dept of Language and Communication Studies & Centre for Language Studies
10:30–11:00	Coffee break
11:00–11:45	Interview session with doctoral students & junior researchers
11:45–13:00	Lunch
13:00–14:30	Interview session with department and faculty leadership, senior researchers
14:30–15:00	Coffee break

All panel members

15:40–18:30	Panel meeting
19:00–	Dinner, hosted by Dean Anna-Maija Poikkeus and Vice Dean Paavo Leppänen (Faculty of Education and Psychology) & Dean Ari Heinonen and Vice Dean Sarianna Sipilä (Faculty of Sport and Health Sciences)

Thursday 13.9. Site visits to the units

09:00–09:15	Dept of Chemistry
09:15–09:30	Dept of Physics
09:30–09:45	Dept of Biological and Environmental Science
09:50–10:35	Visit to Nanoscience Center & Dept of Biological and Environmental Science
10:35–11:00	Coffee break
11:00–11:30	Visit to Dept of Physics
11:30–12:00	Visit to Dept of Chemistry
12:00–13:00	Lunch
13:00–13:45	Two parallel interview sessions with doctoral students & junior researchers
13:45–14:45	Two parallel interview sessions with department and faculty leadership, senior researchers
14:45–15:15	Coffee break
15:15–18:00	Panel meeting
19:00–	Dinner, hosted by Vice Rector Henrik Kunttu & Dean Mikko Mönkkönen, Vice Dean Ari Jokinen and Vice Dean Maija Nissinen (Faculty of Mathematics and Science)

Friday 14.9. Site visits to the units

09:00–09:30	Faculty of Information Technology
09:30–10:00	Jyväskylä University School of Business and Economics
10:00–10:30	Coffee break
10:30–11:00	Dept of Mathematics and Statistics
11:00–11:45	Three parallel interview sessions with doctoral students & junior researchers
11:45–12:45	Lunch
12:45–13:45	Three parallel interview sessions with department and faculty leadership, senior researchers
13:45–16:30	Panel meeting
16:30–17:30	Closing session: Panel members & Research Evaluation Team
17:30–18:40	Meeting with Vice Rector Henrik Kunttu
19:00–	Dinner, hosted by Dean Pasi Tyrväinen (Faculty of Information Technology) and Dean Hanna-Leena Pesonen (Jyväskylä University School of Business and Economics)

Appendix 4. Participants in the interviews

Department of Social Sciences and Philosophy
Panel members: Sue Scott, Marcel van Aken, Colin Boreham

Doctoral Students & junior researchers:
Taru Haapala, Postdoctoral Researcher
Onni Hirvonen, Postdoctoral Researcher
Joel Kaitila, Doctoral Student
Annukka Lahti, Doctoral Student
Aleksi Lohtaja, Doctoral Student
Armi Mustosmäki, Postdoctoral Researcher
Maija Mänttäri-van der Kuip, Postdoctoral Researcher
Päivi Pirkkalainen, Postdoctoral Researcher

Department and faculty leadership & Senior Researchers:
Mika Ojakangas, Professor, Head of Department
Tiina Silvasti, Professor, Vice Head (Research)
Miikka Pyykkönen, Professor, Vice Head (Education)
Karina Horsti, Academy Research Fellow
Jari Kaukua, Professor
Tiina Kontinen, Academy Research Fellow
Marjo Kuronen, Professor
Kia Lindroos, Senior Lecturer
Tapio Litmanen, Professor
Sergei Prozorov, Professor
Joona Taipale, Senior Lecturer
Sakari Taipale, Academy Research Fellow
Terhi-Anna Wilska, Professor
Mikko Yrjönsuuri, Professor

Department of History and Ethnology & Department of Music, Art and Culture Studies
Panel members: Anne Pauwels, Herman de Jong, Felicity A. Huntingford

Doctoral Students & junior researchers:
Olivier Brabant, Doctoral Student, Department of Music, Art and Culture Studies
Birgitta Burger, Postdoctoral Researcher, Department of Music, Art and Culture Studies
Pirita Frigren, Postdoctoral Researcher, Department of History and Ethnology
Eerika Koskinen-Koivisto, Postdoctoral Researcher, Department of History and Ethnology
Henna-Riikka Peltola, University Teacher, Department of Music, Art and Culture Studies
Silja Pitkänen, Doctoral Student, Department of History and Ethnology

Lauri Ockenström, Postdoctoral Researcher, Department of Music, Art and Culture Studies
Matti Roitto, Postdoctoral Researcher, Department of History and Ethnology
Juho Saksholm, Doctoral Student, Department of History and Ethnology
Tuija Saresma, Senior Researcher, Department of Music, Art and Culture Studies
Johanna Turunen, Doctoral Student, Department of Music, Art and Culture Studies
Miikka Voutilainen, Postdoctoral Researcher, Department of History and Ethnology

Department and faculty leadership & Senior Researchers:
Heli Valtonen, Senior Researcher, Head of Department, Department of History and Ethnology
Piia Einonen, Senior Researcher, Vice Head (education), Department of History and Ethnology
Heikki Hanka, Professor, Head of Department, Department of Music, Art and Culture Studies
Suvi Saarikallio, Senior Researcher, Vice Head (Research), Department of Music, Art and Culture Studies
Pertti Ahonen, Professor, Vice Head (Research), Department of History and Ethnology
Jaakko Erkkilä, Professor, Department of Music, Art and Culture Studies
Outi Fingerroos, Professor, Department of History and Ethnology
Antero Holmila, Associate Professor, Department of History and Ethnology
Petri Karonen, Professor, Department of History and Ethnology
Mikko Keskinen, Professor, Department of Music, Art and Culture Studies
Raine Koskimaa, Professor, Department of Music, Art and Culture Studies
Juha-Antti Lamberg, Professor, Department of History and Ethnology
Tuuli Lähdesmäki, Academy Research Fellow, Department of Music, Art and Culture Studies
Laura Stark, Professor, Department of History and Ethnology
Petri Toiviainen, Academy Professor, Department of Music, Art and Culture Studies

Department of Language and Communication Studies (LaCos) & Centre for Applied Language Studies (CALS)
Panel members: Anne Pauwels, Matthew K. O. Lee

Doctoral Students & junior researchers:
Johanna Ennser-Kananen, Postdoctoral Researcher, LaCos
Päivi Iikkanen, Doctoral Student, LaCos
Saara Jäntti, Postdoctoral Researcher, LaCos
Kaisa Laitinen, Doctoral Student, LaCos
Dmitri Leontjev, Postdoctoral Researcher, LaCos
Jari Parkkinen, Doctoral Student, LaCos
Anna Puupponen, Doctoral Student, LaCos
Kara Ronai, Doctoral Student, CALS
Tiina Räisänen, Postdoctoral Researcher, LaCos
Nina Sivunen, Doctoral Student, CALS

Department and faculty leadership & Senior Researchers:
Mika Lähteenmäki, Professor, Head of Department, LaCos
Arja Piirainen-Marsh, Professor, Vice Head (Research), LaCos
Taina Saarinen, Senior Researcher, Head of Department, CALS
Sari Pöyhönen, Professor, Vice Head (Research), CALS
Sigurd D'hondt, Associate Professor, LaCos
Tommi Jantunen, Senior Researcher, LaCos
Sirpa Leppänen, Professor, LaCos
Åsa Palviainen, Professor, LaCos
Ulla Richardson, Professor, CALS
Anu Sivunen, Professor, LaCos
Sari Sulkunen, Senior Lecturer, LaCos

Faculty of Sport and Health Sciences
Panel members: Colin Boreham, Marja-Liisa Riekkola, Sue Scott

Doctoral Students & junior researchers:
Eero Haapala, Postdoctoral Researcher
Jaakko Hentilä, Doctoral Student
Anna Kavoura, Postdoctoral Researcher
Anna Lee, Doctoral Student
Donna Niemistö, Doctoral Student
Heikki Peltonen, Postdoctoral Researcher
Sini Siltanen, Doctoral Student
Anu Tourunen, Postdoctoral Researcher

Senior Researchers:
Janne Avela, Professor
Taija Finni, Professor
Arja Häkkinen, Professor
Katja Kokko, Research Director
Sami Kokko, Senior Researcher
Taina Rantanen, Professor
Mikko Simula, Senior Lecturer

Faculty leadership:
Ari Heinonen, Professor, Dean
Mirja Hirvensalo, Professor, Vice Dean (Education)
Sarianna Sipilä, Professor, Vice Dean (Research)

Faculty of Education and Psychology & Finnish Institute for Educational Research
Panel members: Marcel van Aken, Felicity A. Huntingford, Herman de Jong

Doctoral Students & junior researchers:
Outi Ala-Kärppä, Doctoral Student, Department of Education
Janne Fagerlund, Doctoral Student, Department of Teacher Education
Jouni Helin, Project Researcher, Finnish Institute for Educational Research
Antti Lehtinen, Postdoctoral Researcher, Department of Teacher Education

Otto Loberg, Doctoral Student, Department of Psychology
Riitta-Leena Metsäpelto, Senior Researcher, Department of Teacher Education
Pilvi Peura, Doctoral Student, Department of Education
Jenni Salminen, Postdoctoral Researcher, Department of Education
Taru Siekkinen, Project Researcher, Finnish Institute for Educational Research
Heli Siltala, Doctoral Student, Department of Psychology

Department leadership & Senior Researchers:
Maarit Alasuutari, Professor, Department of Education
Piia Astikainen, Senior Researcher, Department of Psychology
Kaija Collin, Senior Researcher, Department of Education
Sirpa Eskelä-Haapanen, Senior Lecturer, Head of Department, Department of Teacher Education
Leena Halttunen, University Teacher, Head of Department, Department of Education
Juha Holma, Professor, Head of Department, Department of Psychology
Päivi Häkkinen, Professor, Vice Director (Research development), Finnish Institute for Educational Research
Virpi-Liisa Kykyri, Senior Researcher, Department of Psychology
Marja-Kristiina Lerkkanen, Professor, Vice Head (Research), Department of Teacher Education
Kari Nissinen, Senior Researcher, Finnish Institute for Educational Research
Mikko Vesisenaho, Senior Researcher, Department of Teacher Education
Jussi Välimaa, Professor, Director, Finnish Institute for Educational Research

Faculty leadership:
Anna-Maija Poikkeus, Professor, Dean, Faculty of Education and Psychology
Raimo Lappalainen, Professor, Vice Dean (Education), Faculty of Education and Psychology
Paavo Leppänen, Professor, Vice Dean (Research), Faculty of Education and Psychology

Faculty of Information Technology
Panel members: Matthew K. O. Lee, Marcel van Aken, Anne Pauwels

Doctoral Students & junior researchers:
Andrei Costin, Postdoctoral Researcher
Hadi Ghanbari, Postdoctoral Researcher
Sampsa Kiiskinen, Doctoral Student
Rebekah Rousi, Postdoctoral Researcher
Ari Tuhkala, Doctoral Student
Naomi Woods, Postdoctoral Researcher

Senior Researchers:
Pekka Abrahamsson, Professor
Tommi Kärkkäinen, Professor
Kaisa Miettinen, Professor
Pekka Neittaanmäki, Professor

Arto Ojala, Senior Lecturer
Tuomo Rossi, Professor

Faculty leadership:
Pasi Tyrväinen, Professor, Dean

Jyväskylä University School of Business and Economics
Panel members: Herman de Jong, Colin Boreham, Sue Scott

Doctoral Students & junior researchers:
Stefan Baumeister, Postdoctoral Researcher, Corporate Environmental Management
Heikki Lehkonen, University Teacher, Economics
Antti Rautiainen, Associate Professor, Accounting
Elina Riivari, University Teacher, Management and Leadership
Hanna Reinikainen, Doctoral Student, Corporate Communication
Kimmo Taiminen, Doctoral Student, Marketing

Senior Researchers:
Juha-Antti Lamberg, Professor, Strategy and Entrepreneurship
Kalle Pajunen, Professor, Strategy and Entrepreneurship
Kirsi Murtosaari, Head of Faculty Administration
Outi Uusitalo, Professor, Marketing
Roope Uusitalo, Professor, Economics

Faculty leadership:
Hanna-Leena Pesonen, Professor, Dean, Corporate Environmental Management
Vilma Luoma-aho, Professor, Vice Dean (Research), Corporate Communication

Department of Mathematics and Statistics
Panel members: Marja-Liisa Riekkola, Felicity A. Huntingford

Doctoral Students & junior researchers:
Amal Attouchi, Postdoctoral Researcher
Thibaut Dumont, Postdoctoral Researcher
Augusto Gerolin, Postdoctoral Researcher
Anna Kausamo, Doctoral Student
Antti Luoto, Doctoral Student
Matthew Romney, Postdoctoral Researcher
Tran Thuan Nguyen, Doctoral Student
Santtu Henrik Tikka, Doctoral Student

Department leadership & Senior Researchers:
Tero Kilpeläinen, Professor, Head of Department
Petri Juutinen, Professor, Vice Head (Education)
Juha Karvanen, Professor
Pekka Koskela, Professor
Mikko Parviainen, Senior Lecturer
Kai Rajala, Professor
Tapio Rajala, Academy Research Fellow
Mikko Salo, Professor

Sara Taskinen, Senior Lecturer
Matti Vihola, Academy Research Fellow/Associate Professor

Faculty leadership:
Mikko Mönkkönen, Professor, Dean, Faculty of Mathematics and Science
Ari Jokinen, Professor, Vice Dean (Research), Department of Physics

Department of Physics & Department of Chemistry
Panel members: Marja-Liisa Riekkola, Herman de Jong, Matthew K. O. Lee, Anne Pauwels

Doctoral Students & junior researchers:
Laetitia Canete, Doctoral Student, Department of Physics
Minttu Kauppinen, Doctoral Student, Department of Chemistry
Marko Melander, Postdoctoral Researcher, Department of Chemistry
Heikki Mäntysaari, Postdoctoral Researcher, Department of Physics
Risto Ojajärvi, Doctoral Student, Department of Physics
Siiri Perämäki, Postdoctoral Researcher, Department of Chemistry
Rakesh Puttreddy, Postdoctoral Researcher, Department of Chemistry
Panu Ruotsalainen, Postdoctoral Researcher, Department of Physics
Ville Saarnio, Doctoral Student, Department of Chemistry
Elli Selenius, Doctoral Student, Department of Physics

Department leadership & Senior Researchers:
Markku Kataja, Professor, Head of Department, Department of Physics
Tanja Lahtinen, Senior Lecturer, Vice Head (Education), Department of Chemistry
Timo Sajavaara, Professor, Vice Head (Research), Department of Physics
Gerrit Groenhof, Professor, Department of Chemistry
Matti Haukka, Professor, Department of Chemistry
Hannu Häkkinen, Academy Professor, Department of Physics & Department of Chemistry
Tuomas Lappi, Professor, Department of Physics
Petri Pihko, Professor, Department of Chemistry
Perttu Permi, Professor, Department of Chemistry
Jussi Toppari, Associate Professor, Department of Physics

Faculty leadership:
Mikko Mönkkönen, Professor, Dean, Faculty of Mathematics and Science
Ari Jokinen, Professor, Vice Dean (Research), Department of Physics

Department of Biological and Environmental Science
Panel members: Felicity A. Huntingford, Marcel van Aken, Colin Boreham, Sue Scott

Doctoral Students & junior researchers:
Emily Burdfield-Steel, Postdoctoral Researcher
Merja Elo, Postdoctoral Researcher
Andreas Eriksson, Doctoral Student
Marko Haapakoski, Postdoctoral Researcher
Kati Kivisaari, Doctoral Student

Mira Laajala, Doctoral Student
Silva Uusi-Heikkilä, Senior Researcher

Department leadership & Senior Researchers:
Janne Ihalainen, Professor, Head of Department
Leena Lindström, Professor, Vice Head (Research)
Emily Knott, Professor, Vice Head (Education)
Jussi Kukkonen, Professor
Anna Kuparinen, Academy Research Fellow
Johanna Mappes, Professor
Hannu Ylönen, Professor, Director of the Konnevesi Research Station

Faculty leadership:
Mikko Mönkkönen, Professor, Dean, Faculty of Mathematics and Science
Ari Jokinen, Professor, Vice Dean (Research), Department of Physics

Kokkola University Consortium Chydenius
Panel members: Matthew K. O. Lee, Marja-Liisa Riekkola

Doctoral Students & junior researchers:
Sirkku Lähdesmäki, Doctoral Student
Mikko Myllymäki, Doctoral Student
Ingo Stamm, Doctoral Student

Leadership and Senior Researchers:
Tanja Risikko, Director
Ismo Hakala, Professor
Aila-Leena Matthies, Professor
Päivi Perkkilä, Senior Lecturer

JYU Graduate School for Doctoral Studies
Panel members: Marcel van Aken, Colin Boreham, Felicity A. Huntingford, Herman de Jong, Matthew K. O. Lee, Anne Pauwels, Marja-Liisa Riekkola, Sue Scott

Tuula Oksanen, Graduate School Coordinator

Appendix 5. Research evaluation organisation

Science Council acted as the steering group:
Vice Rector Henrik Kunttu (chair)
Vice Dean Jari Ojala
Vice Dean Mikko Siponen
Vice Dean Vilma Luoma-aho
Vice Dean Paavo Leppänen
Vice Dean Sarianna Sipilä
Vice Dean Ari Jokinen
Director Tanja Risikko
Vice Head of Institute Päivi Häkkinen
Director of strategic planning and development Kari Pitkänen
Graduate school coordinator Tuula Oksanen
Head of research development Timo Taskinen

Research evaluation team:
Director of strategic planning and development Kari Pitkänen
Head of research development Timo Taskinen
Senior planning officer Anne Lyytinen

Bibliometric analyses:
Information specialist Marja Kokko (JYU Open Science Centre)