



# **Tampere University's Research Assessment Exercise 2022**

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Tampere University  
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## FOREWORD

Tampere University, the second largest university in Finland, was launched in January 2019 by the merger of Tampere University of Technology and the University of Tampere. The new university set its sights high in both education and research, development and innovation. The university endeavours to be an influential societal actor locally, nationally and globally.

The university has an ambitious strategy called “Together for a sustainable world” which emphasises its role and responsibility in solving global problems. Fulfilling this mission requires cutting-edge research the results of which are utilised in the form of innovations in a broad and deep interaction with society. Tampere University strives for both scientific and societal impact.

The multidisciplinary nature of the new university supports succeeding in this task. Our strong fields of technology, health and society form a unique combination in Finland that enables co-operation and interaction both across fields of science and faculties and across organisational boundaries. Multidisciplinary research and education have already taken great strides forward in the first years of the new university.

A research university is primarily an international institution. International co-operation in the world of science is essential for meeting global challenges. In addition, foreign businesses and organisations have a notable role in the internationalisation of Tampere University’s research.

During its first years, Tampere University has already proven its worth as well as an ability to develop. In open science, for example, it is the only Finnish university that has achieved the highest national level in the latest national follow-ups. The university has also made bold moves, such as the faculty structure that promotes multidisciplinary, the tenure track system, and Tampere Institute for Advanced Study that employs top researchers.

Tampere University wants to become even better and to further the goals set out in its strategy. To this end, an external research assessment that covers all fields of science is an extremely important tool. Thus, the university decided to carry out a research assessment (TAU RAE 2022) already at this point to gain both valuable information and outsiders’ views on how the university should be developed.

TAU RAE 2022 was implemented in two phases. In the first phase in June 2022, international assessment panels evaluated the scientific quality and impact as well as the societal impact of research. In the second phase in October 2022, the chairs of the assessment panels conducted round table discussions with the university’s leadership on how the university could be developed as an environment for influential cutting-edge research. There is no second phase in the basic RAE assessment, but it proved to be very useful.

Naturally, an assessment that was conducted so early in the life of the new university is not able to highlight what effect the university's actions have had on the quality and impact of research. Thus, TAU RAE 2022 is a kind of point zero to which subsequent assessment results will be compared. On the other hand, the results from the second phase, the recommendations of the panel chairs for developing the university as a research environment, can already be fully used.

TAU RAE 2022 produced invaluable information which the university will use in various ways to develop operations. People who participated in the assessment have consistently reported how useful the assessment process and especially the drafting of self-assessments were.

TAU RAE 2022 was a huge undertaking at the university and by the external assessors. I want to extend my heartfelt thanks not only to the panel members but also to the faculties and units, and to the highly skilled organisers of the assessment project.

30 November 2022

**Mari Walls**

President

## INTRODUCTION

On behalf of the three panels for the research assessment exercise 2022, we would like to express our gratitude to Tampere University for allowing us to assess the scientific quality and scientific and societal impact of the research conducted at the units of assessment.

Tampere University started upon a merger in 2019. The strategy of the university, "Together for a sustainable world", emphasises multidisciplinary for a future successful development of the university. The overall organisation and governance are well suited for this ambition and despite the young age of the University, the panels are impressed by many of the achievements so far. We have not identified any reasons at the present time to make organisational changes. However, it will be important to further develop leadership instruments for head of units to ensure building stronger research environments.

Another concern is that the University strategy needs to be integrated at all levels to ensure engagement and ownership. This is important to ensure support for further actions. Tampere University is facing many challenges and it will be crucial to make necessary priorities aligned with the overall strategy. The University leadership together with the faculties should define necessary action plans allowing for the different preconditions at the faculties. We strongly recommend building on the current strengths and newly emerging areas where Tampere University could make a real difference.

Below is our overall summary where we are focussing on selected issues that we believe need further attention. The summary is based on the Assessment reports (17 June 2022) as well as discussions between the panel chairs and Tampere University leadership (27–28 October 2022).

### **Strive for excellence in research**

It is recommended that Tampere University focuses on excellence in research with regard to building strong research environments, state-of-the-art research infrastructure, and open and international recruitments such as tenure track positions. It will also be important to further develop an international publication strategy to promote high quality and a change in publication culture.

To strengthen excellence in research, Tampere University needs to further develop a diversity and gender balance strategy to be implemented at all university levels. Further development of mentoring programs at all levels will be an important aspect in reaching excellence.

## **Support to early career researchers**

The Tampere University leadership together with the faculties need to further develop tenure track positions to attract talented young scientists and broaden the international perspectives. At the same time there is also a need to consider more transparent and alternative career paths for young researchers.

We recommend an evaluation of the current structure of the doctoral school and programs to ensure that it fulfils the needs of the PhD students in their future career development. Tampere University should consider reducing the number of programs to better align with its strategy. This should be done together with the PhD students. Faculties should consider a more sustainable long-term funding model for PhD students with a special focus on open PhD positions better aligned with the university strategy.

## **Infrastructure**

Tampere University should develop and implement an umbrella organization for infrastructure and core facilities to enforce awareness and optimal use at all levels. The ongoing exercise with the infrastructure roadmap will be a key to define how open and transparent prioritisation for investments should be done and how to secure high-level competence and technology development. The governance structure with an infrastructure director needs to be clarified.

At the overall University level, it will be necessary to secure core funding for investments in the shared research infrastructure at the TAU Research Hub. To avoid overlap and unnecessary investments, it will be important to increase the use of national and international infrastructures among Tampere University researchers as well as promoting the visibility of Tampere University infrastructure within the national and international research community.

## **Internationalisation**

We recommend that Tampere University develops an Internationalisation strategy with special focus on the following aspects: increase mobility for all staff with strategically important partners, define the hindrance for a successful sabbatical system, promote international recruitments especially for tenure track positions, promote and making visible the strengths of Tampere University research and education, and to develop the international and intercultural experience and understanding of all students and staff by implementing “Internationalisation at home”.

Another important aspect is how Tampere University can increase its success within the EU funding system.

28 October 2022

**Mari-Ann Einarsrud**

Norwegian University of Science and Technology, Norway  
Chair of the Panel for Technology

**Jan-Ingvar Jönsson**

Lindköping University, Sweden  
Chair of the Panel for Health

**Reine Meylaerts**

KU Leuven, Belgium  
Chair of the Panel for Society



# TAU RAE 2022 PROCESS

## Background and starting points

Undergoing external research assessments is one of Tampere University's (TAU) strategic actions supporting the improvement of the scientific quality of research.

TAU RAE 2022 was the first comprehensive external and international research assessment conducted at Tampere University. The University started its operations in January 2019, resulting from the merger of University of Tampere (UTA) and Tampere University of Technology (TUT). In the former institutions research assessments were conducted in 2004 and 2014 at UTA, and in 2011 and 2017 at TUT. TAU RAE 2022 was designed and conducted following national and international guidelines on responsible research assessment<sup>1</sup>. In addition, Tampere University has its own principles for monitoring and evaluating research that were followed (*Appendix 1*). These principles take into consideration the University's strategic aims.

Key principles guiding this assessment were reflecting the diversity of different scientific fields and taking different dimensions of scientific productivity into account in the formulation of assessment criteria as well as the selection and defining of assessment methods and indicators. In accordance with these principles, diversity of assessment methodology and indicators were allowed between panels, and to some degree also within panels. In addition, units of assessment (UoA) were invited to take part in the planning of the assessment material, in order to produce material that is relevant to all units within each panel, to ensure a meaningful evaluation for all disciplines. Ensuring that the assessment material is relevant, and therefore useful to UoAs is in accordance with the principle of cost-effectiveness. It is important that the workload of the assessment is proportional to the aims and anticipated outcomes of the assessment.

One key principle guiding the design of TAU RAE 2022 was that evaluation should consider the quality of the University's research environment as a site for research work. Evaluation should reveal how the University as an institution can facilitate and promote high-quality and impactful research activity. To follow this principle, the evaluation was conducted in two stages.

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<sup>1</sup> Good practice in research evaluation. Recommendation for the responsible evaluation of a research in Finland (<https://doi.org/10.23847/isbn.9789525995268>); DORA (<https://sfdora.org/read/>); Leiden Manifesto (Hicks et al. 2015).

## Purpose and aim of assessment and utilisation of results

The purpose of TAU RAE 2022 was to assess

- the scientific quality and scientific and societal impact of the research conducted at the units of assessment
- the units of assessment as research environments
- the future potential of the units of assessment

In accordance with Tampere University's strategy and values, interdisciplinarity and multidisciplinary, open science, societal interaction and internationality were considered as important elements of scientific quality, and scientific and societal impact. Therefore, the role of these elements in the research activities were also examined.

The general aim of the assessment was to provide information that would be useful for advancing the high quality and impact of research.

The results of the assessment will be utilised in setting strategic goals and monitoring progress towards those goals, as well as supporting institutional development and decision-making.

## Organisation

The assessment process was initiated by the Rectorate on December 1, 2020, and the Science Council was involved in the preliminary planning of the assessment. To ensure the impartiality of the assessment, an external Steering Group to manage the assessment process was nominated in June 2021. To maintain communication between the assessment process and the University's strategy, Tampere University's Vice President for research attended the Steering Group meetings.

Steering Group:

Vice-Rector Paula Eerola, University of Helsinki, Chair (until March 1, 2022)

Provost Kristiina Mäkelä, Aalto University, Chair (since March 1, 2022)

Professor Risto Renkonen, University of Helsinki

Professor Anssi Paasi, University of Oulu

The Project Manager of TAU RAE 2022, Specialist Laura Himanen, acted as the secretary of the Group.

## First Stage

TAU RAE 2022 was conducted in two stages.

In the first stage of TAU RAE 2022, research conducted at Tampere University was assessed in three panels: technology, health and society. The units of the faculties acted as units of assessment (UoA). The UoAs chose which panel they wished to be assessed in.

The unit structure within the faculties is somewhat rigid and does not fully represent the organisation of research at Tampere University. The units are multidisciplinary, and research groups and centres within units could belong to different assessment panels. However, in the absence of a perfect unit of assessment, faculty units were considered optimal in the context of this assessment as they cover all of the University's research activity and support implementing conclusions made based on the assessment results as existing organisational units before and after the assessment.

The panels assessed 1) the scientific quality and scientific and societal impact of the research conducted at the UoAs, 2) the UoAs as research environments, and 3) the future potential of the UoAs. For more details on the assessment criteria, please see *Appendix 2*.

In the panel for technology there were eight units from four faculties:

### Faculty of Built Environment (BEN)

- Architecture
- Civil Engineering

### Faculty of Engineering and Natural Sciences (ENS)

- Automation Technology and Mechanical Engineering
- Materials Science and Environmental Engineering
- Physics

### Faculty of Information Technology and Communications Sciences (ITC)

- Computing Sciences
- Electrical Engineering

### Faculty of Management and Business (MAB)

- Industrial Engineering and Management

In the panel for health there were three units from two faculties:

### Faculty of Medicine and Health Technology (MET)

- BioMediTech
- Clinical Medicine

#### Faculty of Social Sciences

- Health Sciences

In the panel for society there were ten units from four faculties:

#### Faculty of Education and Culture

- Education

#### Faculty of Information Technology and Communications Sciences (ITC)

- Communication Sciences
- Language Studies

#### Faculty of Management and Business (MAB)

- Administrative Studies
- Business Studies
- Information and Knowledge Management
- Politics

#### Faculty of Social Sciences (SOC)

- History, Philosophy and Literature
- Social Research
- Welfare Sciences

## Assessment material for first stage

The assessment was based on UoAs' self-assessment reports, statistical information on the UoAs provided by the University's information services, bibliometric reports of the UoAs provided by Tampere University Library metric team, and interviews conducted by the assessment panels during the site visit week on June 13–17, 2022.

The time period for the statistical information concerning the UoAs, i.e., information on members of the UoAs, research funding and doctoral education, was 2019–2021. Most of the bibliometric information covered only the years 2019–2020, as publication data was not fully complete for the year 2021 at the time of data collection.

Due to the short time periods, the assessment panels were instructed to consider statistical and bibliometric information as background material, rather than as assessment material, and consider the self-assessment reports submitted by the UoAs as primary assessment material. The assessment materials only included the research performance of those members of the UoAs who were employed by Tampere University on the census date, October 1, 2021.

In addition to the material described above, the UoAs also compiled a list of their top outputs. The number and types of outputs from the years 2017–2020 that could be included on the list were decided by the UoAs within each panel. Consequently, there was some variation between the panels:

Panel for Technology: top 20 or 30 outputs that the UoAs found most descriptive of their excellence/impact/visibility/etc.

Panel for Health and Panel for Society: top 10 publications

## Second stage

In the second stage, the Chairs of the three assessment panels were invited back to Tampere to discuss the University as a site for conducting quality research with the members of the TAU RAE 2022 external Steering Group and Tampere University senior management. For more detailed description of the second stage please see *Appendix 3*.

The second stage was organized as a round table discussion that took place on October 27–28, 2022. Mari Walls, the President of Tampere University, acted as Chair. The discussion was based on material provided to the participants prior to the visit and on the insights the Panel Chairs gained during the first stage site visit. The material provided to the participants included information on:

- development areas based on the first stage assessment reports identified by Tampere University
- preselected strategic areas:
  1. researchers' career path
  2. research environment and strategic funding
  3. collaboration and interaction
- strategic instruments:
  1. Doctoral School
  2. Tampere Institute for Advanced Study
  3. Research platforms
  4. Research sabbatical system for full-time professors

Based on the discussions, the Panel Chairs submitted a joint introduction for the final report at hand.

## Assessment Panels

The units of assessment were invited to suggest members to the assessment panels. All suggestions were scrutinized for conflict of interest. In general, an expert was disqualified from being a potential panel member if they had been engaged in joint research projects with the researchers of units they assess or had joint publications with them, from the beginning of 2016 until present time. Other avenues for finding potential panel members were used as well, but most members were invited based on suggestions received from the UoAs.

### Panel for Technology

Mari-Ann Einarsrud, NTNU, NO, Chair  
Rachid Alami, CNRS, FR  
Gabriella Andersson, Uppsala University, SE  
Björn Birgisson, University of Georgia, US  
Paolo Favaro, University of Bern, CH  
Hans Gellersen, Lancaster University, UK  
Katharina Hölzle, University of Stuttgart, DE  
Bernhard Müller, TU Dresden, DE  
Ursula van Rienen, University of Rostock, DE

### Panel for Health

Jan-Ingvar Jönsson, Linköping University, SE, Chair  
Martin McKee, London School of Hygiene and Tropical Medicine, UK  
Konstantina Nikita, National Technical University of Athens, GR  
Katja Schenke-Layland, University of Tübingen, DE  
Elizabeth Tanner, Queen Mary University of London, UK  
Kristiina Vuori, Sanford Burnham Prebys, US

### Panel for Society

Reine Meylaerts, KU Leuven, BE, Chair  
Mats Alvesson, Lund University, SE  
Karin Helmersson Bergmark, Stockholm University, SE  
Alessandra Faggian, Gran Sasso Science Institute, IT  
Natalie Fenton, Goldsmiths College, University of London, UK  
Hans Petter Graver, Oslo University, NO  
Alfons Hamm, University of Griefswald, DE  
Gloria Kirwan, Royal College of Surgeons in Ireland, University of Medicine and Health Sciences, IE

Robert Klassen, York University, UK

Iver B. Neumann, Fridtjof Nansen Institute, Oslo, NO

Sylvie Patron, Paris Diderot University, FR

Giacco Schiesser, University of the Arts Zurich, CH

# ASSESSMENT REPORTS

## I. PANEL FOR TECHNOLOGY

### UoA1 Materials Science and Environmental Engineering

#### Summary of the UoA

MSEE is a part of the Faculty of Engineering and Natural Sciences and comprises three sub-units: Chemistry and Advanced Materials (CAM), Bio and Circular Economy (BIC) and Engineering Materials Science (EMS). The research is covering a broad range of fields in both natural science and engineering. The three sub-units are coherent in their field of research, but the complementarity between the sub-units is rather small. The goals of the unit are well aligned with TAU's strategy "Together for a Sustainable World".

#### 1. Scientific quality

*Rating: 4*

The unit has a contribution to excellent research manifested by the following achievements: Partner in Academy of Finland Centre of Excellence, ERC Grants, MSC ITN and partner in Academy of Finland Flagship projects. To further develop the research in the whole unit in an excellent direction, an overall research strategy focussing on developing their efforts in a coherent direction is needed. In this way, the research of the unit as a whole has the potential to be internationally recognised and of excellent quality. The research in the CAM sub-unit is internationally recognised and of excellent novelty and ambitiousness in its focus on light-matter interactions. The research in the EMS sub-unit is of good quality, and the panel recommends this sub-unit develops a focused research strategy and creates teams of critical mass by using the positions that will be available. The BIC sub-unit, currently heavily involved in applied research, is recommended to continue to strengthen the fundamental science activities.



## 2. Scientific impact

*Rating: 4*

The researchers at the MSEE unit published about 200 publications in 2021, with a strong focus on refereed international journals (>160) and with an increasing number of level 2 and 3 publications, showing that the research in the unit is attracting wide interest in the academic community. The impact of the research is showing a positive and increasing trend, where, e.g., awards and graduate school contribute. A further focus on level 2 and 3 publications is recommended. The panel recommends the MSEE researchers take a stronger lead internationally, e.g., through the organization of conferences and symposia, being members of editorial boards, to increase their international scientific visibility and impact.

## 3. Societal impact

*Rating: 4*

The unit has a strong collaboration with the industry. The candidates educated are to a large extent trained in these industry-related projects contributing to the societal impact by producing new knowledge and solutions to important challenges (e.g., waste streams). The panel recommends that the outcome and impact of this collaboration should be better communicated to the society as a whole, and the impact this gives should be used in, e.g., recruitment. Especially the BIC sub-unit has great potential here and should have a stronger strategic focus on disseminating the results of its research to society. The MSEE unit is participating in solving important challenges related to sustainability, environment, and climate change, and should use this to a larger extent to take a lead in defining, e.g., regulations, decision making.

Multidisciplinary is an asset to the unit which should further be developed in collaboration with other faculties, along similar lines as the excellent example of cell culture platforms and multi-well platforms together with the MET faculty. The unit also has a strong focus on open access publications and should continue in that direction.

## 4. Unit as a research environment

*Rating: 4*

The unit is dependent on a well-equipped research infrastructure for further success. A long-term development strategy and investment plan should be made, including necessary personnel for the maintenance, and running of the laboratories. In addition to their own laboratories, the unit will need easy access to the shared university infrastructure facilities in Microscopy and Scientific computing as well as large international facilities, e.g., MAX IV and ESRF. A special

challenge is the spread of the present laboratories in several buildings, and the need for gathering the laboratories in the planned new TAU Research Hub is urgent. MSEE is also dependent on specialised infrastructures, such as the light-based technologies lab (FinnLight) which is on the Roadmap for Finnish Research Infrastructures. The research of the unit is laboratory intensive, and adequate numbers of laboratory support personnel (technicians) and staff scientists have to be secured.

The unit has young academics, as out of 19 professors only 5 have been tenured for more than 5 years. There is good complementarity among researchers in the sub-units. MSEE expects to recruit 7-8 new tenure track professors in 2022-2023. With the ambitions of the unit and the broad research fields covered, this will absolutely be an asset and create more robust teams of people (above critical mass). However, a strategic plan has to be made to secure that the future personnel is in accordance with the research strategy and that the unit is not spreading its resources over too many fields. The unit also needs to professionalise the routines for hiring, including developing a strategy for diversity, equality inclusion and gender balance. A mentoring program for new staff members should be further developed.

The funding structure within the unit is well balanced with national and international funding (external funding almost 7 mill EURO in 2021). The panel supports the strategy of the group to focus on increasing the EU funding, ERC grants, and coordinating EU projects in the future. Focus on building a stronger European network should be emphasised.

The panel found the positive “team spirit” within the unit exceptional and this excellent working environment has to be secured also for the future.

## **5. Potential of the unit**

*Rating: 4*

The goals of the unit are well aligned with the strategy of TAU “Together for a Sustainable World” and there is a large potential to further develop this and to make the unit a stronger decision-maker in the field of sustainability.

The close contact with the industry is an asset to the unit in the form of financial support, relevant topics for master theses and doctoral theses and bringing relevance to society. The large industrial funding should not limit a future stronger focus on fundamental research giving a higher scientific impact. The unit already has researchers being granted financial support from excellence funds like ERC, which should be further emphasised.

The establishment of the new TAU Research Hub building will be of utmost importance for the further success of the unit. It is critical that this building will be constructed to promote

collaboration among different units and faculties, and that enough laboratory support personnel is secured for it.

## UoA2 Electrical Engineering

### Summary of the UoA

The unit of Electrical Engineering is part of the Faculty of Information Technology and Communication Sciences (ITC). The unit focuses on three main research areas: Communications Engineering and Radio Systems, Electronics and Embedded Systems, and Electrical Energy Engineering. The research topics are driven by worldwide challenges in regard to climate change and urbanization and are linked to five out of the United Nations' 17 Sustainable Development Goals. Thus, they perfectly fit into TAU's strategy "Together for a Sustainable World".

### 1. Scientific quality

*Rating: 4*

Internationally, the unit received a high recognition exemplified by several aspects, such as an ERC Starting Grant, four IEEE Fellows and eight Academy of Finland Research Fellows expressing the excellent research quality. This is also underlined by the coordination of two Marie Skłodowska-Curie Actions (MSCA) Innovative Training Networks (ITNs). Furthermore, the Unit participates in one Academy of Finland Flagship activity, one Academy of Finland Centre of Excellence and two further national networks. Especially the early-career researchers were already very successful in achieving high-level grants.

Several researchers are highly cited and overall about 30 % of the publications are in JUFO levels 2 and 3. About 60 % of the publication have international co-authors reflecting the good international integration. The Unit should strive to further increase the number/percentage of publications in top-level journals.

### 2. Scientific impact

*Rating: 4*

Besides the highly prestigious EU funding mentioned above, the collaboration with CERN on superconducting magnets for the Future Circular Collider and the high recognition within IEEE,

manifested by one member of an IEEE Society's Board of Governors, four IEEE Fellows, and general chairmanship of two IEEE conference series, as well as editorial positions in numerous major journals underline the wide interest and high recognition of the scientific community in the Unit's research.

With a view to further advance research throughout the Unit in an excellent direction, the junior level's success in achieving outstanding grants such as ERC Starting Grants and Academy of Finland Fellowships should be supplemented wherever possible by ERC Synergy, Consolidators or Advanced Grants.

### **3. Societal impact**

*Rating: 5*

The unit contributes to grand challenges such as digitalisation, electrification and sustainability. The Unit has a close relationship with the Finnish industry including industrial partners such as Nokia, Ericsson, Intel, Huawei, GE Healthcare, and ABB. This is flanked by a number of spin-off companies. The Unit has an impact on the standardization process of wireless technology in the 3rd Generation Partnership Project (3GPP) and the European Telecommunications Standards Institute (ETSI), smart textile in the European Committee for Standardization (CEN, French: Comité Européen de Normalisation), and wearable electronics and printed electronics in the International Electrotechnical Commission (IEC). In addition, it is actively involved in contributing to regularisation and legislation on radio networks and electricity distribution networks. Furthermore, the researchers published a high number of open-access data sets (synthetic, simulated and measured data) and open-source software through portals such as Zenodo, IEEEDataPort CodeOcean, and GitHub. The Unit is broadly engaged in highly multidisciplinary research. An example is the new Climate Neutral Energy Systems and Society (CNESS) research platform at TAU. Other examples are the EL-TRAN Consortium on electric energy systems, and the ProCem and ProCemPlus projects in the Smart Energy Systems Competence Center (SENECC) that involve other disciplines such as energy politics, and economics. Thus, regarding sustainability, pioneering work is done in electrical energy engineering. Further multidisciplinary work regards among others implantable sensors for health care and energy harvesting for precision agriculture. Finally, multiple interdisciplinary research is carried out inside engineering sciences, not all to be listed here, and future potential such as advanced communication technologies for smart grids are envisaged. The Unit's research is outstanding in terms of reach and significance.

#### 4. Unit as a research environment

*Rating: 4*

In several of the research areas, the infrastructure is partly world-class level, including the participation in the Academy of Finland National Research Infrastructure Roadmap. The Unit participates in two out of the 29 research infrastructures selected by the Finnish Research Infrastructure Committee (FIRI Committee), i.e., Future Wireless Communication Networks (FUWIRI) and Printed Intelligence Infrastructure (PII). Added to this is the multifaceted Electrical Energy Engineering infrastructure, which includes a PV solar power research plant in addition to some very different research environments. These infrastructures and their constant updating, e.g., by a proof-of-concept 6G environment, is a superb basis for its research and continuing success in highly competitive international research funding.

The cooperation with several high-level international scientists in addition to the project-based national and international collaboration presents an excellent basis for the mobility, clearly underpinned in the self-assessment report, and networking of undergraduates and junior scientists. The great number of market leaders among the Unit's industrial partners contributes to an excellent research environment. The academic staff is very international with a non-Finnish share of nearly 50 %, which underlines its successful recruiting strategy. The Unit left the impression of being a coherent team.

The Unit's external funding showed an increase over the reporting period with a 25 % share of competitive funding from abroad in 2021. Worth mentioning, in particular, is the constant increase in EU funding. Overall, the main funding sources are well-balanced.

While there are already best-practise examples, e.g., successfully practised in the A-WEAR MCSA ITN with even 60 % female share but also in 1-2 other teams led by early career female researchers, the Unit as a whole should develop a strategy and plan to improve diversity. To maintain the largely outstanding quality of the research infrastructure, the Unit should seek a long-term plan in investing in infrastructure. This should optimally be included in a university-wide strategy. The faculty should work on the university providing a structure for competitive enough starting packages.

#### 5. Potential of the unit

*Rating: 4*

The Unit shows high future potential. Its future plans for research are significant and very ambitious. In Communications Engineering and Radio Systems, they aim at being at the international forefront in the future 6G technology in five different topics ranging from the mm-

wave and (sub-)THz access technology to advanced satellite systems, and radio sensor technology for defence and security. The sub-unit on Electronics and Embedded Systems has ambitious aims in five topics such as sustainable materials and energy-efficient processes or embedded and cyber-physical systems. Electrical Energy Engineering will research on five topics as well, here spanning very different scales from optimal topologies and controls for power electronics up to smart grids and the energy market. In all these research topics, the Unit continues to focus on the grand challenges of society. In addition, some envisioned topics span over all three sub-units, including the augmented human, intelligent machines and medium-frequency electromagnetics. The planned actions are feasible.

Regarding personnel, the Unit's plans of increasing the scientific staff on level 3 and free teachers' time for part-time research and thus strengthen and expand its research competencies are absolutely supported. The above-mentioned future research topics shall profit from three new tenure-track openings with respective denominations.

By a combination of different funding sources from the TAU internal investment programme, national sources, particularly FIRI programme of the Academy of Finland, and EU sources, it seems feasible to continuously keep the excellent and partly outstandingly high level of the infrastructures.

The panel recognises the strong collaboration with other units and encourages the unit to continue this.

## UoA3 Computing Sciences

### Summary of the UoA

Computing Sciences is the largest technology research unit in the University, and part of the Faculty of Information Technology and Communication Sciences. The unit was only recently formed in its current composition, with seven sub-units: Human-Technology Interaction (HTI), Software Engineering (SW), Data Science (DATA), Mathematics (MATH), Signal Processing (SGN), Computer Engineering (CE) and Security (NISEC). Most sub-units have been longer established and are cohesive internally, with exception of HTI which has been formed from three groups that are still split over locations and in background. On the whole, the Computing Sciences unit represents an impressive collection of research activity but at this stage, the unit is still more fragmented than united in research identity.

## 1. Scientific quality

*Rating: 4*

The quality of the research varies across the research areas. At the top end, there is excellent if not outstanding research as evidenced by ERC grants and participation in Academy of Finland Centers of excellence. SGN stands out as a sub-unit that impresses holistically with a strategic approach to high caliber research and evidence of world-class activity and output. There are strong indicators of excellence also in other sub-units, for example an ERC starting grant in NISEC, and participation of MATH in the CoE on Inverse Modelling and Imaging.

The unit on the whole is prolific in its research output, with over 400 publications in 2021 of which 32 at the top JUFO level. A large proportion of publications are in conference proceedings, in line with different practices in some subfields where the best conferences are more competitive than journals and regarded as premier publication venues. Selected outputs highlighted by SGN, CE, DATA and HTI for the reporting period are all published at the top of their respective areas, evidencing international excellence, while the quality of output in SW appears weak.

## 2. Scientific impact

*Rating: 4*

The scientific impact of the unit is excellent and in parts outstanding. Researchers achieve good citation rates for the work published, and some of the citation figures are outstanding, for example for work in gamification, signal processing and parts of data science. In parts of the unit, and especially in SGN, there is outstanding complementary activity to maximise visibility through for instance conference organization and leadership in international networks and agenda-setting. The panel recommends that the researchers across the unit develop a stronger focus on international leadership in their respective areas.

The panel is particularly impressed by the initiative on “advanced imaging as a service”. This is an outstanding example for maximizing impact through shared infrastructure and joint-up thinking. It is commendable that there is also extensive open-source output produced by the unit in addition to conventional publications. This is significant in contributing tools on which other researchers can build.

### 3. Societal impact

*Rating: 4*

Practically all of the research in the unit has a clear connection to application in the world. The unit reports over 200 projects with 80 organisations, directly collaborating with industry or other stakeholders. Much of the research addresses societal concerns including sustainability, health and other highly relevant areas. Researchers in the unit realize impact along different pathways including standardization, creation of spin-offs, open-source development, and direct engagement with different user communities, including in the developing world.

While impact-related activity is clearly evident, the unit will need to improve identification of specific impacts and their root in specific research findings, in order to more clearly evidence and communicate the value of the unit's research to society. The panel also recommends that researchers in the unit consider and develop pathways to impact more explicitly and strategically as that will strengthen their cases for research funding.

### 4. Unit as a research environment

*Rating: 3*

The unit has excellent infrastructure, funding and people but lacks cohesion and shared identity.

The unit has well over 40 professors with plans to recruit a further 15 tenure-track professors. This presents an operation at an exciting scale with critical mass to tackle more ambitious research than feasible in smaller units, but such an operation requires strong leadership for which the unit has not been set up adequately. Leadership of the unit is currently a part-time role whereas a much stronger leadership structure needs to be put place, to oversee strategic development of the unit as a whole, and to foster more interaction and development of synergies among sub-units.

The unit can leverage a strong environment with excellent laboratory infrastructure to support its diverse research activities. The CIVIT lab is a particularly impressive facility for work in digital imaging and immersive technologies that stands out, also on international scale. The lab infrastructure requires continuous upgrade to remain cutting-edge, which is adequately reflected in the unit's annual budget.

The unit has an adequate personnel structure and ambitious plans for growth. However, the unit needs to develop a clearer research strategy for the unit as a whole, and a hiring strategy that is formed in accordance with the research strategy. The unit also needs to become more professional in addressing equality, diversity and inclusion with clear action plans, including for



improvement of gender balance.

## 5. Potential of the unit

*Rating: 4*

The unit has excellent potential with the critical mass of computing research brought together. There is no reason why the unit should not strive for a position in the Top 100 CS departments in the world but this will require a strategic approach and strong leadership. The unit outlined plans for “human-machine convergence” as a unifying theme, and it is good to see efforts toward a shared mission.

## UoA4 Physics

### Summary of the UoA

Physics is a part of the Faculty of Engineering and Natural Sciences (ENS) and comprises three sub-units: Aerosol Physics, Computational Physics, and Photonics. The three research fields of the sub-units have been identified and selected in order to pursue excellence. The goals of the unit are well aligned with TAU’s strategy “Together for a Sustainable World”.

### 1. Scientific quality

*Rating: 5*

The unit provides a significant contribution to world-leading research manifested by, e.g., the following achievements: four holders of ERC Starting, Advanced and Consolidator grants, as well as having candidates through to the second step in the current application round. Furthermore, coordinating one Academy of Finland (AoF) Flagship project and being a partner in a second Flagship project and an AoF Centre of Excellence, as well as coordinating a national roadmap infrastructure are markers of outstanding quality. The highly ambitious research is focused on materials, devices and modelling, with materials at the core, and results are published in high-impact journals to a very large extent. The unit is publishing at least ~150 papers per year, frequently in high-impact journals: almost half of the papers in 2020 were JUFO level 2 or 3.

The panel would like to emphasize the importance of the unit continuing to have a strategy and focus, which has been instrumental in achieving outstanding quality research.

## 2. Scientific impact

*Rating: 5*

All three sub-units have recent major breakthroughs in their respective areas, attracting international attention, and are contributing to the positive development of other units, e.g. Photonics working with the Chemistry and Advanced Materials group, and Computational Physics contributing with modelling in several other areas and TAU units. Photonics staff are furthermore coordinating the AoF Flagship PREIN, which has been rated as an “outstanding success”, and the Aerosol Physics sub-unit is a partner in the Flagship ACCC and the Centre of Excellence VILMA. Further indicators of great impact include the coordinating role of the national roadmap infrastructure FinnLight, the unit’s extensive participation in EU programs, as well as in research associations and conference organization.

The panel concludes that Tampere University could consider using this unit as a role model, to increase the total impact of the university.

## 3. Societal impact

*Rating: 5*

The unit has been outstanding in creating spin-off companies during the past decades, using support instruments from, e.g., Business Finland in a good way. The explicit ambition is to increase both the number of high-impact scientific publications and the dissemination through spin-off companies. Cross-disciplinary collaborations such as the computational physics project on ECG patterns are examples of highly relevant research. The education programmes have an explicit ambition to train researchers from the very beginning, and thus the graduating students on all levels have an excellent skill set. Graduated doctoral students are employed by companies with relevant profiles to a large extent. The Aerosol Physics Lab received the Societal Impact Award from TAU in 2021, and the work on aerosol particles has an impact on both municipal and European levels.

The unit has the potential to go even more into technical collaborations of societal relevance, e.g., using more of the modelling expertise for initiating discussions on global warming, clean energy and similar themes.

#### **4. Unit as a research environment**

*Rating: 5*

The unit has excellent infrastructure, both in terms of relevant experimental facilities and computational resources, but rely on the new TAU Research Hub. There is high-level instrumentation and some support. The sub-units cooperate to assist each other and emphasize the positive “Tampere spirit”, which is also noted by the panel. The unit is using its relatively small size (~200 persons) to its advantage, and they have a well-established culture of good leadership, cooperation and strategic discussions. The active participation in infrastructures, networks and platforms is extensive.

The personnel structure is highly adequate, with 19 relatively early career professors and a high number of postdoctoral researchers, facilitating high-throughput excellent experimental and theoretical research. The early tenure track implementation has paid off, and the unit is attracting many applicants worldwide to each announced position. The starting package is very well designed. Mobility is strongly encouraged already for undergraduate students, and doctoral students are required to have a mobility plan before getting accepted. The unit acknowledges the challenge of improving the gender balance (currently 25 % female staff) and is already using good measures.

Funding from national and international sources is well balanced between the sub-units and increasing. The panel would like to recommend the University consider implementing some type of reward for success.

#### **5. Potential of the unit**

*Rating: 5*

The goals of the unit are well aligned with the strategy of TAU “Together for a Sustainable World”. The explicitly formulated plans to maintain their focusing strategy, and to aim for large grants at the top international level in their selected fields, are both reasonable, highly ambitious and up-to-date with scientific and societal challenges and developments. It is clearly demonstrated that all three sub-units are capable of both securing considerable funding and delivering excellent research results of societal and scientific relevance, i.e. the potential is outstanding.

## UoA5 Civil Engineering

### Summary of the UoA

The BEN-CE unit is a part of the Faculty of the Built Environment. The following key research areas characterize the unit's activities in the overall level, namely structural and geotechnical engineering, building physics, real estate services, transport infrastructure and other municipal engineering structures, and transport systems and logistics. The research is covering a broad range of fields in engineering. The goals of the unit are well aligned with TAU's strategy "Together for a Sustainable World".

### 1. Scientific quality

*Rating: 3*

The self-assessment package shows a mature program built on experimental and field work, with a mix of analytical research with a focus on sustainability of the built environment. Recent new centres in transport research (Transport Centre Verne and Research Centre Terra) bring together researchers in a way that helps bridging between disciplines to address societal challenges. The self-assessment package highlights several examples of high quality scientific research. The output examples given in the "2 Top 20" report contained some publications in well-respected international journals with high impact factors. The areas of geotechnical engineering and building physics stood out as areas of excellence in scientific quality. Even though the paper reviews showed both good scientific rigor and significance, many of the papers published were somewhat incremental in the nature of the research published. It is important for the UoA5 to strive to increase the novelty and originality of their publications across the board. The UoA5 should consider focusing on developing a culture and track record of leading on EU funding, including writing proposals to the European Research Council to enhance research quality and synergies with other units within the University, which in turn should result in higher quality publications.

In summary, the quality of the papers from the unit was found to be good, with some evidence of parts of the UoA5 being at the Excellent level.

## 2. Scientific impact

*Rating: 3*

With the extent of relevant research programs and research facilities, the number of refereed journal papers is on the low side, even though the output has steadily increased over the last decade. The UoA5 still has significant room for increasing both the number of journal publications and the quality of these publications. The overall publications for the UoA5 trend more toward lower impact factor journals (JUFO 1). This is something the UoA5 needs to focus on, i.e. publishing in high impact factor journals. In addition, the UoA5 only published about 113 refereed papers in 2021, which is on the low side for the size of the UoA5. The external research funding for the UoA5 averages about 4.5 million € / year. However, even though the UoA5 has been active as a participant in several EU Framework funded projects of high societal significance, their overall part(s) of these projects have been rather small in terms of funding, with a decreasing trend of the assessment period (72,000 € in 2019 to about 30,000 € in 2021). It is really important that the UoA5 takes an active leadership role in EU Framework projects, as well as seek European Research Council Funding to enhance the scientific impact. In addition, it is important that the UoA5 focuses on increasing the number of funded doctoral students to further enhance their scientific footprint.

The number of doctoral students is on the low side for the size of the UoA5. Similarly, the number of peer reviewed papers is on the low side in comparison with typical production at civil engineering departments in research universities in Europe and the USA. However, the number of publications is increasing continuously from year to year and has the potential to increase further. Finally, given the importance of Civil Engineering to the future of society, the UoA5 should proactively seek to build networks both within the university as well as across Europe and beyond to enhance collaboration and their research “footprint” and thus the impact on the international community. The panel also recommends the BEN-CE UoA5 researchers take a stronger lead internationally, through organization of conferences and symposia, being members of editorial boards, etc, to increase their international scientific visibility and impact.

In summary the scientific quality of the unit of Civil Engineering is at the Good international level, meaning that the research of the UoA5 attracts attention in the academic community and provides useful knowledge and has an influence on the research areas within Civil Engineering.

### 3. Societal impact

*Rating: 4*

UoA5 understands its important role in society, showing strong collaboration with industry through both industry professorships and direct involvement and sponsorship of research by Finnish and Nordic companies. The UoA5's is primarily focused on applied research and development, and has strong ties with key governmental agencies. The UoA5 continually focuses on important standardization activities at both the Finnish and the EU levels, as well as active participation in committees guiding sector development. The UoA5 is also represented in the Finnish Climate Change Committee. These activities have resulted in a continuous impact and improvement of both Finnish and European standards and specifications for the built environment. In addition, the senior staff is also active as experts to sector authorities and sector companies. However, the outcome and impact of these activities has to be better communicated to the society as a whole, and the impact this gives should be used in, e.g., recruitment. Multidisciplinary is an asset to the unit which should further be developed in collaboration with other faculties. The unit should also consider developing a stronger focus on open access publications, and should continue in that direction

### 4. Unit as a research environment

*Rating: 3*

The BEN-CE unit has an extremely impressive civil engineering laboratory that underpins much of the unit's research. The BEN-CE unit should develop a strategy to further link the strong experimental tradition to more basic research and seek funding from prestigious agencies and/or programs like the European Research Council. The challenges in maintaining and updating such a laboratory are significant and expensive and may channel resources away from other exciting research investment opportunities. Hence, the BEN-CE and the university should consider exploring with the Academy of Finland the possibility of designating the laboratory as a national laboratory for the built environment in Finland. The BEN-CE unit should also discuss the possibility of linking the laboratory to the planned new TAU Research Hub and, e.g., Microscopy Center.

The unit has 10 level 4 staff, 8 level 3 staff, 36 level 2 staff and 43 level 1 staff. The level 1 staff includes 29 doctoral researchers, which is on the low side for the number of level 3 and 4 staff. It is important that the unit focus on increasing the number of funded doctoral students. The unit has been successful in recruiting recent hires focused on societally important areas such as transport and the potentially new and exciting area of urban physics.

The unit needs to ensure that future personnel is hired in accordance with a strategic research plan that is focused on further strengthening research quality, research impact, societal impact, and research infrastructure. This strategic research plan should be used to secure that the future personnel is in accordance with the research strategy, and that the unit is not spreading their resources over too many fields. The unit also needs to professionalize the routines for hiring, including developing a strategy for diversity, equity, and inclusion and gender balance. Currently, the unit include about 20-30 percent female staff. The unit should consider a strategy to increase the number of female academic staff further. A mentoring program for new staff members, as well as postdoctoral staff should be further developed.

The funding structure within the unit is heavily focused on national funding. The unit should develop a strategy to significantly increase the number of EU Framework funding, including ERC funding. The overall external funding is about 4.8 million Euro per year, which is on the low side for the number of level 3 and 4 staff. It is important that the unit take the lead in coordinating EU projects in the future. Focus on building a stronger European network should be emphasized for collaboration and mobility, and all doctoral students should have a plan for mobility. However, the unit should seek out opportunities for synergy projects both within the unit as well as with other parts of the university.

In summary, the research environment was found to be excellent in terms of infrastructure, and good in terms of personnel structure and research funding. The unit was found to have strong national collaboration and networking, but should strengthen networking, collaboration and mobility opportunities within Europe and internationally.

## 5. Potential of the unit

*Rating: 3*

The subject areas covered by the BEN-CE unit are of critical importance to Finnish and European society. The unit needs to develop a clear strategy focused on going beyond the excellent laboratory facilities that they have built, to greatly enhance their EU funding, build international networks that will lead to ambitious high value research projects, increase the number of doctoral students, and get them to the next level in terms of research quality, research impact and societal impact. The uniqueness of some of the research in building physics, cold regions engineering and fire safety is also a competitive advantage that could be built on further. Below, are some recommendations for the BEN-CE unit to consider:

- Continue to hire researchers from outside Finland and require all doctoral students to have a mobility plan for spending time outside Finland at top European universities.

- Establish a list of peer universities for purposes of benchmarking and developing strategies and goals for continuous improvement that can be benchmarked against these peer programs/universities.
- The BEN-CE unit needs a strategic plan that enables and supports the development and maintenance of a strong, deep and sustainable doctoral studies centered research culture.
- The BEN-CE unit should focus on new and emerging research areas in the built environment, such as resilient communities and infrastructure, urban physics, future

## UoA6 Automation Technology and Mechanical Engineering

### Summary of the UoA

The Automation Technology and Mechanical Engineering unit (ATME) belongs to the Engineering and Natural Sciences (ENS) faculty. The unit consists out of 150 researchers including 15 professors, industrial professors and those on the tenure track path with a high proportion (40 %) of non-Finnish nationals. ATME research is conducted in nine themes organized in a methodology/application matrix: four methodological themes (Design, Control Theory, Advanced manufacturing, Reliability and Condition Monitoring) and five application themes (Robotics, Process control, Intelligent Working Machines, Factory Automation Systems, and Aircraft Systems and Aviation). The unit has a clear forward-looking vision and their four strategic goals quality of operations, energy efficiency, digitalization, and green transition align very well with TAU's overall strategy.

### 1. Scientific quality

*Rating: 3*

The unit has very good scientific contributions in a large set of topics, essentially

- (1) methods for the design of configurable products with special focus on cost-effectiveness, minimization of environmental impact, energy and raw materials utilization,
- (2) control methods for complex and networked systems
- (3) models for the design and development of manufacturing systems



- (4) reliability analysis and condition monitoring methods for machine systems.
- (5) design and control of industrial and heavy-duty robots and intelligent working machines
- (6) factory automation systems and robot systems working in close vicinity and cooperation with humans.

The unit has produced 255 refereed publications in more than 100 well-known and important journals and outlets over the years 2019-2021. It is worth noting the high number of international co-publications (30 %) which reflects the well functioning of their international research networks. The panel encourages the unit to pursue their effort and publish more in the most selective journals of the domain in order to improve the visibility that the contribution deserves. They should also keep their eyes on high quality publications and continue to support early career scholars to work scientifically.

## **2. Scientific impact**

*Rating: 4*

The unit is generating a quite impressive amount of external funding in a regular manner: €13.4 Million in the period. For instance, in 2021 about €5 Million with 50% coming from EU projects (essentially H2020: 12 projects and one Marie-Curie ITN) and Academy of Finland (3 projects) and the rest mainly provided by Business Finland and industry-funded projects. The panel acknowledges the significance of the research conducted in ATME through a combination of basic and applied research in the co-operation with national and international research institutes and firms. Their international networks are wide-spread and they contribute actively to the scientific community by organizing and hosting conferences, taking over academic responsibilities and serving the community. Their research infrastructure with nine research labs where also other research units can do research is very comprehensive and state-of-the-art. It is worth noting that the unit has clearly established the objective to increase substantially the number of publications in very selective journals.

## **3. Societal impact**

*Rating: 4*

The unit as a whole has a very strong collaboration with industry (national and international) in almost all its topics. The heavy-duty robots and machines developed by the unit and the competence acquired in this domain are very rare and have very high application potentials in

industry such as forestry, mining and construction. Furthermore, the unit is also developing an integrated approach to the design, development and deployment of such systems. This is very important as complex automated machine systems cannot be developed and deployed on a modular basis but need a systemic perspective to leverage their whole potential. This requires extensive knowledge in the different methods and application fields of each contributing module in order to be able to operate the machines safely and to cooperate with humans. The unit has managed to develop (ColloidTek Oy) and spin out successfully several complex system technologies (e.g., Himmeli Robotics; UNEXMIN GeoRobotics Ltd). Over the last three years, they have filed 12 high-tech inventions. The unit plays an active role in designing and implementing ecosystems and networks (e.g., Sustainable Industry X (SIX) ecosystem). The panel encourages the members of the unit to enforce their outreach toward society and the general public.

#### **4. Unit as a research environment**

*Rating: 4*

The unit has built and exploits an excellent infrastructure in terms of equipment: several industrial robots and manipulators, heavy-duty machines including mobile manipulators (a unique set of machines) and means to program and deploy them in realistic settings (equipment as well as a 4000 m<sup>2</sup> test area). The unit is composed of research groups led each by a professor, developing their own competence. The research groups are very coherent and driven by a common cause while at the same time the research groups are also collaborating closely in a number of projects which need close integration of several competences. This effective ability to conduct integrated development is very valuable and will allow the unit to conduct very ambitious initiatives. ATME has been successful in national and international recruiting, especially based on their master's program. The panel advises to improve doctoral candidate processes and increase the number of doctoral graduates.

The panel recognises that the unit is hiring at international level and has attractive starting packages. The panel suggests taking effective measures in order to make substantial steps towards gender balance: as of today there are 15 female and 146 male staff members, and 2 female professors out 15.

## 5. Potential of the unit

*Rating: 4*

The unit has developed and implemented a strategy and ambition to reach very high impact and international visibility. ATME is involved in 4 Profi calls launched by the Academy of Finland Intelligent Machines, Intelligent Society (INSO) and Imaging Research (out of 6 for which AU is participating). They have elaborated and launched new promising topics like cognitive robotics and human-robot co-working systems in factories. They see the need for and have already started interdisciplinary collaboration with computing science, social sciences, humanities, and industrial engineering. ATME is also very heavily involved in industry-academic collaboration corresponding in its core topics. The unit is a key member of the very ambitious SIX (Sustainable Industry X) ecosystem adopted by Finland: SIX Mobile machines (technologies and services for mobile work machine) and SIX Smart manufacturing (green manufacturing). The unit has an excellent perspective and appears as ready, after the last restructuring and the recent recruitment, to make substantial advances in coherence with the strategy of the University.

## UoA7 Industrial Engineering and Management

### Summary of the UoA

IEM is from a personnel perspective part of the Faculty of Management and Business but does most of its teaching and research in the engineering domain. This represents the major challenge for the unit as will be seen from our evaluation. IEM is composed of five research groups that are quite distinct from each other: Center for Innovation and Technology Research (CITER), Center for Research on Project and Service Business (CROPS), Centre for Safety Management and Engineering (CSME), Cost Management Center (CMC), and Operations and Supply Chain Group (OSCG). Their research covers a broad range of fields in the industrial engineering domain. The five research groups are coherent in their individual fields of research but do not have much overlap among them. The unifying research theme of IEM on “sustainable value creation in technology-driven organizations” complements and supports TAU’s strategy “Together for a Sustainable World”.

## 1. Scientific quality

*Rating: 3*

The overall unit contributes good to excellent research manifested by the following achievements: One Academy of Finland Research Fellow, two Academy of Finland projects, two EU H2020 projects, and several Business of Finland projects. The panel encourages leveraging the positive direction of funding with applications for excellence funding, e.g. , ERC grants in the future. Some professors have an excellent scientific standing but the panel is missing a consistent output on a high level for the whole unit. While they have consistently increased the number of high-quality scientific publications over the last years, the focus should be even more on JUFO 2 & 3 publications. The research in the groups is internationally recognized and in many cases of excellent novelty and ambitiousness. The panel recommends that the unit continues to strengthen the fundamental science activities while maintaining collaboration with companies as research sites and partners.

## 2. Scientific impact

*Rating: 3*

The unit's number of refereed journal papers is compared to international standards on the lower side, even though the output has steadily increased over the last decade. The panel acknowledges a positive and increasing trend over the last years, be it through the doctoral program curriculum or participating in interdisciplinary research consortia. Some senior scholars at IEM are internationally highly visible by taking over editor's and associate editor roles as well as being members of editorial boards but the unit as a whole needs to strive for more international visibility. The same applies for international network and impact. Selected scholars hold central positions in leading associations of the field (EURAM, IPDM). This could serve as a good starting base for also increasing early career scholars' international visibility. The unit serves highly influential topics and the panel expects that this will reflect in a stronger scientific impact over the next years. In summary, the scientific quality of the unit is at a good international level, meaning that the research of the UoA7 attracts attention in the academic community and provides useful knowledge and has an influence on the research areas within Industrial Engineering.

### 3. Societal impact

*Rating: 4*

The unit has a strong outreach to business, policy, and society. Especially senior scholars have or had expert positions in topical national and international development programs. They provide governmental guidance with consultative discussions and statements and their research has found its way into high-level political papers, e.g., IPCC report (AR6 WGIII chapter 11). The unit as a whole has strong collaborations with industry. They have one industry professor. About 50 % of their candidates are part-time doctoral candidates and work elsewhere, herewith transferring their knowledge directly to actual challenges. The unit has a strong tradition in intertwined research projects with companies. Multidisciplinarity is an asset to the unit which should further be developed in collaboration with other faculties, along similar lines as the “Citizen as pilots of smart cities” project. The unit could in fact become a major driver of platform projects across the university targeting the grand challenges as they have the methodological and project management knowledge running this kind of initiatives along their topic expertise. The academic staff regularly writes textbooks and offers a wide range of courses through Open University.

### 4. Unit as a research environment

*Rating: 4*

The panel found a very positive and collaborative team spirit within the unit. They have developed a sound strategy and development plan to move forward. The unit has come quite a way developing from a very teaching-oriented group to a much more scientific unit. Both, their topics as well as their research methods are highly relevant and timely. Their doctoral program is sound and targeted towards the needs of a research-oriented unit. They are engaged in several multi-disciplinary research projects across the university as well as in national and international networks. They have a good quote of female to male researchers. The percentage of international researchers could be increased as well as incoming and outgoing exchange programs. Based on their international master program, they can recruit good doctoral candidates. This should be further supported by promoting the master and the doctoral program stronger internationally. The percentage of permanent staff is quite low.

## 5. Potential of the unit

*Rating: 4*

The goals and strategy of the unit are well aligned with the strategy of TAU “Together for a Sustainable World” and the panel sees a large potential to further develop this and to make the unit an important player and platform orchestrator in the field of sustainability. However, the panel recommends for the unit to openly discuss with university leadership whether to better integrate the unit into the Faculty of Engineering and Natural Sciences as this would leverage both, research and teaching efforts. The close contact with industry is an asset for receiving relevant topics for research and doctoral studies’ projects, financial support, and bringing relevance for the society. It should however not limit the focus on stronger fundamental research for reaching a higher scientific impact. The unit already has researchers being granted financial support from excellence funds like Academy of Finland. The unit should think about extending this to other sources, e.g. ERC grants. The program of the doctoral program could be further extended and promote even more multi-disciplinary and international research projects. The currently individual organized Cotutelle and exchange programs should be institutionalized.

## UoA8 Architecture

### Summary of the UoA

The unit has identified 3 Focal Areas (FA) for its research, i.e., (I) Sustainable Urban Form, (II) Sustainable Architecture and (III) Humanistic Reflection. They are in line with the strategy of TAU “Together for a Sustainable World”. In the following they will be mentioned using the abbreviations FA I, II and III.

Six Research Groups (RG) of UoA8 work within and across the three Focal Areas. They are (A) ASUTUT – Sustainable Housing Design Research Group, (B) Management of Built Heritage, (C) ReCET – Renovation and Circular Economy Transition, (D) Seinäjoki Urban Laboratory, (E) SPREAD – Spatial and Speculative Research in Architectural Design, and (F) Urban Planning Research Group. RG (D) is located rather far away from Tampere, is very small, and only plays a minor role in the unit. The research orientation of the units focuses on specific aspects of sustainable urban development as formulated in the Sustainable Development Goals of the United Nations, especially Goal No. 11, and the New Urban Agenda. In the following, they will be mentioned using the abbreviations RG (A) to (F).

UoA8 is part of the Built Environment Faculty. During the past years, there has been a major shift from practising designers to academic staff with a doctoral degree among professors and senior researchers. This has made UoA8 distinct from other architectural units of many universities where design still plays a leading role, research paper publications in (international) scientific journals with high impact factors still do not play a decisive role, and practical work, e.g. in private planning and design companies led by university professors, has a relatively high relevance for university work.

Taking these factors into consideration, the panel acknowledges and highly appreciates the progress, which UoA8 has made regarding its research quality, research and societal impact, and its role as a research environment. Moreover, it recognizes an excellent potential of UoA8 to become a leading research unit in its field in the future.

## **1. Scientific quality**

*Rating: 4*

The research of UoA8 is internationally recognized and of excellent quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness compared to other architecture departments. For example, the work of RG (C), i.e., regarding precast concrete for a circular economy, circular construction in regenerative cities, and circular economy in building construction in Tampere, belongs to European top-level novel research. The use of virtual reality will open potential new avenues of research. Another example is the original work of RG (F) regarding healthy urban green environments, e.g., on autoimmune defence and living environment, which is done in an excellent multi- and interdisciplinary way and has attracted a lot of public attention in Finland and abroad. It constitutes a rather unique topic in the national and international architectural and spatial planning related research environment with great future potential. Similar observations can be made regarding projects in RG (E), theoretically based on speculative research, which is a rather novel field in architecture, RG (A), e.g., on agile, ecological and inclusive design, and RG (B), e.g., analysing the Finnish industrial wood construction and understanding the traditional built heritage. Their work is novel, original, significant and scientifically ambitious. Moreover, it is well linked within TAU, e.g. with social sciences, construction engineering and others, and beyond, nationally and internationally.

## 2. Scientific impact

*Rating: 3*

Taking the rather recent shift in the research orientation into account, UoA8 already attracts a lot of attention in the academic community. It provides useful knowledge and has an influence on its research field. For example, through EU funded projects and related research cooperation, UoA8 manages to successfully communicate its research approaches and results within the European research and development context.

Thus, the work of the unit is becoming increasingly recognized in the national and international context. However, the efforts of the unit and its scientific ambitiousness, i.e., to become one of the leading units in its field should be enforced. The uniqueness of the unit's research should be more actively highlighted. A joint strategy may help to define the main future focus of the unit and to clarify the synergies between the different research groups.

Taking its size into consideration, UoA8 provides some very good and well received scientific publications, has a number of collaborations with excellent international research institutions, is linked with relevant national and international research associations and networks, has acquired an impressive number of EU funded projects and is strongly involved in the Finnish architectural research landscape, e.g. in a co-organizing role of the ATUT 2022 conference, i.e., the 14th Symposium of Architectural Research in Finland.

UoA8 should continue its efforts to gain more national and international leadership and visibility in its research field. The efforts of the unit to gain more international visibility are well recognized. However, an internationalization strategy could provide more guidance and focus.

## 3. Societal impact

*Rating: 5*

The research of UoA8 is outstanding in terms of reach and significance. The research is highly relevant and provides new knowledge and solutions that significantly benefit the society at large, and profoundly increases understanding on a number of phenomena.

UoA8's reach includes a large number of industry partners. The unit cooperates very well with a number of municipalities in Finland and other European countries, e.g. in European projects and local case study research. Moreover, UoA8 is strongly involved in government activities, and through the Tampere Urban Research Network for Sustainability (TURNs), which has been co-initiated by senior staff from the unit, UoA8 targets the civil society through innovative dissemination and public education activities.



The research of the unit is highly significant, e.g., regarding UoA8's work and involvement regarding the Land Use and Building Act, the elaboration of National Building Regulations, as well as industry standards, public tendering priorities and the new Architecture Policy (2022-2035) in Finland.

Regarding the society at large, UoA8 contributes to producing increasing understanding on different phenomena, such as urban related health issues, urban biodiversity as well as circular economy in the construction sector.

UoA8 is also outstanding in disseminating its results to external stakeholders, including policy makers, and the society at large, e.g., through media/TV appearances, interviews, e.g. on overheating in homes during the heat wave in 2021, public events, e.g. the Green City Symposium (through TURNS), and public lectures. All these activities have received substantial resonance.

#### **4. Unit as a research environment**

*Rating: 4*

The research environment compares well to the best international units in the field in terms of infrastructure, personnel structure and research funding. The unit's national and international collaboration, mobility, networking, and recruiting are active and relevant.

UoA8's infrastructure is impressive, e.g., regarding the premises of the unit and the creative research environment they promote, the recently established EVA Laboratory supporting work with the help of virtual reality, the Healthy Buildings In-Situ Monitoring Kit, which facilitates field work, and the cooperative use of other laboratories of TAU, e.g., of construction engineering.

The personnel structure supports conducting high-quality research. The management is aware of the necessity of a well-balanced gender structure. International orientation among staff members is rising. The faculty supports doctoral researchers and provides motivating support. The panel encourages the unit to evaluate the size of their doctoral program. Marie Skłodowska-Curie Fellowship are seen as an important additional funding source for supporting young researchers.

The funding structure is well-balanced. UoA8 has seen an impressive growth of EU funded projects.

The unit is increasingly international in terms of networking and collaboration. EU projects and other international activities have helped to sharpen the unit's international profile.

Mobility and national and international networking are seen as highly relevant. There are mobility funds, e.g., from Fulbright Finland, the Academy of Finland (AoF), and from TAU.

## 5. Potential of the unit

*Rating: 4*

The aims of the unit in terms of research are significant, and they show a level of ambitiousness that is at an excellent level. The unit's planned actions to reach their aims are feasible. The unit shows very good future potential.

UoA8 strategic statement consists of a clear mission and vision. The mission is well formulated, significant and focused. The vision is also clearly formulated, and it highlights the importance and significance of scientific research.

Regarding the level of ambitiousness UoA8 states that it wants to become an internationally renowned centre of excellence in spatial and technological solutions for sustainability in the urban and architectural scales. This is supported by the excellent quality of research and the clear commitment of the management to consequently follow the defined path regarding research excellence. Consequent management and a related reward system will be highly important in the future.

The planned actions to reach its aims are relevant, reasonable and feasible. They need to be further elaborated, continuously updated and consequently monitored in the future.

## II. PANEL FOR HEALTH

### UoA1 BioMediTech

#### Summary of the UoA

The BioMediTech Unit is one of the two Units in the Faculty of Medicine and Health Technology (MET). The BioMediTech Unit integrates engineering, biomedicine, and biological sciences in research and education.

The BioMediTech Unit combines biomedical research fields from basic research, (bio)engineering, and technology to medicine and patient care, to develop multidisciplinary solutions in knowledge and in methodologies towards addressing modern challenges in precision medicine or personalized patient care. This unique combination, along with strong interaction with clinical medicine and other healthcare stakeholders is considered a strategic advantage in the field. In joint Research Centres, the strengths of BioMediTech are synergized with clinical expertise towards translational research and clinical utilization.

Research is organized in three thematic areas:

- **Biomedical engineering research – towards novel methods and tools** (Biomaterials, Biomedical micro- and nanodevices, Wearable and implantable technology and physiological measurements, Bioimaging and medical physics);
- **Biological life sciences- towards understanding biological mechanisms to develop novel treatment modalities** (Cell and molecular physiology, Molecular Immunology, immune mediated pathogenesis and immunopharmacology, Cancer research, Stem cell research);
- **Integrative research topics and profiling areas** (Bioinformatics, Computational biology and in-silico modelling, Biophysics, Body-on-Chip and Organ-on Chip research, Health data science).

#### 1. Scientific quality and impact

*Rating: 4*

The merger of the University of Tampere and Tampere University of Technology has brought together combinations of technological expertise and science. The Faculty of Medicine and Health Technology is very large with a few areas that are outstanding, some that are excellent,

but others where the strengths were less obvious. The engineers were noted to be excited by the increased proximity to the Medical School and University Hospital and the merger has brought together complementary Research Centres and Centres of Excellence.

Tampere University of Technology has had long term strength in the development of biomaterials, medical devices and their clinical application. However, this requires strength in biology which was not obvious to the panel. We were informed that Tampere University has no Centres on biology, chemistry, or pharmacology, creating a risk that some research areas may suffer from a lack of supporting basic science. In medical devices, it will be key to grow medical engineering and to think about synergies with the university's strengths in medicine. There does appear to be a landscape for commercialization, but it is not obvious to the panel or to the researchers.

Some of the new research areas are exciting and the recent award of an ERC for bioinformatics analysis applied to toxicology indicates the highest scientific work. The application of artificial intelligence and machine learning to cancer diagnosis and treatment has significant potential clinical application. While these areas are still in the development phase, we did not get the impression of clear knowledge of commercialization potential.

The percentage of staff from outside Finland is high and the number of papers with international co-authors is impressive. However, it was noted that, in a significant number of these papers, Tampere staff were not the leading authors, indicating potential for enhancing Tampere's leadership of international projects. The support for academics developing ERC or similar grants was noted to be excellent, from the initial grant writing support to practice interviews for short-listed academics. It appears that some of this support is available for other funding schemes, e.g. Marie-Curie, but early career staff were less aware of these opportunities.

The areas of research strength were obvious, but other areas might benefit from concentration, additional support, or re-direction.

The long-term career prospects for PhD students, postdocs and non-tenured academic staff does need clarifying. There seemed to be little interest among those we spoke to of developing spin-offs or moving to industry. We also sensed that there was more scope for informal exchanges of information which would be very beneficial, these could take the form of events such as "sand pits" and Away Days. We also sensed that early career researchers had little sense of ownership of the strategies pursued by their Unit, faculty, or university.

**Actions to consider:**

- identifying ways to improve the interaction and collaboration among existing Research Centres and identifying opportunities to create new ones, including those based on Centres of Excellence;
- developing, through a fully consultative process, and communicating a long-term strategy for the Unit, supported by dedicated funding for infrastructure development;
- strengthening communication channels so that decisions made at the most senior levels of the University are disseminated clearly.

**2. Societal impact**

*Rating: 3*

***Impact on research innovation and technology transfer***

The BioMediTech Unit and its two service and research institutes (Regea Cell and Tissue Center (Regea), and the Finnish Hub for Development and Validation of Integrated Approaches (FHAIVE)) undertake multidisciplinary, application-oriented research. The BioMediTech Unit has an outstanding research infrastructure at both campuses. It has excellent engineering and biomaterials capacity combined with high level expertise in technology and promotes translational research actions and collaborations. Commercialization activities by the Unit have produced successful outcomes that are translated into clinical applications. The Unit has been one of the most successful units at TAU in attracting Finland's Research to Business grants, with more than €3M funding in the last three years (2019-2021). These grants are intended to nurture opportunities for starting businesses (as Spin-Out/Start-Up companies) or licensing technology. Start-Up companies have emerged from BioMediTech, which are in different phases of commercialization, including Stemsight (founded in 2021 to develop a biomaterial and stem cell corneal transplant product); Fluivia (comprehensive solutions for blood-based cancer genome profiling and residual disease detection); Olfactomics (surgical smoke sensors to detect cancer), and Injeq (novel needles detecting the tissue surrounding the tip, which has a CE-mark). Some groups have also strong collaborations with local and federal MedTech and pharma companies. Overall, the activities of the BioMediTech Unit have contributed to novel research findings and have generated new businesses creating local employment.

***Impact on clinical translation***

Over the past three years closer collaboration with the faculty's Clinical Medicine Unit and Tampere University Hospital was pursued, but not all groups have fruitful collaborations. We heard from many we met that the proximity of the Tampere University Hospital offered many

potential collaborative opportunities, especially as most senior clinicians are also researchers. These opportunities include access to patients and clinical material, identification of research questions, testing and scaling up of innovations, and collaboration with industry. We heard of existing collaborations, but gained the impression that these are often ad hoc, based on personal connections. We struggled to ascertain the incentives on both hospital and university staff to collaborate, beyond curiosity or pragmatism. We were unclear whether medical specialists were expected to participate in research. While we were made aware of some formal high-level links between the hospital and the university, we were unable to identify any forum or other structure that could encourage staff and students of the two Units to discuss synergies or develop new ideas.

### ***General regional impact***

Universities and health facilities, individually and combined, are being seen in some countries as anchor institutions, large organizations that are fixed to a location (unlike, for example, large factories that might close) and have a significant stake in their local area. They have large and valuable assets that can be used to support their local community's health and wellbeing and tackle health inequalities, for example, through procurement, training, employment, professional development, etc. Tampere is especially well placed to play such a role, consistent with the Finnish government's commitment to Health in All Policies and the Wellbeing agenda. However, we did not get the impression that this potential was widely recognized. Where there was a recognition of the wider role of the university, we gained the impression that any contribution would be to Finland as a whole, rather than to the local community. While understandable, given the administrative structure of local government in Finland, with many small municipalities, we feel that there are opportunities to look at the experiences of universities elsewhere that have adopted this approach and ascertain a potential Finnish model.

### **Actions to consider:**

- methods to increase understanding among staff and PhD students of the steps needed to progress their developments from the laboratory "to patient" or to start a spin-off
- mechanisms to further strengthening collaboration with healthcare stakeholders, especially with the Tampere University Hospital towards enhancing translational research impact
- opportunities to increase the number of joint publications with healthcare stakeholders in high impact journals, taking account of the competence and skills of the PIs in the Unit.

### 3. Unit as a research environment

*Rating: 3*

#### ***Research laboratories and equipment***

The BioMediTech Unit has excellent access to infrastructure, including macro, micro, and nanodevice manufacturing, various biomedical imaging units, protein production and analysis core units, and two industry-standard cleanrooms, as well as GMP manufacturing and clinical trial services. The panel felt that the infrastructures and facilities clearly provide crucial resources and services to the researchers of the Unit to foster innovation and conduct world-class research.

#### ***Research Personnel***

The BioMediTech Unit has 310 staff members, with personnel who mainly concentrate on teaching tasks, while 45% of the Unit's staff consists of post-doctoral researchers, PhD students and academic research assistants. The number of early career researchers in the Unit is high and has led to 51 doctoral degrees in 2019-2021. However, more than 40% of the academic staff are not employed by the University but are on resource agreements, short term contracts, or scholarships. In the discussion with the early career scientists, it became clear that funding is not always secured for the full duration of the PhD, and PhD students have in many cases to secure their own funding for one or two years at a time, something that should be the responsibility of the group and Unit leadership. This lack of a complete set of PhD funding will apply additional stress to the students in an already difficult time in their career and risks discouraging the best national and international PhD students. Despite being enrolled in structured PhD programs or the post-doctoral community within the Unit, many early-stage investigators do not have career guidance or individual career development reviews, with no structured career development in place.

The Unit leadership and professors have generally a good understanding of the Unit's strategic direction. The Unit provides an environment where the most successful investigators thrive, while level 1-3 investigators, who are not affiliated within one of the main Centres or occupy niche topics that are away from the mainstream research topics, lack strategic direction or inclusion. Overall, there does not seem to be a strong management structure within the Unit; developing one would be beneficial. There is a lack of a good communication strategy between the Unit's leadership and researchers at levels 1-3, and between TAU leadership and many level 1-4 researchers. Most researchers see their biggest challenge as securing sufficient external funds to pursue their research topics and maintain the infrastructure.

**Actions to consider:**

- structuring a career path for early career researchers, including career development advice, ranging from grant writing to applications for further Fellowships in Finland and abroad to developing spin-off companies, thereby commercializing their research for the benefit to them, the University and the local population;
- whether it is desirable to allow PhD students to start without a clear funding track for 4 or 5 years, given the stress that this induces;
- maximizing opportunities for international exchanges for early career researchers;
- implementing continuous professional development for all supervisors and managers;
- providing clarity to tenure-track staff about the expectations for award of tenure;
- exploring the possibility of professionalizing the core facility services, for example by accrediting the protein core facility, making it more attractive to external stakeholders, which could provide additional external funds.

**4. Potential of the Unit**

*Rating: 4*

The planned research activities build on existing skills, knowledge, and ongoing research activities of the collaborating PIs and seek to integrate further disciplines and methodologies from biology, biomedicine, physics, data science, and nanotechnologies. The research aims of the Unit are significant and demonstrate potential future growth.

The Unit has research areas that are internationally highly competitive and recognized as such (Centres of Excellence and Profi). These have a strong track record of attracting competitive funding, establishing international collaboration, and providing strong basic and applied research. There is, however, scope for greater collaboration to strengthen the Unit's impact (groups working on personalized disease models and deep phenotyping and basic biomedicine research; data science and integration of data sources to translate findings towards personalized medicine).

The Unit is in an advantageous position because it accommodates the diverse expertise necessary for achieving its objectives. The Units' strengths are on integrating biomedical engineering, biotechnology, and biology with clinical research. There is expertise in submission of patents, their development into awarded patents and finally spin out companies that can benefit the University, the researchers, and patients. However, while some steps are taught at Master's level, it was not clear that PhD students are exposed to knowledge of these processes, reducing their awareness of the opportunities for commercialization and subsequent benefits.



**Actions to consider:**

- developing an overall strategy for prioritization of existing and future work;
- strengthening international collaboration, establishing wider strategic collaborations with selected partner organizations, including mechanisms to enhance student and researcher exchanges;
- intensifying efforts to increase further EU and other international funding (e.g. NIH, Foundations) especially in key areas including cancer and healthcare digitization which coincide with the targets of the Horizon Europe program;
- ways of attracting high level international recruits at the PI and professorial level as well as early career researchers.

## UoA2 Clinical Medicine

**Summary of the UoA**

The Clinical Medicine Unit is one of two units hosted under the Faculty of Medicine and Health Technology (MET). The two units share common facilities and infrastructures to some extent but based on the site visit it is unclear how much the researchers and clinicians at the Clinical Medicine Unit utilize these for clinically oriented projects. As per the self-assessment report, research activities in the Unit are organized under eleven research topics with specific research themes within each topic. Since 2021 five of the thematic areas have the status as Research Centres (RC), which seems to be a strategic measure of the Faculty to strengthen certain research areas: The five Centres are the Prostate Cancer Research Center (PCRC), the Finnish Cardiovascular Research Center Tampere (FCRCT), the Celiac Disease Research Center (CeliRes), the Tampere Center for Child, Adolescent and Maternal Health Research (TamCAM), and the Research Center for Vaccine Development and Immunology (VACCIM). Examples of on-going research activities and output were presented during the site visit from CeliRes and TamCAM. The remaining six areas are within Cancer (other than prostate cancer), Neurology and Neurosurgery, Psychiatric research, Respiratory research, Occupational Health and Occupational Medicine, and Vision and eye research. Additionally, orthopaedic research was featured in the self-assessment report, but it was not listed among the specific research topics noted above. From the self-assessment report, it is unclear how the thematic areas and RCs are selected, and if there are strategic instruments to coordinate research between the thematic areas.

## 1. Scientific quality and impact

*Rating: 3*

Scientific strengths of the Clinical Medicine Unit include an established culture of research, capabilities for multidisciplinary collaboration, and a few research groups that are highly productive and internationally visible. Thus, some of the Unit's research groups enjoy an established status within their scientific fields and play a leading role in several national and international collaborations whereas struggle to find access to resources or funding to continue or even initiate new research projects.

The aggregate bibliometric measures of the Unit are very good. Notably, several individual Unit members are amongst the most highly cited scientists in their fields globally. Over 50% of the peer-reviewed publications include international collaborations. It is recognized that the Unit also plays an important role in disseminating medical knowledge to non-academic Finnish physicians through national journals.

Of note, much of the information in the self-assessment report (such as the bibliometric measures) is provided at an aggregated level, which does not reveal potentially large differences between research groups in the Unit. Based on the scientific presentations during the panel visit, it indeed appears that the highest scientific impact frequently stems from some of the few established Research Centres. Overall, the research interests of the Unit may be too broad so that a relatively small faculty with a heavy teaching and clinical load could strive for a leadership role in all the 11 research areas listed.

Additionally, a better integration and collaboration within MET between the two Units would be warranted, given that only a few research projects span the full continuum "from bench to bedside" that is a characteristic of a leading academic medical centre (projects covering in vitro mechanistic discoveries, in vivo model organism validations and clinical correlative studies that then lead to interventional clinical trials; or research and development of devices by engineers and physician-scientists that similarly lead to trials on diagnostics or treatment strategies).

Clinical trials are an important part of the research continuum of an academic medical institution and of the service offering to e.g. cancer patients with limited treatment options. The panel noted that hypothesis-driven, investigator-initiated clinical trials appear to be lacking somewhat in the Unit (although data in this regard were not readily available). The Clinical Research Services team appears to be very knowledgeable and helpful, and thus an active outreach to the faculty (also on the basic science side) by them would be helpful.

**Actions to consider:**

- The Unit should consider priority areas for future development and utilize the cross-disciplinary approach featured within the Research Centres as a model for success. This would require meeting of the minds within the Faculty, in order to secure financial and other resources to deepen research capabilities in the Unit.
- Despite the high ambition to build a strong cross-disciplinary environment and collaborative mechanisms across the Faculty, the two Units are still quite separate. While there are good examples of the contrary, it is suggested that the two MET Units should both formally and informally drive interactions at all levels within and beyond MET.
- The Unit, together with the Faculty, should reconsider its name, specifically whether it should better reflect the mission of the Unit to be interdisciplinary.

**2. Societal impact**

*Rating: 3*

The Unit's development of new biomarkers, clinical guidelines, new treatment protocols and digital health services outlined in the self-assessment report have produced important societal value and human benefit. It was also noted in the report that the Unit's research had proven to be agile and able to respond to societal challenges and needs such as those related to the COVID-19 pandemic where the Unit contributed with a variety of research and public education actions.

Research groups appear to have solid links to the commercial sector, with researchers acting as experts for companies and in patient organizations. It is noted that the Unit produces roughly one invention disclosure and patent application annually, and technology transfer actions have resulted in several spin-off companies. Nevertheless, these activities appear to be quite sporadic, and dependent on the persistence and entrepreneurial interest of individual investigators.

A central theme for any larger clinical department would be the wider role in society. One aspect of this is public and patient involvement. This takes many forms. It can involve co-design of research, in which those who are likely to be impacted by an intervention (such as a new model of care or treatment), are brought fully into the design of the research. Or it may simply be the inclusion of "experts through experience", who may be patients or caretakers, on project steering groups. Or innovative forms of public engagement, especially in ways that take advantage of social media, apps, and other innovative methods. The panel did, however, find very little evidence that this happened to any significant extent. Indeed, when the issue was

addressed during the site visit the panel did not feel that this responsibility was accepted as a legitimate activity for academics.

The panel noticed during meetings with staff the lack of administrative support to researchers at the Unit involved in research that need pragmatic solutions to be successfully conducted. It was not possible for the panel to understand the root causes of this problem, but the University should review its routines and administrative support, to ensure that it is meeting certain needs.

#### **Actions to consider:**

- A more systematic approach to advancing innovations should be facilitated by the Unit and Faculty together with the University.
- It would be advisable for the Unit together with the Faculty to find internal instruments to promote public and patient involvement in future projects and to review the experience in other countries in order to develop guidance on good practice that could be adapted to the Finnish context.

### **3. Unit as a research environment**

*Rating: 3*

The Clinical Medicine Unit has very good access to different facilities and infrastructure for today's demand of modern clinical research via the collaboration with the BioMediTech Unit as well as the Faculty with its Core Facility services and animal facility. In addition, the close proximity of the campus to the University Hospital and the establishment of Fimlab provides possibilities to perform research utilizing different technologies in laboratory medicine, e.g. clinical genetics, immunophenotyping, protein analysis, microbiology, and clinical chemistry. Thus, it is the panel's view that crucial infrastructure and resources to the clinical researchers of the Unit are provided for, enabling an environment for research that encompasses translational research, clinical medicine, and epidemiology. Of particular interest is the access to biobank facility and various registries. However, it is not clear as to how many of the thematic areas operate closely with the BioMediTech Unit in a systemic way, or whether collaborative research is merely based on an ad hoc need. Are the investments in good infrastructure utilized for clinical research to the extent that should be considered possible in relation to basic and applied research? Whether the research services are at a sufficient level to promote clinical researchers to initiate new research projects was also unclear based on the documentation and during the site visit. The panel identified the usage of common labs, facilities, and office space as a true advantage for staff at both Units to meet with each other, but most clinical researchers do not seem to be encouraged to take advantage of this opportunity.

Furthermore, despite good access to these resources, the financial costs for researchers of the Unit using them seem to be a hurdle to pursue clinical research. In addition, it seems that in particular young clinicians that are still establishing themselves as independent investigators, and dividing the work between clinical duties and research, experienced a distance between the University and the University Hospital due to the lack of understanding of the reality of daily demands for many clinicians and actual limitations in accessing resources at the Faculty.

The number of early career researchers is rather low and not fully adequate to ensure long-term continuity of the Unit's research. Most personnel in career levels 3 and 4 have shared work contracts between TAU and the Tampere University Hospital. The Unit has awarded 60 doctoral degrees in the period 2019-2021, and the number of doctoral students under supervision in the Unit is 148.

Regarding internationalization of the Unit, only 7% of the employees are non-Finnish. The panel recognizes the challenge due to language requirements to speak Finnish at the University Hospital, but at the same time identifies a low ambition in trying to establish a more diverse and inclusive research environment. Although many research groups are extensively involved in European or international networking and research projects, longer visits and exchange as well as international mobility among staff members seem to be underprioritized.

#### **Actions to consider:**

- The Unit should pay attention to the gap between the University and University Hospital that could compromise the future of early career clinical scientists as well as continuous learning by more established clinicians.
- The Unit should create a more transparent and supportive model for career development of early career researchers. In particular, the situation for PhD students with a medical background should be taken into consideration with focus on long-term commitment of supervisors, working conditions, and financial issues.
- Internationalization of staff members and early career researchers should be encouraged as short visits at international institutions and environments would lead to network building and potential joint projects.
- The panel recognized that a greater centralization of all capabilities related to clinical trials in the University and the Hospital would be desirable. The awareness and visibility of different service structures provided by the Hospital, Faculty and University could also clearly be improved.
- General administrative support that is provided for scientists at the University level should be reviewed and enhanced as applicable – a direct dialogue between scientists and the University administration of the needs and opportunities is recommended.

#### 4. Potential of the Unit

*Rating: 4*

The overall future goal of the Unit is described as “continue producing high-quality research, publications, and results in the benefit of the population”. Reaching this goal would develop proximity between the two Units within the Faculty as well as the University Hospital. While the Unit has tremendous possibilities for both hypothesis-driven and patient-oriented clinical research projects, the panel has identified some challenges that need to be addressed for future success. Four tasks for the future are identified in the self-assessment report.

Clearly the Unit has benefited scientifically from the establishment of thematic areas and Research Centres, and some of these are highly productive and internationally very well known. The Unit should continue to build on these as good examples, however, at the same time there is a risk that they are insufficiently agile and inclusive to address future significant and rapid changes. The Unit needs to strengthen research overall and find incentives and instruments to allow for all staff to perform clinical research and/or more applied research in collaboration with colleagues at the BMT Unit. Rebuilding collaborative ways between different research groups to find new projects are brought to attention in Future plans, and the panel agrees. The Unit together with the Faculty also needs to find new funding opportunities. A priority will be to identify special competences among future staff that can both drive the field forward and operate as service providers for the research demand at the Faculty and Unit. The panel takes for granted that the Faculty and the Tampere University together will address the issues in future priorities including service and support functions.

Most of the recommendations for the future have been listed above under each section. However, the panel wants to encourage the Unit to enhance collaboration and networking with the BMT Unit to strengthen the research at the University. At the same time, we recommend the Unit to take advantage of all the scientific competence and expertise among its staff members to challenge the current educational programs at the Faculty to build new opportunities for education, training, and life-long learning amongst the Unit stakeholders.

## UoA3 Health Sciences

### Summary of the UoA

The Unit is part of the Faculty of Social Sciences, conducting research at the intersection of health and society. The Unit's stated primary goal is to improve understanding of factors, which affect health and well-being, but also to promote and protect health and well-being by research on health policy, health care practices, and organization and by interacting with civil society, health professionals, and policymakers. Research interests of the Unit include the causes, prevention, care, and control of communicable and non-communicable diseases, as well as mental health disorders and disabilities; inequalities in health and health care; and the organization and effectiveness of social and health services.

The Unit is involved in several profiling initiatives: New Social Research (NSR); Sustainable Welfare Systems (SWS); Tampere ImmunoExcellence (TIE); and Health Data Science (HDS). Moreover, the Unit plays a key role in the new university-level strategic initiative, the TRANSFORM research platform which links several faculties and research groups and will provide opportunities to evaluate ongoing health reforms in Finland.

The Unit benefits from access to several important sources of data, including the Vitality90+ study. It uses a wide range of methods, both qualitative and quantitative, and a willingness to seek collaborations where particular skills were not available within the Unit, for example in App development.

Having read the description of the work of the Unit, as set out in its self assessment, we had some concern about the risk of fragmentation, given the diversity of interests. However, our fears were largely allayed in our interviews and the presentations, where we saw a commitment to multidisciplinary work, within and beyond the Unit and encompassing collaborations across the Faculty, University, country, and internationally. The Unit demonstrates an impressive body of research in health sciences, a commitment to societal impact, especially thorough public and policy engagement, and an extremely supportive environment for early career researchers.

There are, however, some things that could be addressed that would enable the Unit to realise its considerable potential.

## 1. Scientific quality and impact

*Rating: 3*

**Context:** In common with the other units we reviewed, we are faced with the challenge that the Faculty has undergone significant organizational change. First, the Schools of Health Sciences and Social and Cultural Sciences merged to become the Faculty of Social Sciences in 2017 and the Universities merged in 2019. There is an inevitable lag between undertaking research and publishing it. Consequently, some of the most important publications in all of the top 30 outputs presented represent work that was undertaken before the merger of the universities. This is the case, for example, with both of the papers under the heading of infectious diseases and vaccination. This was particularly surprising, given that the self-assessment makes reference to the creation of Tampere ImmunoExcellence as a new vaccines, immunology, and impact platform.

**Quality:** Notwithstanding the context as set out above, the Unit was able to report a substantial number of important papers in high-impact journals. It was notable that many of the studies were led by researchers from Tampere.

Particularly interesting contributions included work on diabetes aetiology, building on the observation that Finland has one of the highest incidences of Type 1 diabetes in the world, with research seeking to understand the role of diet in shaping the risk of this disease. We did, however, wonder if this work was exploiting to the full the opportunities for collaborations with research teams in other areas that might be able to provide valuable insights, for example, looking at a wider range of basic sciences that might help to explain the range of possible mechanisms by which diet may exert an effect. We felt that this was not fully covered in the work presented. The Vitality90+ study is also particularly noteworthy, providing insights into the health of those aged 90 and above. Those responsible for this project should be commended for the very high participation rate that they have achieved. This is an area where Tampere has a competitive advantage. There was also some very interesting work on other aspects of ageing, including frailty. These studies are embedded in the work of the Centre of Excellence on Research on Ageing and Care, with its links to two other universities, and which represents major asset for the University.

In the presentations by staff we also learned about studies underway that will, almost certainly, lead to major contributions to knowledge. These include, again, research on ageing, as well as on screening for prostate cancer. However, there were also important contributions in a number of other areas. Many of these, for example, the use of novel tobacco products by young people and the role of trust in public messaging, demonstrated innovative thinking.



The TRANSFORM platform and ongoing work in international health offers important opportunities for policy engagement, some of which are now being exploited while others are likely to be in the future.

**Interdisciplinarity:** The self assessment by the Unit begins by noting the extremely uncertain global situation, something that has profound implications for its work, given the motivation to improve understanding of factors that affect health and well-being and inform policies to respond to them. It rightly recognises the need for versatility and multidisciplinary. However, the presence of expertise in a wide range of topic areas and of multiple disciplines (12 in this Unit) is not sufficient on its own to be able to respond effectively to the challenges that are the subject of the Unit's work. Rather, it is necessary to develop transdisciplinary working, in which the many different fields of knowledge and disciplines are working in a synergistic fashion. This is much more difficult to achieve, not least because the funding environment that all universities work in is often unsupportive.

The Unit does, however, seem to have largely surmounted this challenge. Most of the research we reviewed drew on a range of disciplines and methods and those presenting it gave a convincing account of the value of different disciplines. We were especially pleased to see a willingness to look beyond the traditional disciplines in this field, in particular political science. However it will be important that those in these new disciplines forge links with others in the same discipline working elsewhere to ensure that they remain contemporary.

**Connections:** The material presented to us covered a wide range of topics. Although not fully brought out in the presentations, it did seem that much of the work of the Unit could be seen as contributing to a better understanding of transitions from childhood to extreme old age. The Unit may wish to reflect on whether there is an advantage to be had from making more of the connections among these different projects. It was not apparent that the synergies within the Unit were fully recognised.

**Actions to consider:**

- how the Unit should present itself to the outside world, with a clear narrative that demonstrates a coherent programme of work, maximising the complementarities. This should be portrayed clearly in an upgraded web site that conveys a sense of ambition and excitement. This is likely to require a reclassification of the way that the internal organisation is presented, now based on a mix of disciplines and subject areas (such as public health or nursing science);
- taking advantage of recent and future changes in staffing, undertake a strategic review of the disciplinary mix, thinking outside the box as appropriate to identify disciplines that, traditionally, have not been represented in this field. This review should consider

whether areas currently included within the Unit, such as occupational health, should be retained;

- explore the scope for increased collaborations across the research spectrum from basic science to social policy responses.

## 2. Societal impact

*Rating: 4*

Staff spoke of strong support for ensuring that their work has a societal impact, to a greater extent than in other Units. For the first time in our visit, we heard that there is a University committee that has been working on this issue. We heard many examples of ways in which this was being achieved, including engagement with the mass media, civil society organisations and input to policy.

In the Unit's self-assessment and in our discussions, it could be seen that the approach to societal impact emphasised input to policy and guidelines, both in Finland and internationally. We heard of several excellent examples of how this had been achieved and the contributions of Unit staff are to be commended.

We also learned about some very valuable work in the area of public engagement, in particular on issues affecting older people, including engagement with civil society organisations. It was clear that this had made an important contribution to the high rate of recruitment to the Vitality90+ study.

We were told that there is a University press/ communications office and a search of the University web site identified 31 people under the heading "Communications and marketing" but it was not clear that staff engaged with them to any significant extent. However, many staff do have personal links to journalists and we heard examples of how these are used effectively.

In summary, we were impressed by the high level of commitment to societal impact. However, we felt that there would be benefits to be achieved by revisiting this issue, to ensure that there were no gaps. Thus, while some Unit staff are active on social media, we were surprised that there is not a Unit Twitter account. There is also scope for greater use of other media, including YouTube and TikTok.

### **Actions to consider:**

- Undertake a time-limited review of its activities designed to achieve societal impact. This should draw on the growing international literature on pathways to impact, recognising the increasingly diverse range of vehicles, including innovations in social media. This

review could usefully include a series of case studies with lessons learned on what worked and what did not;

- Explore with the University communications team what assistance they can provide and how best to work with them.

### 3. Unit as a research environment

*Rating: 4*

In assessing the research environment, we were looking for evidence of the extent to which it could attract and retain high quality staff and enable them to do internationally competitive research. This requires appropriate infrastructure, which for this Unit means access to computing facilities, databases, specialist expertise in a range of disciplines, well-functioning systems for career progression, and effective administrative support.

**Infrastructure:** Unlike laboratory-based areas, health sciences is less dependent on access to capital equipment. In general, we heard that staff do have access to what they need. The exception is the ability to have easy access to the wealth of health registry data that exists in Finland. This requires audited systems to enable remote access that are currently lacking. Resolving this issue would seem to be a high priority for the University to enable it to take full advantage of the expertise in this and in other Units.

**Interdisciplinarity:** As noted above, this is a particular strength. Staff represent a wide range of disciplines and expertise in subject areas. Crucially, we saw considerable evidence that the work is truly interdisciplinary, with staff embracing the opportunities that this provides. As noted above, the Unit has demonstrated that it is willing to identify non-traditional disciplines in this field, in this case political science, and bring them on board.

**Career development:** We were impressed by the support for doctoral students in this Unit, both in general research skills, such as ethics, academic writing, and thesis writing, and methodological courses on, for example, biostatistics, epidemiology, and systematic reviews. We also gained the impression that senior staff were genuinely concerned about all aspects of the welfare of students and there were very positive relationships between those at different levels in the academic hierarchy.

The situation was, however, less satisfactory with career progression for tenure track staff, who expressed a lack of clarity about what was expected of them.

We heard positive comments about the opportunities for gaining experience abroad, through a variety of schemes, although we felt that these could be better known.

**Administrative support:** In contrast with the many good things about the research environment, we also heard considerable frustration with the University administration, with similar concerns to those voiced by staff in the other Units. This seems to have become much worse since the merger, when administrative services were centralized. This would seem to be a major barrier to expanding the international presence of the University. Staff also told us that they felt that they received relatively little support when developing funding applications.

**Actions to consider:**

- Develop a costed business case for support for access to registry data and seek funding (internally or externally) to make it happen;
- Ensure that tenure track staff have a clear understanding of the expectations on them;
- Identify and disseminate opportunities for overseas visits and placements, including ERASMUS+;
- Develop systems within the Unit to provide increased support for grant preparation, including shared resources and guidance of areas that are common to many application processes.

#### **4. Potential of the Unit**

*Rating: 4*

The Unit has developed a strong critical mass of researchers in a wide range of disciplines working collaboratively. It has a particular strength in research on transitions across the life course, with work spanning the determinants of health to policy responses. However, it was not clear that the Unit has developed a coherent public narrative that does justice to what it has achieved and we feel that the Unit could be more ambitious, for example by aiming for ERC grants.

There are a few areas where the coherence with the work of the Unit is less clear, such as occupational health. There is an opportunity to review this situation as the Unit has lost a number of professors through recent retirements, with the imminent retirement of others. This also provides an opportunity to identify gaps that could be filled. However, their choices are constrained by the need to provide teaching in certain areas and by the way that Profi areas commit the Faculty to fund tenure track staff once Profi concludes.

We were struck by how those in the other Units we have reviewed have responded to the health sector reforms currently being implemented with concern about what they see as potentially disruptive or even threatening changes. However, the Unit does play a key role in the new university-level strategic initiative, the TRANSFORM research platform, which formally brings

together MET, SOC, and MAB, to understand these changes. We were, however, told that there had been little interest from clinicians in this work. We believe that this Unit could make a much greater contribution to an understanding of the opportunities posed by these reforms for those in other parts of the University, and in particular the Faculty of Medicine and Health Technology.

**Actions to consider:**

- Explore how the Unit could best develop its synergies to develop one (or more) of the most prestigious international grants, such as from the ERC;
- Explore how it can maximise the opportunities offered by TRANSFORM, in particular in increasing awareness in the Medical Faculty and University leadership to support proactive engagement with the new structures.

## III. PANEL FOR SOCIETY

### UoA1 Education

#### Summary of the UoA

The UoA “Education” is the only research intensive-unit in the Faculty of Education and Culture that also comprises the Language Centre (providing language courses for all university students) and the Tampere University Teacher Training School – a unique asset of the University-based teacher training system in Finland which, to our knowledge, does not exist in other European countries. The education Unit can be subdivided into three different thematic areas of research:

- Education in Society: focusing on societal institutional and political aspects of education with research expertise in philosophy, sociology and political sciences.
- Communities in Education: focusing on societal changes in school, higher education, and working life).
- Learning, Pedagogy and Learning Cultures: focusing on didactics, educational psychology, teacher education, multicultural education educational assessment and special education.

New research groups—game-based learning, environmental education, and continuous learning—were created following the publication of a new university strategy.

#### 1. Scientific quality

*Rating: 3.5*

The scientific quality of the ‘Top 10’ publications illustrates various strengths and characteristics of the Unit (i.e., long-term collaborations within UoA groups) but the publications are perhaps not of the highest quality in comparison to international standards. The Top 10 outputs are chosen to show breadth and for illustrative purposes, but for example, the two examples of long-term international collaboration published in high-ranking journals include Tampere researchers at mid-author position (e.g., 4th of 9 authors), suggesting a modest contribution to these identified key publications. Overall, a look at the CVs reveals that there are some excellent publications and many examples of very strong research outputs, alongside lower ranked publications that are ranked in the lower JUFO tiers.

The number of publications is slowly increasing comprising overall 261 journal articles which is about 87 journal articles per year. With 132 members of the Unit in teaching and research positions this corresponds to less than one journal article per year (0,66). This is a rather low publication record in scientific journals. On the other hand, there is a quite substantial amount of published book chapters (134) and edited and scientific books (22) showing different publication patterns in this Unit. There are no declarations in the text about the quality of the journal articles. However, the publication quality is patchy, with between 13% and 18% publications in 'top level' publication outlets, although data are only available for two years. This raises questions about the level of ambition for research publications.

Overall, the external funding has been increasing over the last three years – with the Academy of Finland supplying the highest proportion of funding. The Education Unit is not involved in any Centre of Excellence or flagship programmes within the university. Overall, the Unit received external funding with the amount of 4,18 M€ including 1,39 M€ from the Academy of Finland. This is a high success rate (since success rate for funding social sciences in Finland by AoF is 12 % in 2021). There are no ERC grants to a member of the Unit and international funding has remained low.

The Unit may wish to consider the scientific quality of publications and specific strategies designed to move publication quality to the next level in order to continue to raise the profile of the Unit. In addition, a dedicated strategy designed to increase research outputs and applications for international funding for academic staff (especially early-career and lower-ranking academics) might be appropriate. The panel noted that one of the challenges seen by the members of the Unit is the polarization between those researchers carrying heavy teaching loads and those being able to invest more time in doing research. This is a challenge in many universities, but still worth considering at a Unit level.

## **2. Scientific impact**

*Rating: 3*

There is a good trajectory of A1 (peer-reviewed articles) which showed an increase in 2019-2021. There is much methodological diversity, with advanced quantitative methods, mixed methods, and qualitative methods contributing to scientific impact. Open access publishing is the norm, with 72% publications in OA outlets. The panel wondered if there might be more focus on cross-pollination of research with other Finnish universities. Some questions were raised about the top 10 publications, i.e., the majority of top 10 publications were not journal publications, and were perhaps not making the strongest scientific impact. With regard to the

listed Journal publications the impact factors vary between 1,5 – 6.8. (the higher impact more in journal specializing on behavioural sciences).

There is some question about leadership of international partnerships. The panel strongly felt that the Unit could consider doing more to pursue additional international partnerships by building on their strong reputation and experience in educational research. There may well be an appetite for collaboration on teaching and learning topics from non-Finnish partners. Next steps for Unit might involve exploring leadership on international projects, and continuing to explore internationalization of the Unit.

### **3. Societal impact**

*Rating: 3.5*

The Unit works with a wide range of local, regional, and national stakeholders, with examples given of collaborations with the city of Tampere, and ‘other local and national organisations’ (more detail here would be helpful). The REAL research group works with the OECD PISA survey, and it is stated that they have ‘a strong impact on national and transnational education policy’. Numerous examples are given of the impact of the Unit’s research, but more details of actual change (in practice, policy) would be helpful. For example, presenting research to policy-makers is important, but is not the same as generating actual impact and change.

Probably one of the strongest societal impacts is that the research is directly brought into practice (and particularly research in didactics) in teacher education courses. This societal impact may be seen in other countries as well since there are many cooperation projects on education development with other countries in the world. However, a clearer description of these international projects is warranted. The Early childhood education group has been involved in formulating guidelines for organizers of education. The Research Group for Education, Assessment, and Learning is part of the PISA survey and has strong impact on national and European education policy.

It would be worth considering how to engender actual change in practice and policy outside of academia, i.e., how to create impact both in and outside of Finland. The Unit has a strong potential to create actual (often measurable) impact and it would be worth considering how to formalise and encourage this.



#### 4. Unit as a research environment

*Rating: 3.5*

There is a range of formats for the research groups in terms of funding and research aims. MA and PhD students are integrated into the research groups. Academy of Finland funding supports several projects, but EU funding is low.

The research environment of the Education Unit is organized by the Faculty's working group on Research and Development including 5 senior researchers, representatives of the Teacher Training School, Language Centre and the vice dean for research. This is a very good model for a science-practitioner interaction leading to strategic choices for relevant funding. This is good structure. On the downside this strategy might be a bit at the cost of pure basic research. There are 148 members of the Unit, 132 are in teaching and research positions. (14 full professors, 32 university lecturers; 38 externally funded personnel). Members of the Unit are integral part of large international networks.

There is much to praise in terms of increases in external funding. The Unit has increased Academy of Finland funding impressively over 2019-2021, and it is possible that the Unit can plan similar actions to be directed at, for example, ERC or other international funding. At times the research activities feel fragmented, but this is true in many Units in the university (and in all universities). It would be helpful to consider building a formal mechanism to foster stronger relationships between groups in order to build communalities among research groups and strengthen research activities. TRANSIT could be a useful vehicle for international collaboration and funding - the research areas covered are appealing and timely, but it is currently quite small and possibly underfunded.

#### 5. Potential of the Unit

*Rating: 4*

We see the potential for a bright future in this Unit. The future aims and development section highlights the need for reflexive planning and continued awareness of societal and environmental pressures and changes. The three thematic areas have recently been further entrenched as the future structure for the Unit, with recent review and further funding. Additional work on internationalisation is in the planning stage - this is a priority for the Unit. In addition, the Unit might consider strategic research activity with the Teacher Training School. TRANSIT could be a useful vehicle for international collaboration and funding - the research areas covered are appealing and timely, but it is currently quite small and possibly underfunded.

For the future, the Unit sees two research foci: balancing stability and change to handle diversity issues, and second enabling high-quality research. The focus here is to increase international funding.

We strongly support the Unit to aim high, to be ambitious, and to make a strong international statement in their research. Finnish education Units have earned scholarly respect; we encourage Tampere Education Faculty to aim high and to make a significant impact to global education. We also encourage the unit to support the beginning efforts fostering quantitative behavioural methods into learning environments and education processes.

## UoA2 Language Studies

### Summary of the UoA

Becoming part of the faculty of information technology, together with electrical engineering, computing sciences and communication sciences, UoA2 Language Studies has chosen for radical innovation, in line with a necessary rethinking of what Language Studies (in the broadest sense) and more in general the Humanities are contributing to the digital and technological shifts current societies are undergoing worldwide. They have the explicit and valuable ambition to change the role and scope of academic language programs in society, around the joint mission of working towards more democratic and inclusive societies without losing their more 'traditional' strengths and specificities. They are combining it with a lot of energy, enthusiasm, optimism, and openness and with the ambition to be international forerunners in the fields they are working in, among others thanks to the interdisciplinary connections with the other fields in the faculty.

Although this is a unit in transit, it is a particularly active unit, with strong momentum. It impresses in providing a clear introduction with topical and societally relevant research areas, refreshing links between multimodality of language and human sociality, innovative projects with high social relevance, making use of new methods such as deep learning, projects in digital and medical humanities, in collaboration with biologists, statisticians etc.

## 1. Scientific quality

*Rating: 4*

The unit brings together top researchers, some of whom are internationally renowned and also intervene beyond the strictly academic sphere. It integrates young researchers well into collective work, they are active in organizing events. The unit's scientific production is abundant and of excellent quality (18 % of the publications in the highest category, JUFO3, whereas the peer units in Finland vary between 8,6 and 14,2 %). Bibliometric data show a significant increase of peer-reviewed publications between 2019 and 2020, a doubling of publications of the highest level in JUFO and a significant increase of the leading level too. UoA2 combines personal publications, which traditionally prevail in the field of humanities, and co-authored publications. The Unit's strong production of edited books, journal articles and book chapters shows its ability to federate, gather and stimulate research in the national and international context – even if in international co-authoring, the unit recognizes that it still has space for improvement.

During the assessment period, the unit benefited from many national grants and research funds (Academy of Finland, foundations like Emil Aaltonen Foundation or Kone Foundation) and the share of private funding increased sharply in 2021, as did public international funding, albeit in smaller proportions. However, the panel suggests to be more ambitious in terms of applications for wider, more prestigious European or international projects with a high rate of financing such as ERC or Horizon Europe projects.

From the Open Access perspective, the Unit remains at a good level (56% in 2019, 55% in 2020) for peer-reviewed publications; the number of the other publications has increased.

## 2. Scientific impact

*Rating: 4*

The Unit attracts wide interest in research communities in different languages, regions, and disciplinary fields, as indicated by editorial activities with leading publishers, evaluation and expertise activities in high-level international journals. The involvement of members in expert missions is attested by many examples. Awards, honours, responsibilities in scientific academies, societies, and networks, invited fellowships, are other indicators of international recognition. The panel suggests the unit would use opportunities to enlarge via international collaboration and to attract a more diverse project portfolio.

### **3. Societal impact**

*Rating: 4.5*

The unit is “one of the few sites in Finland that undertakes [...] solution-oriented language research especially in terms of applicability of science; this signifies another change in understanding the role and scope of academic language programmes in society”: this is extremely interesting and impactful. The unit shows in a convincing way that “language programmes have a major role in aiding multicultural education, intercultural understanding, and international engagement in society, as well as in teaching critical and analytical skills”. This is really trendsetting in the Humanities. The unit also gives convincing examples of service to society and outreach, more than for impact but in international context this is still (far) above average.

The unit’s most significant societal impact comes from providing research-based, societally engaged language education for future language teachers, language and culture professionals, and experts in multilingual communication. Its members collaborate with institutions such as the Finnish Education Evaluation Centre or the Finnish Matriculation Examination Board, but also companies and professional and advocacy organizations. They organize training for EU translators and quality officers, they combine language and translation studies with accessibility and usability studies for the benefit of special populations (dementia patients, sensory disabled people, immigrants...), they offer a theory course with researchers of architecture and the urban environment as well as practitioners of art, both Finland-based and foreign. They have also invited indigenous artists for public performances, increasing public understanding of minority cultures. The organization of conferences in contact with geopolitical and sociocultural issues, or the participation in media interviews (e.g. about social, cultural, and language practices in Ukraine and Russia), attests to the unit’s involvement in societal debates and to its openness to contemporary cultural issues.

### **4. Unit as a research environment**

*Rating: 4.5*

The Unit is undergoing a generational change, as the professoriate will be almost completely replaced within a five-year period. The UTA RAE 2014 encouraged the unit to recruit outside the university and internationally; this has been implemented with 5 recently hired professors who are either not Tampere graduates or come from outside Finland. The new professors are hired as Tenure Track positions, which is a new system, decided by the university management. The unit tries to divide the teaching load in a fair and transparent way between TT and lecturers but cannot avoid some tensions on this topic. Not all lecturers are said to be equally keen on

doing research, but research is what people are being measured for. Some members hope for a career path for teachers, but it is not clear how that would then match with research based teaching. In any case, the panel suggests to continue to work towards fair and transparent division of teaching load and to set clear expectations in terms of the different profiles. It would also be beneficial that the university develops a university-wide system, including financial support for replacement, for sabbaticals. The panel also suggests to secure positions for PhDs and postdocs through a diversification of the project portfolio (cf. supra).

The unit's research and research groups are gathered under the research centre Plural, which has a key role in organizing scientific events, targeting junior researchers in particular, and which aims at creating more internal cohesion within and critical mass for the Unit's research, facts underlined in the UTA RAE 2014. Plural is a genuine place where people can come and collaborate, having regular writing sessions, writing retreats e.g. It also has a blog online and is active on social media.

The unit has a well-working doctoral program with a multidisciplinary seminar and a summer school. They also organize a seminar for PhD students every two weeks, where they can present their research to each other, which has meant a lot in terms of community building. The unit has regular discussions about who they are training and for what they are training them, screening PhD students' motivations and expectations in terms of career possibilities even before they start the PhD. This is especially useful in fields such as Literary Studies where there is a lack of university positions.

In terms of support for project applications, the unit refers to collegial support from Plural, but recognizes that developing more systematicity at this level is definitely one of the challenges for acquiring international projects. Apart from that, the unit appreciates receiving a lot of support from the university: leadership training, university-wide researcher schools where one can meet researchers from other disciplines etc. Especially support for ambitious project applications (MSCA, ERC) is well-developed, but perhaps not enough known by everyone. Overall, the panel suggests to develop more systematic support for project applications, in collaboration with the university-wide support and making sure that all information reaches the right persons.

The unit has a good infrastructure for research and teaching, with a language technology lab, an interpreting studio, a language studio, as well as a phonetics lab, which is currently being integrated with other faculty infrastructure for researching voice and sound.

The unit's Self-Assessment Report regrets the few salaried positions available for PhD and post-doctoral researchers, and the lack of sabbaticals for all.

## 5. Potential of the unit

*Rating: 4.5*

This is a unit that has the potential to be a driver in setting the international agenda for Language Studies (as they understand it) in a genuinely interdisciplinary and transdisciplinary way through bold and innovative collaboration with electric engineering, computer sciences and communication sciences without losing sight of more ‘traditional’ disciplinary research carried out in the disciplines, e.g. research on syntax in linguistics, didactic research. They have the potential to do so on an equal basis with their partners, all learning from each other and progressing together, while better understanding and invigorating themselves. They recognize it as a difficult but very rewarding ambition. The panel suggests to continue the implementation of the set ambitions. As the unit recognized itself, this will need further shifting their perspective towards (interdisciplinary) research, as “the teaching is still in our heads”.

They also have the potential to change the role and scope of academic language programs in society. In this respect, it would be beneficial to further reflect about the distribution of literary scholars between units 2 and 8, which this unit recognized as an oddity, and to reflect at least about ways to increase collaborations between the two.

The unit has certainly the potential to take the next steps in internationalization in terms of publishing, of project funding (ERC and collaborative EU projects), allowing them to turn their success in national funding into a broader, prestigious international project portfolio and to secure better positions for their PhD students.

The panel also sees potential in furthering their publication strategy in terms of promoting open access publications and multilingual publishing so as to strengthen the unit’s socially relevant, ethically committed, and technologically advanced research.

## UoA3 Information and Knowledge Management

### Summary of the UoA

Now called NOVI, this unit was established in 2001 and is described as a 'solution-seeking unit with scientific impact'. NOVI is a young unit with a lot of potential, with 8 professors (steady growth over the last 15 years) and about 40 other staff members. In comparison with other units, there are relatively few people working on resource agreements. The unit reports a very strong graduate employment record. NOVI offers three research areas with broad interdisciplinary portfolio: knowledge management, management of information systems, and management of digital businesses. The unit offers a clearly applied focus, and a wide range of disciplinary backgrounds. About half of their PhD students are part-time, and working in industry. This combination between doing a PhD and having a professional career creates challenges for progress and support. Other recent challenges reported by the unit include recent rapid growth and the challenges inherent in publishing in scientific journals simultaneous with preparing the project reports demanded by industry. Overall the unit has very strong relationships with industry and government ministries where NOVI's expertise is clearly respected and sought after.

### 1. Scientific quality

*Rating: 2*

The unit has an explicitly applied focus: the opening statement of the self-assessment highlights impact rather than scientific quality. There is a strong emphasis on co-production of research designed to solve industry problems, and there is a strong demand for the work of this unit. The top 10 publications are mostly quite applied, using a range of methods, with a few review articles and some empirical work. There is a very small proportion in JUFO 3 categories in their publication statistics (i.e., 1/36 in 2019; 4/61 in 2020), and there is a relatively high proportion of JUFO 1 category outputs.

The panel posed questions about the choice of publication outlets and the actions taken to increase quality. The unit described the tensions between preparing reports for contracted research from industry and the challenges of simultaneously addressing rigorous scholarly questions demanded by the highest-quality journals. The panel raised questions about leading the field vs. reacting to the field and how this compact but potentially strong unit could take steps to deliver scholarly impact at an international level.

The panel believes that the unit has the potential to lead the field in generating new ideas and paradigms. Additional attention to increasing visibility in international research communities would be appropriate. In addition, there are opportunities to connect more closely with social sciences and humanities researchers in the University in order to strengthen critical, theoretical and ethical, aspects of future projects.

## **2. Scientific impact**

*Rating: 2*

The unit reports a wide range of activities in scholarly organisations and active engagement in terms of reviewing research, contributing to scholarly activities, and organising academic conferences. There is considerable international activity, with a range of examples of multidisciplinary research projects. The unit is clearly involved with scholarly partners from around the world.

The unit noted that a focus on research-specific issues 'poses a risk that it takes them far from the practice and their relevant problems'. The panel wondered if this stance posed too big a divide between fundamental and applied research, and urged the unit to consider long-term scientific impact that perhaps must be built outside of the applied research paradigm. The unit may wish to consider longer-term scientific impact through building strong theoretical and empirical research foundations that can lead the applied research. A next-level step for the unit might be to access University support for building long-term international funding and projects through which they might contribute to the wider scholarly discourse through the highest-quality research.

## **3. Societal impact**

*Rating: 4*

Societal impact is where NOVI shines, with a large proportion of funding coming from applied funders (Business Finland), and a 'practitioner orientation' meaning that there are numerous examples of university-industry-public sector collaborations, especially the ECO3 project. Good examples of projects with societal impact (but sometimes mixing up with scientific impact), MBA programs, PhD students working in companies, MA theses in collaboration with industry.

The panel was impressed by three recently completed projects (e.g., ENACT), but queried how new projects in the pipeline would show significant research and social impact. The panel wondered if there were mechanisms in place to sustain the societal impact, and indeed, to 'raise the bar' in terms of applied research with the addition of a more thoughtful, theory-driven



approach to collaborations with industry. The panel acknowledges the challenges of responding to the needs of industry and balancing these responses with scholarly impact. Careful consideration of the balance between reacting/responding to industrial requests and building outstanding research may be useful. The panel also wondered about consideration of creating societal impact through spin-out companies or licensing expertise (i.e., thus creating space for scientific impact).

#### **4. Unit as a research environment**

*Rating: 3*

There is a relatively high proportion of international researchers. A recent decline in doctoral degrees awarded (from 5 to 1, 2019 to 2021) may be covid-related? Funding shows an upward trajectory, with a good range of funders; with applied funders (Business Finland) especially strong, but with some previous Academy of Finland and EU funders represented. There are numerous examples of staff exchanges around the world. The TRANSFORM platform and STUE community are good initiatives. The unit reported a high-quality list of active staff exchanges. The panel considered how rapid growth may have influenced the coherence of the unit, with a somewhat disjointed overall approach to the research strategy. The panel queried how the unit might develop a clear research strategy that addressed both scholarly rigour and the applied work that is currently the focus.

Many of the PhDs in the unit are working in companies and doing PhDs part-time. The unit appears to focus on preparing PhDs to work in industry rather than contributing to scholarly debate. This is fine, but a balance between scientific rigour and more reactive applied research needs to be considered for the sake of building an internationally impactful research environment. There was good evidence of collegiality, and members of the unit noted: it feels like a unit -when we need help from each other it feels coherent... collegial; very focused on research culture.

The panel noted some discussion of interdisciplinary links within the University: these links might be expanded and planned more strategically. There is considerable diversity within the unit which can be a strength; an overarching coherent plan to continue to build the research environment within the unit would be an asset.

## 5. Potential of the unit

*Rating: 3*

The panel feels that the description of actual strengths is convincing but perhaps too much oriented toward the situation “as is”; where are the important evolutions in the international scientific field that the unit wants to codetermine? The panel suggests further work towards a critical intellectual agenda that would drive the interactions with industry and that would steer the international research ambitions so as to keep the right balance between being reactive to industry needs and setting a joint research agenda for the unit. The panel was impressed with certain aspects of the current work but wondered about the overall scholarly ambition of the unit in terms of contributing to leading the field(s) of relevance in the unit.

The unit has recently undertaken a reflexive exercise that highlights the strengths of the unit, including motivated staff, high demand from industry, and good long-term strategic connections within and outside the university. Questions from the strategic exercise included: how to integrate new academics into the existing structures, how to maintain the ‘internal coherence’ of existing research, and how to develop new synergies within and outside of academia. The action plan continues the emphasis on practical relevance and high societal impact. The panel applauds the unit’s desire within the unit to build larger projects including large EU projects. A continuing discussion of the strategic balance between theory, research, and practice will be of continuing importance for this unit, especially as they bring in new academic staff and students.

## UoA4 Welfare Sciences

### Summary of the UoA4

UoA4 Welfare Sciences (WELS) consists of three subdivisions: (1) Logopaedics and Vocology, (2) Psychology, and (3) Social Work which together form a Unit as part of the Faculty of Social Sciences. The delivery of professional education courses is a core activity of this unit for all three disciplines and the relationship between teaching and research is recognized and embedded.

The Unit currently consists of 100 employees (84 persons calculated on census day 1 Oct. 2021) and is self-described as research-focused with research activities occurring at each staffing level. The Unit has been successful in competitive research awards, recently securing a further three Academy of Finland awards and generally comparing very well to comparators

within the national context. Five doctoral degrees were awarded to WELS research students in 2021.

The panel had the opportunity to meet three groups of researchers; firstly, a group of senior Faculty staff, secondly, a group of junior researchers and finally, a group of senior researchers. The three disciplinary sub-divisions named above were represented in each of these groups. These interactions provided the panel with the opportunity to ascertain the depth and breadth of this Unit's research activity. From the presentations and discussions, as well as the self-assessment documents reviewed before the visit, the panel notes the wide range of research topics actively under investigation and the utilization of various methodologies within this Unit. The bulk of the research conducted by WELS aligns with two core areas of the current TAU Strategy, namely 'society' and 'health'.

In particular, the Unit has identified key research topics for each main discipline as follows:

**Social Work:**

- (1) children, young people, families and child protection
- (2) adults, mental health, addiction and homelessness
- (3) older adults, ageing and support needs

**Psychology:**

- (1) social cognition and emotion
- (2) work, environment and well being
- (3) health (including mental health) and neuropsychology

**Logopaedics/Vocology:**

- (1) study of speech language and voice
- (2) rehabilitation of swallowing disorders
- (3) rehabilitation of speech disorders and voice problems

## 1. Scientific quality

*Rating: 3.5*

The quality of scientific work produced by this Unit is reflected in its continued success in securing external funding, as well as by its strong publication output including in high level journals.

The self-assessment document conveyed the Unit's competitive strength in securing research funding awards and further bid successes were reported to the panel during the live visit.

Overall, the panel counted 18 funded projects in the self-assessment report but were informed

during the visit that further funding has been secured under three bids from the Academy of Finland. More than 80% of funding is secured from the Academy of Finland, while successful bidding for EU funding is lower in comparison. Apart from funding from AoF, some research projects are funded by other foundations, for example, 1 project was funded by the social insurance institution of Finland and 2 projects funded by the EU.

Nationally, WELS is a forerunner for the first ever national funding programme supporting social work research. A total of €2.4M funding was distributed under this programme in 2021 and 30% of this fund was allocated to WELS (distributed across five projects).

The number of publications from this Unit averages 146 publications per year produced by 84 staff members. This equates to 1.7 publications per member per year. The trajectory of publication output and quality is moving in a positive direction with the average 2021 output corresponding to 1.8/faculty member. Within these figures, the share of peer reviewed publications is high (85%) and 40% of these publications correspond to the JUFO 2 or 3 classification. In the region of 68% of all publications in 2020 were open access publications with this figure rising in 2021 to 81.3%. The main focus of the papers is research in applied science followed by publications on theoretical areas. There are few publications in the highest impact Journals in this area of research (e.g., APA-journals in case of psychology). The self-selected top 10 publications are from all subunits and the impact factors of the selected Journal articles vary from 7.4 – 1.6 There is one book publication in the top 10 list.

Even though very few faculty members are non-Finnish, about 40% of publications were co-authored with at least one non-Finnish scholar.

## 2. Scientific impact

*Rating: 3.5*

In reviewing this measure, the panel noted the Unit's record in high-ranking publications (detailed in the previous section) as well as the relationship between the Unit's research outputs and the relevant disciplinary fields.

The documentation provided to the panel indicates that the overall citation impact – weighted for the field – is 1.25, which means that the number of citations is 25 % higher than the average of the field. As noted in the previous section, 40% of articles were accepted for publication in journals located in JUFO categories (2 and 3).

There are some areas that display higher impact measures. These include research on postpartum depression, psychological capital and work engagement, and finally greenspace-green infrastructure, the later housed in the psychology subunit as a rather unique research

area in psychology. Seven out of 15 full professors have an h-index of >45. 81,3 % of the publications are open access. 76 % of all scientific publications (refereed Journals and book chapters) are English language publications and are, therefore, accessible to the international scientific community. Therefore, proficiency in scientific impact is repeatedly demonstrated by this Unit across a range of metrics.

WELS publications are, according to the self-assessment report, frequently cited and have been influential regarding developments in the relevant professional fields as well as contributing to “renewing the field”.

Internationally, in respective research fields, WELS is respected for its contribution to knowledge production in the three relevant disciplinary fields and this positions the Unit as an activator of evidence-based, high-quality standards of practice. The psychology subunit (according to impact factors of publications) is here at the forefront. However, aiming to increase publications in APA journals might support stronger international visibility. Recognition of the scientific impact and reach of the Unit’s research expertise is reflected in its success in attracting a cohort of international junior researchers, some of whom confirmed to the panel that they applied for positions in WELS based on their prior knowledge of its work and reputation.

The Unit currently provides supervision to 82 junior researchers (PhD students) and accommodates high numbers of post-doctoral research staff.

As further evidence of their international standing, WELS staff are asked to serve as reviewers for articles submitted to prestigious Journals and also serve on international committees and review boards. The Finnish Society of Social Work Research was during the assessment period chaired by a WELS professor, and The Finnish Psychological Association was vice-chaired by a WELS faculty staff member.

### **3. Societal impact**

*Rating: 4*

The research output of this Unit has reach and impact across a wide societal landscape. The Review Team noted examples of impactful research projects across local, clinical and societal contexts and in discussions with the Unit staff the Review Team members learned about exciting forthcoming new projects, such as the forthcoming largescale project on youth solidarity, which will make important societal contributions.

The Review Team concur with the self-assessment report, in which the Unit’s societal impact was described as deriving from “rigorous research, research based teaching and by engaging with professional practice”. Research findings from WELS are typically translated into evidence-

based practices, best practice guidelines etc. and contribute to service developments for the benefit of the wider society. The neuropsychological outpatient clinic operated by Unit staff is an excellent example of the translation of scientific outputs into applied contexts. Other locally based examples involve collaborations with municipal authorities, hospitals, and NGOs that can assimilate results into their respective practices. As was pointed out during the visit, the unit is also very active in practical speech and vocal rehabilitation.

#### **4. Unit as a research environment**

*Rating: 2.5*

The WELS unit comprises 15 professors (9 full professors, 4 tenure track associate professors, 1 emerita and 1 half-time professor), 17 senior lecturers, 15 junior instructors, 11 post-doc fellows, 4 senior researchers and 20 junior researchers (mostly doctorates) and 2 clinical psychologists (overall 84 persons). All four faculty career phases are well represented (1: 27%, 2: 30%, 3: 30%, 4: 13%). In addition to the 20 junior researchers, the professors of the department are supervising substantially more doctoral students (overall: 82). There were 17 doctoral degrees in 2019-2021 which is quite substantial for the personnel available. The WELS hosts one psychophysiological laboratory (research on social cognition) and a speech and voice research laboratory (speech production, acoustics and perception). There are some possibilities to strengthen the psychology subunit, since psychology is a strongly growing discipline across Europe and the world. In this respect it would definitely be helpful to think of a professorship position in social psychology that is taken by trained psychologist (we have seen that social psychology is quite extensively present in UoA10 but is represented by a social scientists). By recruiting a social psychologist who would also be working in the area of organizational psychology a new very attractive avenue for applied psychology could be opened. In addition, by strengthening the intervention part, clinical psychology would profit from a professorship position focusing on behavioural interventions in the mental health area. Finally talking to a PhD student in this field it became clear that strengthening the area of behavioural neuroscience would increase the attractiveness of the research environment.

Research activity within WELS appears to be operating in disciplinary silos with meagre cross-fertilization across disciplinary boundaries. The panel noted the lack of opportunities provided within WELS to support cross-disciplinary research, knowledge sharing/exchange or cross-silo research activities. It is accepted by the panel that the numbers of personnel make it difficult to organize Unit-wide knowledge exchange events on a regular basis, but there is capacity to organize smaller, more targeted events such as seminars, colloquia, etc. for specific target groups such as the junior researcher cohort.

The panel explored teaching-research balance in workloads with staff. While they found that research is a valued element of this Unit, it is clear that administrative and teaching demands curtail the extent to which staff can initiate or participate in research work. There is a concern that teaching/administrative loading could dampen enthusiasm for aiming for largescale, high-end research projects.

## 5. Potential of the unit

*Rating: 4*

This Unit demonstrated significant potential for further development of its research agenda and activity level. It was clear to the panel that within this Unit there are high levels of research competency, a wide range of experience and momentum behind its research mandate. Research work is valued within this Unit and the Review Team encountered an appetite within this Unit for further development of an already high level of research performance. The ability of the Unit to successfully compete for research funding was evidenced time and again. This Unit has capacity to attract more EU funding beyond its current awards but will need mechanisms which allow such ambitions to be pursued without over burdening the key staff members.

The Unit brings together a set of disciplines which are not usually partnered within academic units, but this creates opportunities for new synergies and research opportunities (see suggestions recommended above).

The panel congratulates WELS on its research achievements and its continuing success in securing competitive research funding.

The rich expertise and research proficiency within WELS could be harnessed more deliberately with a view to strengthening core research competencies, and building opportunities for innovative and ground breaking cross-disciplinary research projects, some of which could include cross-disciplinary collaborations.

The disciplinary architecture of WELS provides an interesting opportunity for research innovation and novel collaborations. In the context of commendable research achievements and prowess on the part of WELS, the panel would encourage a greater focus on capitalizing on the cross-disciplinary opportunities for knowledge and skills exchange which the triptych structure of the WELS Unit enables [word “enables” added by the TAU RAE 2022 secretariat]. The establishment of a high-level committee dedicated to fostering momentum for dynamic research knowledge exchange and cross-silo research activity is recommended. At the same time, there is a danger of over-focusing on homogenization, as academic freedom is important in a unit of this size. The panel regard the diversity of research practices within the one Unit as a potential

strength, and the combination of disciplines as potentially offering opportunities for unique group research configurations. We also see large potentials within psychology if new professorship positions (as highlighted above) would be opened to stronger correspond to the structure of this discipline according to international standards.

The infrastructure supporting research activity in this Unit is important and it is vital that research momentum is not constrained by lack of research supports, be they technical, administrative or allocation of sufficient time.

It is vital that research activities are supported by access to relevant technical and administrative support as and when needed.

This Unit has significant potential to become a top ranking global research unit but will need strategic support from the university to ensure that staff are well supported to achieve their best.

## UoA5 Business Studies

### Summary of the UoA

The unit of Business Studies at Tampere University includes 67 members (research active) of which 22 work on a resource agreement. The degree programs of the unit are very popular with students, so the unit is quite teaching-intensive and all members of the research and teaching staff have "significant teaching responsibilities" (p. 1 of the self-assessment). The MAB faculty is responsible for 25% of all Tampere University degrees with only 10% of the personnel, and the Business Studies Unit produces approximately 30% of the degrees of the faculty with about 20% of personnel.

The unit is organized around the theme "reconfiguring the potential of business and economics for societal well-being" into ten research groups. The size of the research groups varies and ranges from a maximum of 18 to a minimum of 6. Interestingly, the research groups with a more explicit focus on societal well-being and sustainability are the smallest and not the largest. Counting the research groups membership leads to 119, indicating that many are associated with more than one group. Only 29 CVs were included in the material.



## 1. Scientific quality

*Rating: 3*

The unit appears to be a pioneer in corporate sustainability disclosures, sustainability accounting in social enterprises, and using food retailers' vast-scale customer loyalty card data for enhanced societal value creation.

In the self-assessment only three names appear. Of the ten selected pieces only three are on the ABS 4 level, which is fairly low. The Top-10 publications were chosen to show the approach of the unit to "publish research in high-quality journals and books" (page 1 of the top 10 publications document). It is therefore even more surprising to find one JUF01 publication listed in there. Many of the listed reports seem interesting and address important issues and journal publication is not always a reliable indicator of quality, but the impression is a shortage of top-level research. The panel suggests the unit make efforts to increase the quantity and especially the quality of the publications with special focus on ABS4 publications.

There has been an increase in the number of A1 publications (from 36 to 49) in the period assessed. However, for a total of 67 research active staff, these are still quite low numbers. The proportion of A1 publications in comparison to other types is favourable. The unit raised 3.3Mil€ external funding in 3 years; there is some EU funding, but still quite low (175k€)

The unit includes one Centre of Excellence recognized by the Academy of Finland (6% success rate): Centre of Excellence (CoE) in Tax Systems Research with 4.9Mil€ for 5 years

The unit does much teaching, so perhaps this explains the relatively low top-level research output. In this respect, the panel suggests the unit reconsiders the balance between teaching and research, without sacrificing the quality of teaching, perhaps by increasing the teaching focus of non-research active or successful staff and giving more research time for highly skilled researchers.

## 2. Scientific impact

*Rating: 3.5*

The panel suggests the unit to work towards higher scientific impact in terms of citations (or some other specific indicator on impact), while still maintaining a broad view on this and avoid gaming, e.g. through multiple authorship.

The research groups in marketing (Customer-Oriented Marketing and Wastebusters) have increased their annual number of citations from 606 (2019) to 1,041 (2021). Given the 17 and 6

members in the respective groups, this seems quite low. It is unclear who exactly is included in the two groups, which, presumably, partially overlap.

There are a number of editorial board memberships, but not many in highly ranked journals. Two international collaborations are mentioned as examples.

There are some interesting ideas and projects. The unit addresses some more vital areas that are not so common to do research on in business studies, e.g. food waste.

There are some expressed clear ambitions: Moving beyond the existing boundaries of the field and conducting pioneering work, of trying to being at the forefront.

The Insurance and Risk Management Research Group is the only research group among Finnish universities that specifically teach and study topics related to multi-method analysis of insurance, pensions, and risk management from the legal, business, and social perspectives

The rate of international collaboration has gone up somewhat, but it is still quite low, showing a low level of internationalization. It would be good to develop strategies for internationalization.

Funding has also decreased in the three-year period from around 1.5million€ in 2019 to around 800.000€ in both 2020 and 2021 (although in 2021 there is a higher percentage of international funding than 2020). The panel suggests the unit to increase project applications so as to secure research funding.

### **3. Societal impact**

*Rating: 4*

According to the self-assessment report the unit 'considers business as a means to enhance societal well-being and aims at reconfiguring the potential of business and economics for societal well-being.' This is ambitious and covers broad ground, but of course also quite vague and apart from examples it is not clear how this will be accomplished. The panel therefore suggests to concretize actions for reconfiguring the potential of business and economics for societal well-being.

The unit presents a good definition of impact, but it is not clear how it relates to fundamental research and if it distinguished from outreach (e.g. membership in BoD or interaction is not impact). The panel suggests to make the distinction between impact and outreach clear.

There are somewhat unclear implications for health, well-being, environment, society at large: which ones precisely? A key issue to address is contradictions and conflicts: different principles

and ambitions for well-being and sustainability do not always go hand in hand. The panel suggests to address these contradictions and conflicts.

According to self-assessment 'The book published by Routledge (JUFO 3) on sustainability accounting and accountability (Laine et al., 2022) represents a cornerstone of current scholarship in that field. Similarly, the book on food waste management (Närvänen et al., 2020), published by Palgrave Macmillan (JUFO 3), has received wide attention among scholars and practitioners and has been downloaded over 84,000 times since its publication.' This is positive and indicates an ability to reach out.

The self-assessment reports examples of national and local societal impact and interaction. Generally the unit addresses many timely topics, including much work on sustainability. The unit seems to have more focus on societal impact than many other business units in universities. There is always a risk that a topic that is deemed timely and important – and fashionable – may get over attention and easy research money. It does not necessarily always mean a good research topic in terms of high quality research with a theoretical contribution.

There are initiatives to collaborate with local and national stakeholders (including Ministries) and this is definitely a plus. However, having "societal well-being" as their pivotal interest in the unit, one expects these activities to be intensified in the future.

#### **4. Unit as a research environment**

*Rating: 3.5*

There are ten research groups, with 6-18 members. They range from very broad themes or rather an entire discipline – 'economics' – to much more specialized and, one may assume, focused groups like Wastebusters Research Group (6 members). Many groups seem to be interested in sustainability issues: Responsible Management Research Group, Sustainability and Critical Accounting Research Group and the Wastebusters Research Group. There may be some overemphasis on this: there are of course other important themes that may get less attention.

The economics group was awarded the Centre of Excellence (CoE) in Tax Systems Research by the Academy of Finland, from 2022.

The impression is that people in an early stage of the careers are more on the research front than more senior members.

During the assessment period (2019– 2021), the amount of external funding was €3.3M. This means about 50 000/unit member. It could be interesting to compare this with similar units in Finland and perhaps the Nordic countries. It is considerably lower than the administrative unit.

There is a significant generational change during the past five years

The percentage of non-Finnish faculty is very low. Whether this reflects problems recruiting international faculty or a large surplus of good Finnish academics in combination with teaching needs is hard to say. Efforts to make sure meritocratic recruitment may be motivated by not only research considerations, but also teaching requirements (including the ability to use Finnish language) is part of the equation. The panel in any case suggests to consider actions to increase internationalization of unit and personnel.

One of the main issues in UoA5 seems to be the amount of teaching required by its staff, which could affect their performance in other areas and make it a difficult research environment. This is clearly stated in the self-assessment (page 9) when it says that there has been a "significant increase in teaching" with no increase in the number of staff actually employed by the University (the increase was only due to staff on temporary contracts or "resource agreements"). The unit seems to be going also through a generational change, which, on one side, might mean less senior leadership (fewer large grants and top publications), while, on the other, might mean a rather young and vibrant environment with possible good peer-effects. In this respect, the panel suggest to reconsider the balance between teaching and research without lowering the teaching quality.

## 5. Potential of the unit

*Rating: 4*

Societal commitment and high teaching load are laudable but together may create problems for the production of high-quality research. The unit is struggling a bit with this. According to the self-assessment report the ambition is to 'allowing more time to be allocated to research (especially for the most talented and productive researchers) and 'Ensuring teaching-free periods for researchers through better teaching coordination'.

Making some extra efforts to attract international staff and strengthening the unit's international research activities may be a good idea. This may call for some long-term work in building international relations and having networks. There is a risk that 'international' may not include the best scholars. It should not just be a matter of demonstrating a positive development in terms of numbers or quotas.

It is probably wise to work with differentiation in terms of research time. While an ideal may be that all or most should do both teaching and research, it may be better not to force or encourage all to do research and allocate resources to those not seriously interested and talented.

The self-assessment lists five research development priorities based on an internal evaluation: read more as an action plan than as long-term ambitions.

Positive is a stress on innovative and impactful multidisciplinary research initiatives with high potential for external funding, on increasing application activity, on increasing collaborations, on increasing share of international staff, on societal challenges and wicked problems. It is also positive that the unit deviates from mainstream business schools and exhibit a more original, critical and distinct profile than is common.

## UoA6 Administrative Studies

### Summary of the UoA

The Unit of Administrative Studies (UoA6) employs 25 permanent staff and more than double that number in non-permanent posts. They work in six different disciplines in 8 research groups. More than half of its work is externally funded. Its work focuses on public administration in areas such as urban experimentation; sustainable transformation; governance challenges.

The self-assessment indicates that its students span undergraduate, postgraduate and doctoral levels with 10 doctoral students graduating last year. Two PhD programmes are noted indicating an intensity of academic output at the doctoral level.

### 1. Scientific quality

*Rating: 3.5*

The unit sees itself as the largest unit in the field of administrative sciences in Finland and claims to be one of the leading units in Northern Europe. Its quality shows in that it has co-hosted the AoF Centre of Excellence in Relational and Territorial Politics of Bordering, Identities and Transnationalisation (RELATE) and participated in the Nordic Centre of Excellence in Safety and Security Studies. In 2019–2022, the unit has been successful in receiving Academy of Finland funded individual grants for six postdoctoral researchers and two senior research fellows. The unit is successful in getting research grants. However, the unit has the capacity to raise its funding ambitions beyond the Nordic scene.

The research shows novelty and originality in several fields and many of the research groups publish research in prestigious international outlets. The panel is of the opinion, however, that the work in the different groups could be better coordinated to ensure that they contribute to raising the quality of each other. Some groups, for instance law, seem to focus on topics that are not the most central to the study of public administration.

The panel is of the impression that quality varies over the research groups, where some groups perform excellently. One point to note is the lack of attention to the EU-dimensions in Finnish public administration. The research conducted at the unit has high scientific ambitions, and the group seems to manage the combination of international scientific relevance and local impact.

## **2. Scientific impact**

*Rating: 3.5*

The impact of the work of this Unit includes its presence in refereed journals, as well as book publications and conference participation. The unit has put much emphasis on international publishing, but seems to have more quantitative than qualitative goals. A total of 85% of the peer-reviewed publications are published in English, and around 1/3 of all peer-reviewed publications at UoA6 are international peer-reviewed co-authored publications (publication types A and C); however, not many are in the highest quality journals.

This unit is actively networking with international research colleagues and groups. Interdisciplinarity and internationality are hallmarks of the research outlook adopted in this Unit.

A brief overview of Google scholar citations reveals good but not overwhelming high scores. Most professors appear to be between 1000 and 4000 Google citations. (Numbers seem relevant, i.e. not coming mainly from textbooks or multiple authorship papers.)

There are references to agenda-setting monographs, and also to edited volumes. Generally, these are not always of consistently high quality.

Many of the faculty have active roles as editors, associate editors and guest editors of special issues in international journals, although not necessarily in leading outlets.

The research of the Unit attracts attention in the academic community. It provides useful knowledge and is influential in its specialties.

### 3. Societal impact

*Rating: 4*

The key stakeholder for all RGs is Finnish public administration (broadly understood). Thus, for the unit 'society' generally means 'Finnish administration, public management, and public at large'.

Ministries and other public agencies often fund the research of the unit. In the area of societal interaction, the unit contributes to networks of partners and collaborative arrangements that focus on public sector reforms, public finances, regional development, environmental politics, human rights and higher education policy and sustainability.

Faculty members work in expert positions for the World Bank, European Union and European Council. During the assessment period, faculty members worked as appointed members of governmental committees focused on regional tax, future local government, social and health care reform, analysis of the COVID-19 pandemic measures and policy development. Public law scholars are active experts for the Constitutional Law Committee, and are active in vocational training. It is unclear how this body of individual work of the researchers is reflected in the research of the research groups.

Societal impact could perhaps be increased by cooperating with other units within the faculty and in other faculties.

The research of the Unit is excellent in terms of reach and significance. The research is useful and it has influence on the society at large.

### 4. Unit as a research environment

*Rating: 4*

The unit is a large grouping in terms of administrative studies in Finland and its activities are varied and diverse. There is a focus on doctoral student education which is important in terms of the future vibrancy of this field of research in the institution. The need to consolidate the staffing allocation and to recruit additional posts is flagged in the self-report and is supported by the panel. A recent survey among staff indicates a desire for more targeted and increased resources.

The research environment of the Unit is good in terms of infrastructure, personnel structure and research funding. The Unit makes good use of national and international collaboration, mobility, networking, and recruiting. Physically, the unit is located over two separate floors. This seems to inhibit, to a certain extent, the exchange between the research groups.

Within the unit, employed PhD students are affiliated with RGs, and PhD education is organised as research seminars under specialisation options or as part of RG activities. In 2019–2021, 28 doctoral students graduated from UoA, and of these, three were international. There were 1–12 graduates affiliated with each research group. Currently, the unit supervises 79 active PhD students.

The unit has a high level of international exchange with many incoming international scholars. The unit could engage in deeper reflection on how this could benefit their groups and the unit as such.

To some extent, the unit seems to struggle with its identity, although several reported that the organization as a unit had helped increase their visibility. However, a pluralistic unit, capable of attracting research grants, publishing extensively and producing many PhD studies may need less of a shared identity.

## 5. Potential of the unit

*Rating: 4*

As mentioned above, the unit seems to struggle with its identity, although the seriousness of this as a problem can be discussed. There seems to be little concern about how the unit can function as a unit, and there seems to be a lack of reflection on the future. There is a certain mismatch between the way the unit evaluates itself and the underlying realities. The unit states its aim to become:

- a globally recognised leader in the study of place leadership, hybridity, public services, urban transition and citizenship.
- a world-leading unit in the study of Finnish public administration, finance and law in an international context.
- an internationally leading unit in the study of the sustainable transition of the public sector and urban development.

There is still some track to cover for the unit as such to become a recognized global leader in all the fields mentioned. On the other hand, the aim to become world-leading in the study of Finnish administrations seems not to be a very ambitious aim.

Despite the already good balance/integration of applied and other research, UoA6 would benefit from further scrutiny of the balance between the focus on international scientific excellence and the focus on more applied national policy-relevant projects.



According to the self-assessment report UoAS has improved its international research activity significantly since 2014. All of its research groups are publishing internationally in highly ranked outlets.

A clear plus is the high output of PhD students.

The aims of the Unit in terms of research are significant, and they show a level of scientific ambitiousness that is at an excellent level. However, the Unit could develop in more detail its planned actions to reach these aims. High scientific quality and many graduated PhD students indicate good quality.

## UoA7 Politics

### Summary of the UoA

The research of the Unit is good in terms of reach and significance. The research is useful and it has influence on the society at large.

The comparative politics research revolves around political institutions, systems and participation. Studies include several externally funded projects and concern executives and legislatures, policy-making and political parties, Europeanisation of domestic systems, elections and candidates, as well as decision-making, political participation and trust and elites.

In the area of decision-making, research focuses on individual behaviour and the potential for democratic innovations via controlled experiments producing quantitative data. This research links political science with philosophy, economics and psychology, for example through the project 'Future of Democracy (FutuDem)' with the Åbo Akademi Centre of Excellence. Through several projects, research in the unit challenges the dominance of socioeconomic explanations in political socialization by adopting a life-course perspective. Focusing on the role of civic education in schools, projects have compiled quantitative panel and cross-sectional data alongside qualitative ethnographic data. Yet other projects draw upon the history of ideas, most recently on the university and library institutions. They have also introduced survey and elite research methods into the study of energy policy and transitions.

The unit has well-established work on the international relations of northern Europe and its wider context. A pragmatist philosophy of science is part of the historical heritage of this work, as is the so-called English school tradition in International Relations, comprising open-ended, interdisciplinary approaches on the historical and contemporary international society of states.

In the area of EU-Russia relations, and to some extent Russian and Finnish foreign policy, the unit has not unreasonably regarded itself as the primary academic context in Finland and significant internationally. However, towards the 2020s this research direction waned. The reasons included the conclusion of activities of the Academy of Finland Centre of Excellence on 'Choices of Russian Modernisation' (2012-17) where the unit was a key partner, and a general decline of interest in Russia both intellectually and practically, and institutionally at TAU. Given subsequent events, one may retroactively regret this course of action.

## 1. Scientific quality

*Rating: 3*

Considering the compact size of the unit, the research is diverse theme-wise and multiple in theoretical and methodological orientations. The unit's profile features both well-established research orientations and work on new approaches and contributions to emerging research areas. Some of the research is highly interdisciplinary. The thematic, theoretical and methodological diversity is evident in the range of publication outlets used, which includes several high-quality outlets. However, while research outlets are solid, and include top European journals, the leading US journals are not in play. There is a good spread of researchers on the top 10 list.

In terms of citation indices, the unit's staff is on par with equivalent departments in the Nordic context. The bibliometric data are somewhat opaque. One would have liked to see some simple measures, such as an average (e.g. publication points based) measure of research productivity beyond the 'there are 13 permanent researchers and some 87 publications a year'-level. Still, the data suffices to conclude that the unit is very productive. All peer-review per year are 22,24,24, which divided on 13 would mean very high productivity.

The statistics show a good production of doctoral students. The overall impression is solid.

Given the high overall quality of research, further efforts could be made to place articles in the very leading journals.

## 2. Scientific impact

*Rating: 3*

In terms of geographical focus, the bulk of the unit's research is on niche areas such as northern Europe, Finland and until recently, Russia. These neighbouring areas are traditionally the home terrain of politics research at Tampere and belong to the core profile within the

national division of labour. This is also evident in the teaching and societal impact. Given the global academic division of labour this is fine, but in globalized 2022, one expects a well-rounded PolSci department to have at least some expertise on each of the five continents, through hiring (which it has in the case of China), or via adjuncting people (a possibility re American Studies). Africa is, not unproblematically, covered only in terms of development, while Latin America is not covered at all. However, Latin America seems to be left to Helsinki as part of a given national division of labour.

The report is rightly apologetic about having seen the collapse of one of Europe's leading Russia research environments. No proper explanation is given beyond the drying up of external funding, a case of leave and a suggested lack of interest from university as such. However, given contemporary trends in its environment, Finnish politics and Finnish security naturally remain existential issues for Finland, and Finnish security is key to European security overall. The intention to reclaim Russia so that it can stand with security and energy as a key focus is overdue – given the personnel working on the other two, one even wonders if Russia should not be the overarching priority.

In terms of impact in science institutions, several staff members serve in influential positions (which, in fairness, may also account for the drying up of research on Russia). In terms of impact through international collaboration, staff members have wide networks. During 2019-20, 32% of scientific publications (classes A, C) involved international collaboration. Staff members work not only in Anglo-American contexts but also compile field data and/or conduct research visits in countries such as Russia and Japan alongside data sets on Finland, the Nordic countries and continental Europe. Staff members also deem it important to publish in the Finnish language to maintain its status as a language of science. During 2019-21, 13% of scientific publications were in Finnish. When we are also counting policy briefs and publications intended for wider audience, 55% of all publications were in Finnish.

The unit shows a good performance all around. The focus on Russia should be resuscitated while there is still time. If nothing else then for teaching purposes, an effort should be made to cover global politics more broadly.

### **3. Societal impact**

*Rating: 4*

The unit's research serves a wide range of stakeholders and includes dissemination specifically tailored for stakeholder groups through projects where such engagement is a requirement. As already noted, regarding decision-makers, several staff members provide statements to committee hearings in the Finnish Parliament or are asked to offer advice to government

ministries. Staff members serve in policy planning and consultancy as committee members (e.g. parliamentary elections workgroup), while some cooperate with/offer advice to NGOs and activist groups. Many staff members have engaged in joint work and co-creative processes with authorities, companies and civil society actors via their projects. Several staff members are regular media commentators on major Finnish TV, radio and newspaper platforms. Staff members publish books intended for the general audience, attracting also media reviews, or publish blogs. The societal impact includes personnel exchange with the public and private sector. Younger age cohorts make up one essential stakeholder group. Staff members have published textbooks for upper secondary level schools, they have engaged in teaching cooperation with high schools in the Tampere area, and have also appeared in broadcasts for upper high school/college students.

Good external funding, extensive work with civil society as well as broad media exposure noted. Societal impact is high and should be kept that way, but given the already high score, this is not an area for further use of resources.

#### **4. Unit as a research environment**

*Rating: 3*

The unit has 13 permanently recruited staff members, most of whom spend some 40% of their time on research related activities. In addition, some two dozen researchers with limited teaching obligations (5-7%) strengthen the profile. They are recruited on the senior scholar, postdoc and doctoral levels, some of them to temporary salaried positions on grounds of externally funded projects or fellowships, while some of them are working on a grant basis outside of the unit's budget structure on resource agreements. The unit runs three platforms/infrastructures/research centres.

The personnel structure is appropriate for developing the research environment, with several PI level scholars among the regular staff members available to lead research and apply for external funding, some of them highly experienced in this regard (see Table 1). However, in a relatively small unit, circulation of staff is slow, as is the pace at which positions can be opened. This has implications for young scholars. While they benefit from external research funding acquired by the experienced PIs, it is of note to them that nowadays, permanent positions can be opened only with retirements that do not take place at regular intervals. Successful attempts at internationalising the student body are noted by the panel.

The unit is not in the social science faculty, but stays with management and administration. The unit seems to be satisfied with this. The panel finds this unusual from an international point of view.

The unit needs more transparency of budgets in order to do their work properly, it now only has control over a small teaching allocation.

The unit may want to consider exploring adjuncting people to round out its profile, and seeking the university's help in doing this. By the same token, the panel suggests to consider if one could strengthen bilateral ties with the University's peace institute (TAPRI).

## **5. Potential of the unit**

*Rating: 3*

The unit has during the past decade or so successfully sought to strengthen its research profile in three ways: by increasing external funding, via teaching staff appointments where research record is an important co-criterion and by protecting the research time of staff members.

However, the third aim has been challenging owing to a number of administrative reforms and development rounds at TAU incurring distractions. The volume of the unit's scientific publications (classes A, C) during 2019-21 demonstrates an upward trend. An increasing share is published in journals and book series that are highly ranked in the national JUFO system (JUFO 2, JUFO3). The panel welcomed the focus on seeking future ERC funding.

The unit seems set on staying small. We see the advantages, but want to raise the possibility of expansion.

The panel suggests the unit to work to recruit adjunct staff from elsewhere in the university, and the university should help this and other units in obtaining this.

## UoA8 History, Philosophy and Literature

### Summary of the UoA

UoA8 is a unit formed by bringing together the research potential of three disciplines, Literary Studies having chosen in 2019 to be linked to History and Philosophy that were already grouped together at the time of the previous Assessment (2014).

The Unit hosts the Academy of Finland Centre of Excellence (CoE) History of Experience and two research centres, one in Literary Studies, the other in History: Narrare: Centre for Interdisciplinary Narrative Studies, and Trivium: Tampere Centre for Classical, Medieval and Early Modern Studies.

The main research area of the discipline of History is the history of society. The CoE consists of three research teams (Consortium partners): Lived religion, Lived nation and Lived welfare state. Both the CoE and Trivium focus on *longue durée* analysis (e.g., dis/abilities, minority citizenship, children and childhood).

In Literary Studies, the main research areas are narrative studies (within the research centre Narrare) and historical poetics.

In Philosophy, the main research areas are Social Ontology, Normativity in Language, Social and Cognitive Diversity in Science and Social Philosophy of Technology. These constitute three intertwined research groups, each led by two senior PIs.

At present, within the unit only historians and the narrative theorists of Narrare collaborate effectively.

### 1. Scientific quality

*Rating: 3*

The Unit brings together top researchers, some of whom are internationally renowned and also intervene beyond the strictly academic sphere. On the other hand, the integration of young researchers in the Unit's scientific production is not reflected in the Top 10 Publications. The Unit foresees improvements supported by the panel, e.g. submitting winning applications to ERC as well as other European and Nordic funding instruments.

The Self-Assessment Report states that the Unit has been very successful in obtaining external funding. Statistics also show an increase of all kinds of external research funding, national, public and private ones, and perhaps international (difficult to appreciate on the bar graph), between 2020 and 2021. The discipline of History has hosted two consecutive CoEs, which is

rare: History of Experiences (2018-2025) was preceded by the CoE in the History of Society (2012-2017). Three other Finnish research consortia are also mentioned: The Literary in Life, 2015-2019, PI: Mari Hatavara; Instrumental Narratives, 2018-2022, PI: Maria Mäkelä, and Robotics and the Future of Welfare Services, ROSE, with Arto Laitinen as the vice director. An ERC Starting grant application, Authors of the Story Economy, PI: Maria Mäkelä, reached the interview stage of applications in 2022.

The Unit's scientific production is generally satisfactory (410 publications – 33 books and 377 articles – in 2019 and 2020, an average of 1.8 peer-reviewed articles or books per employee in 2020) and of good, even excellent quality (31 % of the publications in the highest category, JUFO3). It combines single author publications, which traditionally prevail in the field of humanities (5 in the Top 10 Publications), and co-authored publications (5 too, but only 1 co-authored by researchers belonging to different disciplines within the Unit).

Bibliometric data also show an increase of all kinds of peer-reviewed publications between 2019 and 2020, except JUFO2, the largest increase being in the JUFO1 category, and a significant increase in the share of international co-publications (5,3% in 2019, 11,5% in 2020). Open Access has also clearly increased for peer-reviewed publications.

In 2020, the number of publications in categories A&C was 86 in English and 40 in Finnish, and only 4 publications in other languages.

N.B.: The bibliometric data does not allow us to evaluate the specific productivity of each of the disciplines.

The Unit's strong international publishing profile is visible in the number of international publications, some of them appearing in the catalogue of good, average till excellent international publishing houses (Routledge, Palgrave MacMillan; Oxford University Press, Cambridge University Press), as well as in high level scientific journals of international reputation and circulation (Narrative, Poetics Today, Philosophy of Science, Synthese).

## **2. Scientific impact**

*Rating: 3*

The Unit attracts wide interest in national and international research communities, as indicated by editorial activities and evaluation and expertise activities. The CoE History of Experience has launched a publication series with Palgrave MacMillan ("Palgrave Studies in the History of Experience") and literary studies another one (Palgrave book series "Literary Urban Studies"). The Unit's members have contributed to various handbooks and encyclopaedias by Stanford

University Press, Oxford University, Cambridge University Press, Routledge, etc. Their involvement in expert missions is attested by many examples.

The Unit's members have leading roles in national scientific networks, organizations and boards. They also participate regularly in international organizations and conferences.

Many scholars in the unit have received national and international prizes for their research (Gad Rausing's prize of the Royal Swedish Academy of Letters, History and Antiquities, Finnish Academy of Science and Letters Prize for the Humanities, the Finnish Cultural Foundation's prize, Finlandia Prize for non-fiction).

Open science enhances scientific impact. The unit's members store their preprints or other publications in the University's repository. Many articles are published in full OA format. The journals edited by the unit are either full OA, e.g., the Journal of Social Ontology, or after a brief embargo. The CoE History of Experiences publishes OA anthologies and monographs in the Palgrave series.

The discipline of Literary Studies seems to have a particular degree of international visibility, thanks to its first area of research, narrative studies, which has been expanding internationally since the 2000s. Narrare is a world leader in the study of narrative from a dual perspective: literary and social sciences.

### **3. Societal impact**

*Rating: 3*

Its research areas and privileged study objects predispose the Unit to numerous collaborations outside the academic world, with external cultural institutions, mainly Finnish ones (Tampere museums: Vapriikki, The Muisti Centre of War and Peace, the Finnish Institute for Children's Literature, the Finnish Institute for Health and Welfare, the Child Advisory Board, appointed by the Prime Minister's Office, child welfare NGOs, but also companies, ministries, theatre groups and a women's prison).

Regular participation of members, in radio and television programs, especially by historians but also philosophers, as well as publications in newspapers, blogs, podcast series, or the organization of conferences dealing with political and social issues (e.g., democracy, inequality, urbanization, ethics, disinformation, dangers of narrative and fake news) contribute to the influence of the Unit and attest to its involvement in societal debates and its openness to contemporary cultural issues.



Educational publications (high school textbooks, completed or forthcoming) and productions are a sector also invested.

The societal impact of the Unit seems more limited internationally.

#### **4. Unit as a research environment**

*Rating: 2*

The Unit comprises 72 members (15,3% professors, 47,2% associate professors, senior research fellow, university lecturer, 23,6 % assistant professors, 13,9% doctoral researchers) and 87 doctoral students under supervision.

The discipline of History includes 5 professors and 1 tenure-track professor (career stage 3) in history and 1 professor in American Studies. Literary Studies has 2 professors, and Philosophy 2 professors and 1 tenure track professor. The predominance of History is obvious with regard to many aspects. The small number of professors in Literary Studies contradicts the importance the discipline clearly has in the dynamism and visibility, including internationally, of the Unit. There are 5 university lecturers in History, 4 in Literary Studies and 2 in Philosophy. Both History and Literary Studies have 1 university teacher, and Philosophy has 50% of a researcher's post. The other personnel (career stages 1-4) have fixed-term contracts on external funding, most notably from the Academy of Finland and major foundations.

All postdoctoral research in the unit is funded by external sources, as is the majority of PhD studies. Long-term external funding, such as CoE funding (eight years) brings some stability to the research environment.

The Unit has doctoral programs, with fixed-term salaried positions for doctoral students (3-6, i.e. 4-7% of doctoral candidates). The doctoral seminars function as the nexus for researchers at all career stages.

There is a tight connection between teaching and research on all levels of the staff (professors, doctoral and postdoctoral students): all teaching is research-based and all researchers teach regularly.

The essential research infrastructure includes a library with printed and electronic resources. The quality of research environment of the Unit seems to be good. But, according to the Self-Assessment Report, the threats include the University's plans to reduce office space, library facilities and research time (by burdening researchers with administrative tasks). The Unit has created important databases and an algorithm for the automated detection of narratives.

There is considerable international collaboration and mobility in the Unit. What is missing is perhaps long-term positions for visiting scholars (except in the case of Narrare and HEX). With external funding, HEX has established both short-term and long-term visiting fellow positions.

However, it seems to us that a research culture or cultures has not been conceptualized and installed so far. The research areas and research groups are mainly an effect of individual activities that have not been bundled content wise. In the presentation it was emphasized that there is a strong independency of each of the three sub-units, that were forced to work together by the university, but are working together happily. Research environment seems to be understood on a structural basis only (people, spaces, libraries, databases).

We should also like to highlight the Unit's lack of ethnocultural diversity, and particularly the fact that it does not seem to be treated as a concern, except among the narrative theorists. Given that we write 2022, we find this surprising,

The proportion of Finnish (80%) and international (20%) researchers leaves room for improvement

## 5. Potential of the unit

*Rating: 2*

We wonder whether the three disciplines can continue to coexist and lead researches independently of each other within the same Unit. There is huge potential for further collaborations, beyond the development of the existing collaboration between historians and narratologists.

But, the lack (or willingness) of strategic thinking and conceptualizing the unit is striking, but also with regard to the sub-units of History and Philosophy a series of different and individual actual research activities dominate the practice and thinking. The only overlapping field that was mentioned was "experience", which would be a powerful field of research, but it is not taken proactively as field to work together.

The discipline of History dominates in terms of number of professors and in terms of research structure, and also in terms of the unit's culture. However, it probably displays too many unrelated research areas in relation to the "clear, ambitious profile" that it claims.

The narrative unit is the most innovative and ambitious one, in terms of content, reflecting the own research and with regard to the future perspectives. Their object of study seems to lend itself very well to interdisciplinarity and the participation of researchers from other disciplines (within the Unit and beyond).

We encourage the establishment of an international master's programme in narrative theory.

## UoA9 Communication Sciences

### Summary of the UoA

This UoA is a vibrant multi and interdisciplinary unit comprising of nine thematic research groups covering a broad range of areas. The groups cut across the humanities and social sciences approaches to communication sciences and come together to form three research centres: COMET, TRIM, and T7. The UoA has a clear, complexity-conscious and self-critical understanding of its structure, its quality, its deficits and of its future plans that is well articulated and indicative of a well-developed awareness of its strengths and weaknesses in relation to the field broadly defined. There is a general orientation to the research of the unit towards “wicked problems” associated with democracy, social justice and equality that fit well with the university research strategy overall. These are explored through innovative research design that integrates humanities, social scientific and computational approaches via collaborative research that is genuinely open and curious.

There are also plans to develop and better integrate artistic research as part of a growing transdisciplinarity within the unit. This holds exciting possibilities for future work that could position the unit at the forefront of the field internationally. This will require further strategic focus as currently the place of artistic research – the T7 research centre - sits in a more peripheral relationship to the other centres in the unit. It is clear that the major and ongoing restructuring/re-organisation of the university has caused extensive disruption to research alongside the pandemic. But this is a unit that is trying pragmatically and strategically to find ways to address these challenges and is doing so enthusiastically. It has huge potential and is deserving of further structural support from the university.

### 1. Scientific quality

#### *Rating 4.5*

There is a great deal of research in this unit that is of world leading or internationally recognized quality in terms of novelty, originality, significance, rigour and scientific ambitiousness. There are a range of methodological approaches in evidence, different theoretical orientations and critical thinking that not only make a substantive contribution to the field but also help to set the

agenda particularly in the areas of journalism, media studies, communication studies, information science and games research, that should be recognized and applauded. These are fields where this unit excels. There is a well-developed awareness that multi/inter/transdisciplinary research demands longer time periods than are normally given for existing projects and that this is something that requires additional structural support and strategic planning. But this is a unit that is willing to take scientific risks to advance fundamental research so this would be time well spent and resources well distributed.

From the research outputs submitted it is not clear how much of the claimed multi/inter/transdisciplinary work makes it into publications – this may be an issue relating to the time required to undertake this work or a consequence of journal requirements, but it may be worth considering this in the future if it is to be seen as a hallmark of this unit. Similarly, some of the work is more visible than others, particularly that emanating from the T7 centre. Critical practice and artistic research can play a crucial part in challenging thinking, interrogating issues and disseminating ideas in different formats of an enlarged understanding of “publications”. It may be useful to explore further how this work can ‘speak to’ the work of the other centres, offer new and diverse means of dissemination and be better integrated into the unit.

## **2. Scientific impact**

*Rating: 4.5*

The unit has a range of scientific impact from grant capture to international peer reviewed publications indicative of high-level scientific impact. There is a large amount of work that is published as open access, in English, in high-ranking journals and almost a third (31%) of publications that have an international co-author, signalling the reach and reputation of the unit. Overall, the number and quality of publications has increased but it would appear that the number of research monographs has decreased (as is the case in several units). This may be a result of the pandemic but also may be indicative of the increasing workload that is placed upon staff and the publication requirements and/or ratings at a national level. Caution should be exercised here in encouraging quantity over quality in the longer term.

External funding comes predominantly from the Academy of Finland (70%) with only 4% on average coming from the EU, showing room for growth and potential for more large-scale international funding applications. There are researchers who are recognized internationally in the field in journalism, media studies, communication studies, games studies and information science, where the panel was aware of pioneering and innovative methodological work and in some instances research that is leading the field. However, the field of artistic research is under-developed in approach and less well represented in terms of content, number, positions

and profiles of the researchers. Other areas are emergent as significant in their fields such as Visual Studies. There are many researchers in the unit who play a major role in national and international research communities and subject associations, through keynote lectures and invited talks, through editorships etc. on journals thereby raising the profile of the work at Tampere but also influencing the direction of the fields themselves.

This unit is well placed to address key social, political, cultural and technological issues of our times in innovative and scientifically compelling ways. Scientific impact could be potentially increased through further embedding transdisciplinarity (as opposed to multidisciplinary) in research areas on key topics; through enabling emergent and aligned areas to gain in strength and profile to meet these transdisciplinary challenges as more equal partners; and through using this ambitious research agenda to help define the research identity of the unit overall.

### **3. Societal impact**

*Rating: 4*

The research of the Unit is excellent in terms of its national reach and significance. The research is relevant and provides new knowledge and solutions that benefit the society at large including with the public sector, NGOs and government committees. It increases understanding and contributes to the public conversation on different phenomena in communication sciences through regular media appearances and professional networks in communication and cultural industries. It is always difficult to evidence 'influence on public debates and decision making' when this is often dialogic, nebulous and long-term. But the panel were given concrete examples of many active partnerships outside of academia, in government consultations and committees, policy debates and in professional networks in the creative and cultural industries.

Impact work is notoriously difficult to relate. Given the expertise within the unit it may be useful to give further thought to the precise 'stories' these 'research impact relationships' tell and the reach and significance they point towards. It would have been useful to also hear more about how societal impact is taking place at an international level in relation to international research projects to further extend the reach and significance of the research of the unit. There is impressive work here that could be better told.

### **4. Unit as a research environment**

*Rating: 4.5*

The research environment of the Unit compares well to the best international units in the field in terms of research funding. There is a consistent grant capture from both national public and

private sources between 2019-2021 and in particular from the Academy of Finland as well as increase in award of doctoral degrees during the time period. But the funding context remains challenging. There is the potential to increase external funding particularly from the EU.

In terms of personnel structure, the 120 staff seem to be well spread across age groups and gender identity to ensure enough early career researchers for continuity of research areas. There is excellent integration of emeritus staff giving further stability and profile to certain research groups. In terms of recruitment, the number of international staff is 14.3% which appears to be good for Tampere but does not compare well to other departments internationally. It appears that challenges to the working environment are increasing as is the administrative workload both of which are a major detraction from the capacity to do high quality research and to write important publications. There remain ongoing concerns relating to workspace and facilities particularly for PhD researchers. These are fundamental issues, which when added to the impact of the pandemic, threaten to have real and long-term consequences for the unit if they are not addressed in the immediate future.

The research infrastructure of the unit provides regular opportunities for the exchange of research ideas and intellectual debate as well for developing new research projects through research seminars and reading circles. The Games research centre has a weekly newsletter that is distributed across the unit and brainstorming workshops open to all – these are indicative of the open and collegial research environment in evidence.

The new doctoral programme for multi/inter/transdisciplinary research in addition to two other PhD programmes, is welcomed and helps to further establish and profile this work. The PhD researchers are well supported and reported feeling cared for and content with their research experience. There is a noted lack of career opportunities for younger scholars that the unit is trying to manage through an annual staffing plan that includes tenure track positions and postdoc fellowships.

The Unit's national and international collaboration, mobility, networking, supervision and examining of PhD theses and recruiting are widespread, active and relevant and comparable to leading departments internationally.

To sustain this intellectually stimulating and productive research environment, securing working space for PhD students will be important; further cross-unit opportunities for research exchange would also be beneficial and an increased grant capture at the European level may further enhance research opportunities for junior researchers. An increase in international researchers within the unit could also bring new perspectives and increase the appeal of the unit overall.

## 5. Potential of the unit

*Rating: 5*

The research aims of the Unit show an excellent level of scientific awareness of the state of the art in a range of research fields enabling the unit to combine ambition with clarity of vision. This reveals an excellent understanding of the field internationally and how they wish to contribute to and shape it in coming years. The research culture that exists already now is impressive: the combination of relaxedness, stamina, desire to work together, curiosity, risk-taking, culture of discussion and reflectivity are the ingredients for a promising, novel research dispositive.

There is room for the research and impact strategies to be further developed in relation to opportunities for joint projects between research groups and beyond the unit; and the number of joint international projects could be increased. Reflecting on how the limitations and peripheral positioning of the artistic research in terms of critical mass and the danger of becoming an instrumentalised research support chain can be overcome to further invigorate genuine transdisciplinarity in the unit could also be beneficial. More thought could potentially be given to the specific ways in which each of the research groups and then their combined research value contribute to the field and how this can help identify a 'Tampere approach to Communication Science'.

It is clear that implementation plans for research development are being stymied at several levels by the poor level of institutional support. But in general, given adequate institutional support, the unit shows great future potential. With further strategic direction and better institutional resourcing this unit has the potential to flourish even further.

## UoA10 Social Research

### Summary of the UoA

This is a large and complex unit comprised of 173 staff across 6 disciplines and 4 research streams doing a range of multi/inter and sometimes transdisciplinary research related to the university themes of society, health and technology. There are a further 4 research centres that cut across these disciplines, streams and themes. Articulating 4 research streams from such multifarious research is no mean feat. Yet, while these streams capture much of the research that is undertaken in this unit, they are suggestive of more research integration than may be present on the ground. There is common pursuit of critical research across the unit that currently houses 174 research projects. The research streams of the unit stretch from classical sociological queries to problems of the new millennium such as horizons of a sustainable future, digitalization, aging problems and the globalization of work and everyday life. Much of this work was well established prior to the merger and has continued to flourish since. The scale of achievements is impressive including the notable success in grant capture as well as the level of engagement in external/international research activities and societal impact at national and international levels. This unit has research expertise that is longstanding and high quality but also struggled to articulate its future direction and longer term understanding of where it can innovate and contribute to the development of the many fields of enquiry it speaks to, while retaining a sense of coherence and identity across its multiple parts.

### 1. Scientific quality

*Rating: 4.5*

This is a vibrant and successful research unit with much to commend it in terms of scientific quality. The research of the Unit consists of work that is internationally excellent or world leading quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness. It has secured 3 current ERC projects and 76 Academy of Finland projects and has an annual project funding of Euro 7.1m. Whilst this is a large unit the self-assessment notes the remarkable fact that one in two faculty members leads one or more externally funded projects indicative of a unit that carries a strong scientific reputation nationally and internationally. The research covers a range of methodological approaches and is theoretically sophisticated responding to societal challenges in rigorous and intellectually compelling ways. The number of peer reviewed publications increased during the years covered by TAU RAE with almost half of all publications rated as JUFO 2 or 3 and more outputs placed in high quality internationally recognized journals and reputable book publishers. However, only 65% of



publications were open access which for social research of such importance is rather low. International co-publication was also limited with only 16.4% of publications in 2020 with at least one author affiliated to a non-Finnish organization. This may be indicative of the Finnish focus of much of the research undertaken. Nonetheless, this work has relevance for the field internationally yet is rarely progressed through internationally collaborative publications in top rated journals.

The high competence in both theory-building and methodological development is visible in both faculty CVs and the chosen ten publications that are world leading or internationally excellent in terms of significance and scientific rigour. The panel noted that some of the publications are representative of more traditional approaches and reveal rather less originality and scientific ambitiousness. Nonetheless there was also evidence of an openness for new challenges in some of the work.

This unit attracts funding with relative ease so is in a good position to advance social research through innovative and ambitious funding applications. In such a diverse unit this could be embraced through research that celebrates these disciplinary differences and seeks new insights through transdisciplinarity, extending the focus beyond traditional social scientific approaches. This could be further enabled through more international collaborations. Given that research in this unit is of such social significance it would be beneficial for it to reach as wide a readership as possible – the unit may want to consider how this could be partly advanced through more open access publications.

## **2. Scientific impact**

*Rating: 4*

This unit has been at the forefront of key developments in a range of fields including the establishment of the Crossroads in Cultural Studies conference series that led to the establishment of the Association for Cultural Studies that now hosts the Crossroads Conference – a major scientific intervention in the field. It has established a leading journal in cultural studies (EJC). These initiatives took place many years ago but are on-going. It also organizes the biennial series of Power Conferences which established the Society of the Study of Power Relations as well as founding the Relational Studies Hub. These initiatives have developed great interest in the global academic community and been a major influence in the development of these areas. The unit is well known internationally for its work some of which is evidently world leading. The unit has staff that take leading positions in influential academic associations and funding organisations. There are also several staff who are invited to give keynote lectures at prestigious academic events. However, the self-assessment over relies on a few established

senior professors to make its case for scientific impact. Whilst this is commendable for the two scholars concerned it leaves the unit in a vulnerable position when they retire. More evidence of high-level scientific impact across (this very large) unit would have better illustrated the potential of the unit going forward. A wider range of staff have a lower level of impact as editors or co-editors of journals and book series, as advisory board members, organize conferences and events and are active members of research networks and projects.

Identifying and developing researchers with potential to invigorate and sustain the scientific impact of the unit over the coming decade may be a worthwhile endeavour for the long term health and vitality of the research of the unit.

### **3. Societal impact**

*Rating: 4.5*

Societal impact is a major strength of this unit. The research of the Unit is excellent in terms of its reach and significance at local, national and international levels. It has received public prizes for its work for societal impact at a local and national level for research that is highly relevant and relates to crucial social issues such as dealing with gender-based violence in schools. It provides new knowledge and solutions that significantly benefit the society at large, and profoundly increases understanding on different social phenomena through its large teaching programme across undergraduate, Masters and PhD levels. This unit encompasses a wide range of research that is societally relevant and politically engaged providing research data for civic debate, public administration and planning across a host different social and political issues. For example, it has developed a model for youth societal participation that became part of the government's programme; developed local authorities strategic competences in sustainable development; has contributed to parliamentary debates; provided marginalized communities in the African diaspora with opportunities for social participation; contributed to debate on a peace plan for the war in Yemen.

Given the subject areas of this unit it is hardly surprising (though no less difficult) that the research has had this level of societal impact and this is testimony to the drive and commitment of the researchers involved. There is genuine opportunity here for greater international reach and broader ambition for meaningful research that can have important impact.

#### 4. Unit as a research environment

*Rating: 4*

The research environment of the unit compares favourably to leading international units in the field in terms of research funding as noted above. The unit receives a large share of national research funding with steady growth in international funding indicative of a healthy and flourishing research environment. It attracts a range of Fullbright scholars and visiting researchers that are relevant to its research areas and contribute to a dynamic and collaborative environment with a welcoming community spirit.

In general, the personnel structure supports quality research in the 6 disciplines of the unit. All staff in the unit are research active but there remain differentials in research time across career stage. Where there are clear differentials in the numbers of established professors across research areas this has obvious limitations for how that area is able to develop and favours those areas with established and senior research posts. There is a good breakdown of faculty in the four career phases (1: 35%, 2: 25%, 3: 30%, 4: 10%) but several retirements are expected in the coming years. It will be important to retain these posts at the established professor level to ensure and invigorate research leadership within the unit. There is clear potential to increase the level of international staff in the unit.

As with other units there exists a critical need for additional administrative resources in research support without which the research environment is likely to falter. The panel noted that there is a small amount of funding available for applying for research grants and research dissemination but that support for research expenses between projects is insufficient. This may be more of an issue in a unit of this size with so many funded projects on the go.

The unit has a healthy research culture with regular researcher meetings and seminars that are open for everyone and supplemented with “numerous” researcher visits, guest lectures and seminars. It could be beneficial to the unit to increase its international exchanges to encourage further international research funding applications and greater internationalization of staff and students. Possibilities for increasing awareness of the new structure and visibility of researchers within it, could be enhanced by research initiatives organized around the 4 research streams of the unit – from conferences to reading groups to research sharing forums.

## 5. Potential of the unit

*Rating: 3.5*

Given the current size and constraints regarding workload and lack of administrative support the strategic direction of this unit is to consolidate and strengthen existing research areas whilst striving for excellence. The aims of the Unit in terms of research are meaningful in that this is research that has reach and significance, and they show a level of scientific ambitiousness that is at a good level. The Unit's planned actions to reach their aims are feasible but to do this will require more effort on international funding to develop a steady income for all 4 streams of research activity. This in turn, will require further administrative research support. There is a danger that this unit will become dominated by the larger disciplines and by a few 'star' players to the detriment of the smaller disciplines/areas that need to be balanced out in terms of senior staff positions – particularly in gender studies, social psychology and social anthropology. Or, that the unit will remain in disciplinary silos and resist the possibility of cross fertilization and new research approaches through transdisciplinary work. In the face of imminent retirements, this may be something that is worth giving further consideration to.

So while the Unit shows good future potential it is somewhat lacking in critical social imaginaries for its own shape and direction.

## Appendixes

Appendix 1: General principles for monitoring and evaluating research in Tampere University

Appendix 2: Terms of Reference for Technology, Health and Society Panels

Appendix 3: Terms of Reference for the Second Stage

# General principles for monitoring and evaluating research in Tampere University

Approved by the Academic Board on 20 October 2020

The principal aim of all research activity should be to undertake internationally outstanding work that has significant scientific and/or societal (cultural, economic, social or technological) impact. Research is inherently dynamic, with focus areas and initiatives changing over time. Tampere University research evaluations aim to provide information useful for advancing the high quality and impact of research. Information gained through evaluation is used for setting strategic goals and monitoring progress towards those goals, as well as supporting institutional development and decision-making. The university also has a duty of accountability to external stakeholders.

Research at Tampere University is extremely diverse in terms of disciplines, methods and research cultures. Accordingly, the rationale and form of each research evaluation will be decided on a case-by-case basis. The evaluation system must be reliable and trustworthy. Hence, all research evaluations will be designed and conducted following national and international guidelines on responsible evaluation. In addition, the university has its own principles regarding the evaluation of research. These principles take into consideration the university's strategic aims.

It is critical to ensure that evaluation approaches keep up with the inherently dynamic nature of research and that they are in line with the university's strategy. After each evaluation, the chosen approach will be evaluated regarding how well the evaluation reached its aim of providing information that is useful for institutional development and decision-making, setting of strategic goals, and monitoring progress towards those goals. Evaluation approaches will be developed accordingly.

The evaluation process involves both *monitoring* – collecting appropriate data and reflecting on research activity, and periodic *evaluation* – a more formal process that takes a 'snapshot' of the current state of research.

Monitoring is needed mostly to support faculties, research units and individual researchers in their self-reflection, ongoing decision-making and facilitation of research activity. Monitoring helps make activity visible, and it is best undertaken as a continuous process – this both aids continuous reflection and will also alleviate the burdens of periodic evaluations.

Tampere University is a multidisciplinary university; it is therefore essential that differences in scientific fields are recognized and taken into consideration in evaluation. With regards to monitoring, this means that differences in aims and indicators must be accepted.

This proposal does not consider the evaluation of individual researchers. For evaluating individual researchers, Tampere University will commit to the national guidelines.

1. Evaluations advance high-quality science and research. Evaluations help the University to develop its preconditions for doing research for the betterment of high-quality and impactful science.

2. Evaluation systems must reflect the diversity of different disciplinary needs and approaches. There is no single method or indicator available for Tampere University, so a diversity of methodology and indicators must be allowed. There should be customized aims for units under evaluation (e.g. faculties) and thereby tailored indicators. We should follow the 'one size does not fit all' principle.

3. Evaluation should reflect accountability. The university is in partnership with society, which funds its research. As such, the university should demonstrate that the funds are used to the benefit of society and science. Evaluation should reveal how we interact with wider society and our level of integration. In our research we must also be accountable to the scientific community, and evaluation should reveal the level of our scientific impact and the quality of our research.

4. Focus on all dimensions of scientific productivity. Inputs (resources – such as time or funding) and outputs (tangible results – such as publications) of the research process are more readily quantifiable, and they tell us something about efficiency (that is, the relationship between inputs and outputs). The scientific quality as well as scientific and societal impact of research are harder to measure. In order to gain a comprehensive picture of the target of evaluation, the different dimensions of scientific productivity as well as the relationships between them must be taken into account.

5. Judgement will always be involved. When using quantitative indicators as data inputs it is important to keep in mind that the interpretation of metrics involves judgement. Both qualitative and quantitative information is needed, as well as rigorous and robust systems for reaching fair judgements. Fair judgements require appropriate and transparent processes as well as resources to make sure we are gathering relevant information and using that information responsibly.

6. Evaluation should promote the consideration of impact as an integral part of the research process, rather than only as an act of measurement in the assessment phase. Evaluation of impact involves recognition of a wide variety of research-related activities. Care should be taken to avoid the collection of such data being onerous.

7. Evaluation should also consider the quality of the university's research environment as a site for research work. Evaluation should reveal the quality of the university as an institution in facilitating and promoting research activity. This might include practical support arrangements, the availability of appropriate infrastructure, staffing and staff development/rewards, and general culture.

8. Evaluation should be cost-effective. Evaluation regimes should not place undue burdens and stress on researchers; evaluations should be enabling, not judgmental. The workload of any evaluation should be proportional to the aims and anticipated outcomes of the evaluation. Evaluative processes need to be mindful of the needs for data – how it will be collected, at what cost, and the accuracy and robustness of existing data.



**Tampere University Research Assessment Exercise 2022**

**TAU RAE 2022**

**Terms of Reference for Technology, Health  
and Society Panels**



## 1. Introduction

This document defines the Terms of Reference (ToR) for the expert panels for technology, health and society in the Research Assessment Exercise of Tampere University (TAU RAE 2022). In order to take into account field-specific differences, separate assessment criteria were defined for each of the three panels.

Tampere University started operation in 2019. It was created through a merger between the University of Tampere and Tampere University of Technology. It is one of the most multidisciplinary universities in Finland, bringing together research and education in technology, health and society. The University is a community of 21,000 students and close to 4,000 staff. There are seven faculties with more than 100 active research groups and centres.

Tampere University's strategy, "Together for a Sustainable World", establishes a long-term framework for strategic development until 2030 (Strategy 2030: <https://www.tuni.fi/en/tuni-strategy>). It is based on the existing areas of strength and expertise: technology, health and society. As a means of advancing sustainability, Tampere University focuses on the development of solutions to tackle climate change, to preserve natural environment, and to improve the well-being and sustainability of societies. In terms of research, the ultimate goals are scientific excellence and societal impact. Undergoing external research assessments is one of the strategic actions supporting the improvement of the scientific quality of research.

This is the first comprehensive external and international research assessment conducted at Tampere University. In the former institutions research assessments were conducted in 2004 and 2014 at the University of Tampere, and in 2011 and 2017 at Tampere University of Technology.

## 2. Background of the Assessment

Research conducted at Tampere University is assessed in three panels: technology, health and society. The units of the Faculties act as Units of Assessment (UoA). The UoAs selected which panel they wish to be assessed in.

In the panel for technology there are eight units of assessment from four Faculties: Faculty of Built Environment (BEN), Faculty of Engineering and Natural Sciences (ENS), Faculty of Information Technology and Communications Sciences (ITC) and Faculty of Management and Business. The units are listed in table 1.

Table 1. Units of assessment in the panel for technology

Faculty	Unit
BEN	Architecture
BEN	Civil Engineering
ENS	Automation Technology and Mechanical Engineering
ENS	Materials Science and Environmental Engineering
ENS	Physics

ITC	Computing Sciences
ITC	Electrical Engineering
MAB	Industrial Engineering and Management

In the panel for health there are three units from two Faculties: Faculty of Medicine and Health Technology (MET) and Faculty of Social Sciences (SOC). The units are listed in table 2.

Table 2. Units of assessment in the panel for health

<b>Faculty</b>	<b>Unit</b>
MET	BioMediTech
MET	Clinical Medicine
SOC	Health Sciences

In the panel for society there are ten units from four Faculties: Faculty of Education and Culture (EDU), Faculty of Information Technology and Communication Sciences (ITC), Faculty of Management and Business (MAB) and Faculty of Social Sciences (SOC). The units are listed in table 3.

Table 3. Units of assessment in the panel for society

<b>Faculty</b>	<b>Unit</b>
EDU	Education
ITC	Communication Sciences
ITC	Language Studies
MAB	Administrative Studies
MAB	Business Studies
MAB	Information and Knowledge Management
MAB	Politics
SOC	History, Philosophy and Literature
SOC	Social Research
SOC	Welfare Sciences

Implementing responsible research assessment has been a priority at Tampere University from the very beginning. The University signed the San Francisco Declaration on Research Assessment (DORA) as the first Finnish university in March 2019. This assessment is designed

and conducted following national and international guidelines on responsible evaluation<sup>1</sup>. In addition, the university has its own principles regarding the evaluation of research that are followed (Appendix 1).

Key principles guiding this assessment are reflecting the diversity of different scientific fields and taking different dimensions of scientific productivity into account in the formulation of assessment criteria as well as the selection and defining of assessment methods and indicators. In accordance, a diversity of assessment methodology and indicators have been allowed between panels, and to some degree also within panels. In addition, UoAs were invited to take part in the planning of the assessment material in order to produce material that is relevant to all units within each panel, to ensure a meaningful evaluation for all disciplines.

Ensuring that the assessment material is relevant, and therefore useful to UoAs is also in accordance with the principle of cost-effectiveness. It is important that the workload of the assessment is proportional to the aims and anticipated outcomes of the assessment.

### 3. Objectives of the Assessment

The purpose of TAU RAE 2022 is to assess the scientific quality and scientific and societal impact of the research conducted at the UoAs, the UoAs as research environments and the future potential of the UoAs. Also, in accordance with Tampere University's strategy and values, interdisciplinarity and multidisciplinary, open science, societal interaction and internationality are considered as important elements of scientific quality, and scientific and societal impact. Therefore, the role of these elements in the UoAs' research activities are also examined.

The aim of the assessment is to provide information that is useful for advancing the high quality and impact of research.

The results of the assessment will be utilized in setting strategic goals and monitoring progress towards those goals, as well as supporting institutional development and decision-making.

### 4. Organization of the Assessment

The assessment is conducted following the general principles for monitoring and evaluating research approved by the Academic Board (Appendix 1). The Rectorate initiated the assessment process on 1 December 2020 and the Science Council was involved in the preliminary planning of the implementation of the assessment. In order to ensure the impartiality of the assessment, an external Steering Group to manage the assessment process was nominated in June 2021. However, to maintain communication between the assessment process and the university's strategy, Tampere University's Provost is a member of the Steering group. The TAU RAE Project Leader acts as the secretary for the Steering Group. Please see Appendix 2 for the members and duties of the Steering Group.

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<sup>1</sup> Good practice in research evaluation. Recommendation for the responsible evaluation of a researcher in Finland (<https://avointiede.fi/fi/linjaukset-ja-aineistot/kotimaiset-suositukset/tutkijanarviinnin-hyvat-kaytannot>); DORA (<https://sfdora.org/>); Leiden Manifesto (Hicks et al. 2015).

## 5. Working arrangements

The expert panel for Technology consists of 11 members. A Chair is appointed to the panel to direct the panel's work. It is the Chair's responsibility to ensure that the panel produces its report on time.

The panel should ensure through discussions that all the panel members have a similar understanding of the application of the assessment criteria and the rating scale. The panel should also ensure that the assessment report takes into account all the material available, including all the assessment documents, site visits and interviews. The panel is expected to finish the final draft of the assessment report during the site visit week in Tampere. The report should be written on the assessment form.

The assessment and its organization are funded by Tampere University, which will pay expert fees to the panel Chair and panel members as well as reimburse all the travel and accommodation expenses relating to the site visit week.

The final report published by Tampere University will include the panel's report without any changes in substance.

### 5.1 Desk work and site visit week

The panel members base their assessment on desk work at their home institution prior to the site visits and on interviews and discussions during the site visit week in Finland.

Desk work is carried out prior to the site visit week and is based on:

- UoAs' self-assessment reports
- details concerning the academic staff of the UoAs
- details concerning the research output of the academic staff of the UoAs
- details concerning the funding of the UoAs
- background information about Tampere University and the Finnish higher education and research system

All the material will be provided to the panel members by the assessment organization five weeks before the site visit.

### 5.2 Confidentiality

The panel members agree to refrain from making use and/or divulging to third parties any non-public material, facts, information, documents or other matters brought to their attention during the Research Assessment Exercise. The materials included in the assessment reports as well as all the ratings are strictly confidential until the publication of the final report that summarizes all the results. The final report is the main instrument for communicating the results of the Research Assessment Exercise.

### *5.3 Conflict of interest*

The panel members are required to sign a declaration of the lack of conflict of interest. For example, the panel members should not have been engaged in joint research projects with the researchers or units they assess or have written joint publications with them, from the beginning of 2016 until present time. A panel member is disqualified if his/her impartiality is endangered. If a panel member is contacted by a member of a Unit of Assessment, the panel member should discuss the issue immediately with the assessment organization.

# ASSESSMENT CRITERIA FOR TECHNOLOGY PANEL

## 1. Implementation of the Assessment

The units of the Faculties act as Units of Assessment (UoA). The unit structure within the Faculties is somewhat rigid and does not fully represent the organization of research. The units are multidisciplinary, and research groups and centres within units could belong to different assessment panels. In the absence of a perfect unit of assessment, Faculty units are considered optimal in the context of this assessment as they cover all of the university's research activity and they support implementing conclusions made based on the results as existing organizational units before and after the assessment.

The assessment period is short, as Tampere University only started operating in 2019. This means that the time period for the background material concerning the UoAs (i.e. information on members of the UoA, research output, research funding, doctoral degrees) is 2019-2021. Most of the publication analyses cover only the years 2019-2020, as the publication data is not yet fully complete for the year 2021. However, a tentative trend analysis on publishing productivity including also publications from the year 2021 will be compiled to provide a preliminary look at the more recent developments in UoAs' publishing productivity.

It should be noted that due to the short time period, background material should not be given too much emphasis in the assessment. The primary assessment material is the self-assessment report submitted by the UoAs. The assessment materials only include the research performance of those members of the UoAs who were employed by Tampere University on the Census date, 1 October 2021.

## 2. Assessment criteria

The panel is asked to present a written statement and a numerical rating of each assessment criteria (discussed in sections 2.1.-2.5. below). Please note, that the numerical rating represents the level of the whole UoA but it is possible to highlight parts of the UoA in the written statement if they considerably differ from the overall rating. In addition, the panel is asked to summarize its views on the units being assessed, as well as the assessment process in general. The report will be written on the assessment form.

The assessment criteria discussed in sections 2.1.-2.3. below (scientific quality, scientific impact and societal impact) apply to the introduction of the unit's research activities (section 1 in the self-assessment report).

### 2.1. Scientific quality

For this criterion the panel assesses the novelty, originality, significance, scientific rigour, and scientific ambitiousness of the research conducted in the unit.

The numerical rating scale:

#### 5 Outstanding

The research of the Unit is of world leading quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness.

#### 4 Excellent

The research of the Unit is internationally recognized and of excellent quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness.

#### 3 Good

The research of the Unit is of good quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness.

#### 2 Satisfactory

The research of the Unit is of satisfactory quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness.

#### 1 Weak

The research of the Unit falls below the quality levels described above.

### *2.2. Scientific impact*

For this criterion the panel assesses the significance and relevance of the research conducted in the unit and its contribution to the scientific community.

#### The numerical rating scale:

#### 5 Outstanding

The research of the Unit is leading or at the forefront of the research area. It attracts great interest in the global academic community, and it has a major influence on a research theme or area.

#### 4 Excellent

The research of the Unit attracts wide interest in the academic community. It makes significant contributions to a research theme or area.

#### 3 Good

The research of the Unit attracts attention in the academic community. It provides useful knowledge and has an influence on a research theme or area.

#### 2 Satisfactory

The research of the Unit attracts some attention in the academic community. It is useful and has a minor influence on a research theme or area.

#### 1 Weak

The research of the Unit has limited scientific impact in its research areas.

### 2.3. Societal impact

For this criterion the panel assesses the reach and significance of the research conducted in the unit in terms of society at large as well as its relevance and if it contributes to producing new knowledge or solutions or increasing understanding on different phenomena. The panel should also consider how results are disseminated and how well external stakeholders are engaged.

Please note that it is possible to reach the highest rating with local, national and/or international relevance.

#### The numerical rating scale:

##### 5 Outstanding

The research of the Unit is outstanding in terms of reach and significance. The research is highly relevant and provides new knowledge and solutions that significantly benefit the society at large, and profoundly increases understanding on different phenomena.

##### 4 Excellent

The research of the Unit is excellent in terms of reach and significance. The research is relevant and provides new knowledge and solutions that benefit the society at large, and increases understanding on different phenomena.

##### 3 Good

The research of the Unit is good in terms of reach and significance. The research is useful and it has influence on the society at large.

##### 2 Satisfactory

The research of the Unit is satisfactory in terms of reach and significance. The research results can be useful and it has some societal influence.

##### 1 Weak

The research of the Unit has limited societal influence.

In accordance with Tampere University's strategy and values, interdisciplinarity and multidisciplinary, open science, societal interaction and internationality are considered as important elements of scientific quality, and scientific and societal impact. Therefore, the panel is also asked to examine the role of these elements in the unit's research activities, and how they support the scientific quality and scientific and societal impact of the research conducted at the unit.

### 2.4. Unit as a research environment

In assessing the unit as a research environment, the panel should consider if the unit has sufficient infrastructure, if the personnel structure supports conducting quality research, if the funding structure is well-balanced, if the unit is international in terms of recruiting, networking and collaboration, if the mobility and networking (national and international) are relevant, and if there are enough early career researchers to ensure continuity of its fields.

#### The numerical rating scale:



#### 5 Outstanding

The research environment of the Unit is fully comparable to the leading international units in the field in terms of infrastructure, personnel structure and research funding. The Unit's national and international collaboration, mobility, networking, and recruiting are active and highly relevant.

#### 4 Excellent

The research environment of the Unit compares well to the best international units in the field in terms of infrastructure, personnel structure and research funding. The Unit's national and international collaboration, mobility, networking, and recruiting are active and relevant.

#### 3 Good

The research environment of the Unit is good in terms of infrastructure, personnel structure and research funding. The Unit makes good use of national and international collaboration, mobility, networking, and recruiting.

#### 2 Satisfactory

The research environment of the Unit is adequate in terms of infrastructure, personnel structure or research funding. The Unit has national and international collaboration, mobility, networking, and recruiting.

#### 1 Weak

The research environment of the Unit falls below the levels described above.

### *2.5. Potential of the unit*

In assessing the potential of the unit, the panel should consider the significance and the level of ambitiousness of the unit's aims in research and how relevant, reasonable and feasible are the planned actions to reach those aims.

#### The numerical rating scale:

#### 5 Outstanding

The aims of the Unit in terms of research are highly significant and they show a level of scientific ambitiousness that is at an outstanding level. The Unit's planned actions to reach their aims are feasible. The Unit shows great future potential.

#### 4 Excellent

The aims of the Unit in terms of research are significant, and they show a level of scientific ambitiousness that is at an excellent level. The Unit's planned actions to reach their aims are feasible. The Unit shows very good future potential.

#### 3 Good

The aims of the Unit in terms of research are meaningful, and they show a level of scientific ambitiousness that is at a good level. The Unit's planned actions to reach their aims are quite feasible. The Unit shows good future potential.

#### 2 Satisfactory

The aims of the Unit in terms of research are adequate, and they show some scientific ambitiousness. The Unit has planned actions to reach their aims. The Unit's future potential is Satisfactory

1 Weak

The Unit's potential falls below the levels described above.

# ASSESSMENT CRITERIA FOR HEALTH PANEL

## 1. Implementation of the Assessment

The units of the Faculties act as Units of Assessment (UoA). The unit structure within the Faculties is somewhat rigid and does not fully represent the organization of research. The units are multidisciplinary, and research groups and centres within units could belong to different assessment panels. In the absence of a perfect unit of assessment, Faculty units are considered optimal in the context of this assessment as they cover all of the university's research activity and they support implementing conclusions made based on the results as existing organizational units before and after the assessment.

The assessment period is short, as Tampere University only started operating in 2019. This means that the time period for the background material concerning the UoAs (i.e. information on members of the UoA, research output, research funding, doctoral degrees) is 2019-2021. Most of the publication analyses cover only the years 2019-2020, as the publication data is not yet fully complete for the year 2021. However, a tentative trend analysis on publishing productivity including also publications from the year 2021 will be compiled to provide a preliminary look at the more recent developments in UoAs' publishing productivity.

It should be noted that due to the short time period, background material should not be given too much emphasis in the assessment. The primary assessment material is the self-assessment report submitted by the UoAs. The assessment materials only include the research performance of those members of the UoAs who were employed by Tampere University on the Census date, 1 October 2021.

## 2. Assessment criteria

The panel is asked to present a written statement and a numerical rating of each assessment criteria (discussed in sections 2.1.-2.4. below). Please note, that the numerical rating represents the level of the whole UoA but it is possible to highlight parts of the UoA in the written statement if they are considered to differ from the overall rating. In addition, the panel is asked to summarize its views on the units being assessed, as well as the assessment process in general. The report will be written on the assessment form.

The assessment criteria discussed in sections 2.1.-2.2. below (scientific quality and impact, and societal impact) apply to the introduction of the unit's research activities (section 1 in the self-assessment report).

### 2.1 *Scientific quality and impact*

For this criterion the panel assesses the novelty, originality, significance, scientific rigour, and scientific ambitiousness of the research conducted in the unit. In addition, the panel assesses the relevance of the research conducted in the unit as well as its contribution to the scientific

community. The panel should also consider if the unit's research is sufficiently versatile and up-to-date in terms of methodologies used.

The numerical rating scale:

5 Outstanding

The research of the Unit is of world leading quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness. In terms of scientific impact, the research of the Unit is leading or at the forefront of the research area. It attracts great interest in the global academic community, and it has a major influence on a research theme or area.

4 Excellent

The research of the Unit is internationally recognized and of excellent quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness. In terms of scientific impact, the research of the Unit attracts wide interest in the academic community. It makes significant contributions to a research theme or area.

3 Good

The research of the Unit is of good quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness. In terms of scientific impact, the research of the Unit attracts attention in the academic community. It provides useful knowledge and has an influence on a research theme or area.

2 Satisfactory

The research of the Unit is of satisfactory quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness. In terms of scientific impact, the research of the Unit attracts some attention in the academic community. It is useful and has a minor influence on a research theme or area.

1 Weak

The research of the Unit falls below the quality levels described above and it has limited scientific impact in its research areas.

## 2.2. Societal impact

For this criterion the panel assesses the reach and significance of the research conducted in the unit in terms of society at large as well as its relevance and if it contributes to producing new knowledge or solutions or increasing understanding on different phenomena. The panel should also consider how results are disseminated and how well the unit is engaged with stakeholder networks.

Please note that it is possible to reach the highest rating with local, national and/or international relevance.

The numerical rating scale:

5 Outstanding

The research of the Unit is outstanding in terms of reach and significance. The research is highly relevant and provides new knowledge and solutions that significantly benefit the society at large, and profoundly increases understanding on different phenomena.

#### 4 Excellent

The research of the Unit is excellent in terms of reach and significance. The research is relevant and provides new knowledge and solutions that benefit the society at large, and increases understanding on different phenomena.

#### 3 Good

The research of the Unit is good in terms of reach and significance. The research is useful and it has influence on the society at large.

#### 2 Satisfactory

The research of the Unit is satisfactory in terms of reach and significance. The research results can be useful and it has some societal influence.

#### 1 Weak

The research of the Unit has limited societal influence.

In accordance with Tampere University's strategy and values, interdisciplinarity and multidisciplinary, open science, societal interaction and internationality are considered as important elements of scientific quality, and scientific and societal impact. Therefore, the panel is also asked to examine the role of these elements in the unit's research activities, and how they support the scientific quality and scientific and societal impact of the research conducted at the unit.

### *2.3. Unit as a research environment*

In assessing the unit as a research environment, the panel should consider if the unit has sufficient infrastructure, if the personnel structure supports conducting quality research, if the funding structure is well-balanced, if the unit is international in terms of recruiting, networking and collaboration, if the mobility and networking (national and international) are relevant, and if there are enough early career researchers to ensure continuity of its fields.

#### The numerical rating scale:

#### 5 Outstanding

The research environment of the Unit is fully comparable to the leading international units in the field in terms of infrastructure, personnel structure and research funding. The Unit's national and international collaboration, mobility, networking, and recruiting are active and highly relevant.

#### 4 Excellent

The research environment of the Unit compares well to the best international units in the field in terms of infrastructure, personnel structure and research funding. The Unit's national and international collaboration, mobility, networking, and recruiting are active and relevant.

#### 3 Good

The research environment of the Unit is good in terms of infrastructure, personnel structure and research funding. The Unit makes good use of national and international collaboration, mobility, networking, and recruiting.

#### 2 Satisfactory

The research environment of the Unit is adequate in terms of infrastructure, personnel structure or research funding. The Unit has national and international collaboration, mobility, networking, and recruiting.

#### 1 Weak

The research environment of the Unit falls below the levels described above.

### *2.4. Potential of the unit*

In assessing the potential of the unit, the panel should consider the significance and the level of ambitiousness of the unit's aims in research and how relevant, reasonable and feasible are the planned actions to reach those aims.

#### The numerical rating scale:

#### 5 Outstanding

The aims of the Unit in terms of research are highly significant and they show a level of scientific ambitiousness that is at an outstanding level. The Unit's planned actions to reach their aims are feasible. The Unit shows great future potential.

#### 4 Excellent

The aims of the Unit in terms of research are significant, and they show a level of scientific ambitiousness that is at an excellent level. The Unit's planned actions to reach their aims are feasible. The Unit shows very good future potential.

#### 3 Good

The aims of the Unit in terms of research are meaningful, and they show a level of scientific ambitiousness that is at a good level. The Unit's planned actions to reach their aims are quite feasible. The Unit shows good future potential.

#### 2 Satisfactory

The aims of the Unit in terms of research are adequate, and they show some scientific ambitiousness. The Unit has planned actions to reach their aims. The Unit's future potential is Satisfactory

#### 1 Weak

The Unit's potential falls below the levels described above.

# ASSESSMENT CRITERIA FOR SOCIETY PANEL

## 1. Implementation of the Assessment

The units of the Faculties act as Units of Assessment (UoA). The unit structure within the Faculties is somewhat rigid and does not fully represent the organization of research. The units are multidisciplinary, and research groups and centres within units could belong to different assessment panels. In the absence of a perfect unit of assessment, Faculty units are considered optimal in the context of this assessment as they cover all of the university's research activity and they support implementing conclusions made based on the results as existing organizational units before and after the assessment.

The assessment period is short, as Tampere University only started operating in 2019. This means that the time period for the background material concerning the UoAs (i.e. information on members of the UoA, research output, research funding, doctoral degrees) is 2019-2021. Most of the publication analyses cover only the years 2019-2020, as the publication data is not yet fully complete for the year 2021. However, a tentative trend analysis on publishing productivity including also publications from the year 2021 will be compiled to provide a preliminary look at the more recent developments in UoAs' publishing productivity.

It should be noted that due to the short time period, background material should not be given too much emphasis in the assessment. The primary assessment material is the self-assessment report submitted by the UoAs. The assessment materials only include the research performance of those members of the UoAs who were employed by Tampere University on the Census date, 1 October 2021.

## 2. Assessment criteria

The panel is asked to present a written statement and a numerical rating of each assessment criteria (discussed in sections 2.1.-2.5. below). Please note, that the numerical rating represents the level of the whole UoA but it is possible to highlight parts of the UoA in the written statement if they considerably differ from the overall rating. In addition, the panel is asked to summarize its views on the units being assessed, as well as the assessment process in general. The report will be written on the assessment form.

The assessment criteria discussed in sections 2.1.-2.3. below (scientific quality, scientific impact and societal impact) apply to the introduction of the unit's research activities (section 1 in the self-assessment report).

### 2.1. Scientific quality

For this criterion the panel assesses the novelty, originality, significance, scientific rigour, and scientific ambitiousness of the research conducted in the unit.

The numerical rating scale:

5 Outstanding

The research of the Unit is of world leading quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness.

4 Excellent

The research of the Unit is internationally recognized and of excellent quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness.

3 Good

The research of the Unit is of good quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness.

2 Satisfactory

The research of the Unit is of satisfactory quality in terms of novelty, originality, significance, scientific rigour and scientific ambitiousness.

1 Weak

The research of the Unit falls below the quality levels described above.

*2.2. Scientific impact*

For this criterion the panel assesses the significance of the research conducted in the unit and its contribution to the scientific community.

The numerical rating scale:

5 Outstanding

The research of the Unit is leading or at the forefront of the research area. It attracts great interest in the global academic community, and it has a major influence on a research theme or area.

4 Excellent

The research of the Unit attracts wide interest in the academic community. It makes significant contributions to a research theme or area.

3 Good

The research of the Unit attracts attention in the academic community. It provides useful knowledge and has an influence on a research theme or area.

2 Satisfactory

The research of the Unit attracts some attention in the academic community. It is useful and has a minor influence on a research theme or area.



### 1 Weak

The research of the Unit has limited scientific impact in its research areas.

### 2.3. Societal impact

For this criterion the panel assesses the reach and significance of the research conducted in the unit in terms of society at large as well as its relevance and if it contributes to producing new knowledge or solutions or increasing understanding on different phenomena. The panel should also consider how results are disseminated and how well the unit is engaged with stakeholder networks.

Please note that it is possible to reach the highest rating with local, national and/or international relevance.

#### The numerical rating scale:

### 5 Outstanding

The research of the Unit is outstanding in terms of reach and significance. The research is highly relevant and provides new knowledge and solutions that significantly benefit the society at large, and profoundly increases understanding on different phenomena.

### 4 Excellent

The research of the Unit is excellent in terms of reach and significance. The research is relevant and provides new knowledge and solutions that benefit the society at large, and increases understanding on different phenomena.

### 3 Good

The research of the Unit is good in terms of reach and significance. The research is useful and it has influence on the society at large.

### 2 Satisfactory

The research of the Unit is satisfactory in terms of reach and significance. The research results can be useful and it has some societal influence.

### 1 Weak

The research of the Unit has limited societal influence.

In accordance with Tampere University's strategy and values, interdisciplinarity and multidisciplinary, open science, societal interaction and internationality are considered as important elements of scientific quality, and scientific and societal impact. Therefore, the panel is also asked to examine the role of these elements in the unit's research activities, and how they support the scientific quality and scientific and societal impact of the research conducted at the unit.

#### 2.4. Unit as a research environment

In assessing the unit as a research environment, the panel should consider if the unit has sufficient infrastructure, if the personnel structure supports conducting quality research, if the funding structure is well-balanced, if the unit is international in terms of recruiting, networking and collaboration, if the mobility and networking (national and international) are relevant, and if there are enough early career researchers to ensure continuity of its fields.

##### The numerical rating scale:

##### 5 Outstanding

The research environment of the Unit is fully comparable to the leading international units in the field in terms of infrastructure, personnel structure and research funding. The Unit's national and international collaboration, mobility, networking, and recruiting are active and highly relevant.

##### 4 Excellent

The research environment of the Unit compares well to the best international units in the field in terms of infrastructure, personnel structure and research funding. The Unit's national and international collaboration, mobility, networking, and recruiting are active and relevant.

##### 3 Good

The research environment of the Unit is good in terms of infrastructure, personnel structure and research funding. The Unit makes good use of national and international collaboration, mobility, networking, and recruiting.

##### 2 Satisfactory

The research environment of the Unit is adequate in terms of infrastructure, personnel structure or research funding. The Unit has national and international collaboration, mobility, networking, and recruiting.

##### 1 Weak

The research environment of the Unit falls below the levels described above.

#### 2.5. Potential of the unit

In assessing the potential of the unit, the panel should consider the significance and the level of ambitiousness of the unit's aims in research and how relevant, reasonable and feasible are the planned actions to reach those aims.

##### The numerical rating scale:

##### 5 Outstanding

The aims of the Unit in terms of research are highly significant and they show a level of scientific ambitiousness that is at an outstanding level. The Unit's planned actions to reach their aims are feasible. The Unit shows great future potential.

##### 4 Excellent

The aims of the Unit in terms of research are significant, and they show a level of scientific ambitiousness that is at an excellent level. The Unit's planned actions to reach their aims are feasible. The Unit shows very good future potential.

### 3 Good

The aims of the Unit in terms of research are meaningful, and they show a level of scientific ambitiousness that is at a good level. The Unit's planned actions to reach their aims are quite feasible. The Unit shows good future potential.

### 2 Satisfactory

The aims of the Unit in terms of research are adequate, and they show some scientific ambitiousness. The Unit has planned actions to reach their aims. The Unit's future potential is Satisfactory

### 1 Weak

The Unit's potential falls below the levels described above.

## Appendix 1. General principles for monitoring and evaluating research in Tampere University Approved by the Academic Board on 20 October 2020

The principal aim of all research activity should be to undertake internationally outstanding work that has significant scientific and/or societal (cultural, economic, social or technological) impact. Research is inherently dynamic, with focus areas and initiatives changing over time. Tampere University research evaluations aim to provide information useful for advancing the high quality and impact of research. Information gained through evaluation is used for setting strategic goals and monitoring progress towards those goals, as well as supporting institutional development and decision-making. The university also has a duty of accountability to external stakeholders.

Research at Tampere University is extremely diverse in terms of disciplines, methods and research cultures. Accordingly, the rationale and form of each research evaluation will be decided on a case-by-case basis. The evaluation system must be reliable and trustworthy. Hence, all research evaluations will be designed and conducted following national and international guidelines on responsible evaluation. In addition, the university has its own principles regarding the evaluation of research. These principles take into consideration the university's strategic aims.

It is critical to ensure that evaluation approaches keep up with the inherently dynamic nature of research and that they are in line with the university's strategy. After each evaluation, the chosen approach will be evaluated regarding how well the evaluation reached its aim of providing information that is useful for institutional development and decision-making, setting of strategic goals, and monitoring progress towards those goals. Evaluation approaches will be developed accordingly.

The evaluation process involves both monitoring – collecting appropriate data and reflecting on research activity, and periodic evaluation – a more formal process that takes a 'snapshot' of the current state of research.

Monitoring is needed mostly to support faculties, research units and individual researchers in their self-reflection, ongoing decision-making and facilitation of research activity. Monitoring helps make activity visible, and it is best undertaken as a continuous process – this both aids continuous reflection and will also alleviate the burdens of periodic evaluations.

Tampere University is a multidisciplinary university; it is therefore essential that differences in scientific fields are recognized and taken into consideration in evaluation. With regards to monitoring, this means that differences in aims and indicators must be accepted.

This proposal does not consider the evaluation of individual researchers. For evaluating individual researchers, Tampere University will commit to the national guidelines.

1. Evaluations advance high-quality science and research. Evaluations help the University to develop its preconditions for doing research for the betterment of high-quality and impactful science.
2. Evaluation systems must reflect the diversity of different disciplinary needs and approaches. There is no single method or indicator available for Tampere University, so a diversity of methodology and indicators must be allowed. There should be customized aims for units under evaluation (e.g. faculties) and thereby tailored indicators. We should follow the 'one size does not fit all' principle.
3. Evaluation should reflect accountability. The university is in partnership with society, which funds its research. As such, the university should demonstrate that the funds are used to the benefit of society and science. Evaluation should reveal how we interact with wider society and our level of integration. In our research we must also be accountable to the scientific community, and evaluation should reveal the level of our scientific impact and the quality of our research.
4. Focus on all dimensions of scientific productivity. Inputs (resources – such as time or funding) and outputs (tangible results – such as publications) of the research process are more readily quantifiable, and they tell us something about efficiency (that is, the relationship between inputs and outputs). The scientific quality as well as scientific and societal impact of research are harder to measure. In order to gain a comprehensive picture of the target of evaluation, the different dimensions of scientific productivity as well as the relationships between them must be taken into account.
5. Judgement will always be involved. When using quantitative indicators as data inputs it is important to keep in mind that the interpretation of metrics involves judgement. Both qualitative and quantitative information is needed, as well as rigorous and robust systems for reaching fair judgements. Fair judgements require appropriate and transparent processes as well as resources to make sure we are gathering relevant information and using that information responsibly.
6. Evaluation should promote the consideration of impact as an integral part of the research process, rather than only as an act of measurement in the assessment phase. Evaluation of impact involves recognition of a wide variety of research-related activities. Care should be taken to avoid the collection of such data being onerous.
7. Evaluation should also consider the quality of the university's research environment as a site for research work. Evaluation should reveal the quality of the university as an institution in facilitating and promoting research activity. This might include practical support arrangements, the availability of appropriate infrastructure, staffing and staff development/rewards, and general culture.
8. Evaluation should be cost-effective. Evaluation regimes should not place undue burdens and stress on researchers; evaluations should be enabling, not judgmental. The workload of any evaluation should be proportional to the aims and anticipated outcomes of the evaluation. Evaluative processes need to be mindful of the needs for data – how it will be collected, at what cost, and the accuracy and robustness of existing data.

## Appendix 2. Members and duties of the TAU RAE external Steering Group

### Members of the Steering Group

Vice-Rector Paula Eerola, University of Helsinki, Chair

Provost Kristiina Mäkelä, Aalto University

Professor Risto Renkonen, University of Helsinki

Professor Anssi Paasi, University of Oulu

Provost Jarmo Takala, Tampere University

Secretary

Project Leader Laura Himanen ([laura.himanen@tuni.fi](mailto:laura.himanen@tuni.fi), +358 50 3310 103)

### Duties of the Steering Group

- Approving the Terms of Reference document defining the aims, criteria and implementation of the assessment
- Approving panels
- Giving overall guidance on the evaluation



**Tampere University Research Assessment Exercise 2022**

**TAU RAE 2022**

**Terms of Reference for the Second Stage**

## 1. Introduction

Tampere University conducts its first comprehensive external and international research assessment in 2022 (TAU RAE 2022). The assessment takes place in two stages. In the first stage, taking place 13–17 June, research conducted at Tampere University is assessed in three panels: technology, health and society. The units of the Faculties act as Units of Assessment (UoA). The panels will assess 1) the scientific quality and scientific and societal impact of the research conducted at the UoAs, 2) the UoAs as research environments, and 3) the future potential of the UoAs.

In the second stage, taking place in October 2022, the Chairs of the three panels are invited to discuss the University as a site for conducting quality research with the members of the TAU RAE 2022 external Steering Group and Tampere University senior management.

## 2. Background of the second stage

In accordance with Tampere University's general principles for monitoring and evaluating research, evaluation should also consider the quality of the university's research environment as a site for research work. Evaluation should reveal the quality of the university as an institution in facilitating and promoting research activity. As the first stage of TAU RAE 2022 focuses on the research activities and environments of the Units of Assessment, a second stage focusing on the university level is needed.

In the second stage, the assessment results of the first stage are reflected in terms of their implications for university-level developments, and in addition the existing strategic instruments, designed to support the conducting of high-quality research, are discussed.

Tampere University's strategic aims and actions for research are as follows:

- Improving the scientific quality of research through
  - undergoing external assessments to identify and support world-class research activities,
  - integrating the principles of open and responsible science into our organizational culture, and
  - investing in research infrastructures and making them openly available
- Basing collaborations on a combination of disciplines with a focus on technology, health and society through
  - enabling that new knowledge stemming from our basic research efforts will allow us to tackle climate change, preserve the natural environment and improve the well-being and sustainability of societies.
  - launching 4-5 four-year research platforms that transcend disciplinary boundaries.
  - offering seed funding to the research platforms to support the planning and initiating of research projects in collaboration with international research groups and partners who will apply the research results in practice.
- Diversifying our research funding base and making special effort to secure more EU funding through



- improving the quality of grant proposals and actively seeking the role of coordinator in collaborative projects, and
  - increasingly seeking to influence the EU's research funding policies.
- Appreciating our people as our greatest asset in the pursuit of excellence in research, and, therefore
  - help our researchers expand their competencies at the beginning and throughout their careers.
- Maintaining close ties with external stakeholders and the broader society through
  - involving companies and stakeholders in different stages of research processes, and
  - maintaining research environments that facilitate collaboration between the University and private and public organizations.

Strategic instruments to achieve our aims are as follows:

1. Researcher's career path
2. Research environment and strategic funding
3. Collaboration and interaction

For more detailed information on the strategic instruments, please see section 4.1. below.

### **3. Objectives of the second stage**

The purpose of the second stage is twofold. First to reflect on the observations made by the assessment panels in the first stage, in terms of what implications they might have for the university-level. And second to discuss whether existing strategic instruments support the conducting of high-quality research.

The aim of the second stage is to provide information to support university-level leadership and decision-making in terms of prioritization and resourcing.

The results of the second stage will be utilized in reshaping university strategy.

### **4. Implementation of the second stage**

The second stage of TAU RAE 2022 is organized as a round table discussion in Tampere taking place 27-28 October. The President of Tampere University acts as the Chair.

The second stage and its organization are funded by Tampere University, which will pay expert fees to all external parties as well as reimburse all the travel and accommodation expenses relating to the visit.

The second stage discussion is based on Tampere University's preliminary ideas regarding the university-level implications of the assessment results received from the three panel and detailed information on the existing strategic instruments designed to support the conducting of high-quality research. All the pertaining material will be provided to the participants a minimum of two weeks before the visit. In addition, the panel Chairs are invited to bring up all issues relevant for university-level discussions based on the insights gained during the first stage site visit in June.

#### 4.1. *Strategic instruments*

Tampere University uses selected strategic instruments to achieve its aims. In the material provided to the participants before the visit all instruments listed below will be presented in more detail.

1. Researcher's career path  
Issues to be discussed: recruitment, researcher development, mobility, Doctoral School,
2. Research environment and strategic funding  
Issues to be discussed: research support, research infrastructure, fostering excellence initiatives (Centres of Excellence, ERC, Academy of Finland Flagship Programme), Tampere Institute for Advanced Study
3. Collaboration and interaction  
Issues to be discussed: multi- and interdisciplinary cooperation, profiling actions, research platforms

#### 4.2. *The task of the Panel Chairs*

The second stage of TAU RAE 2022 is developmental in nature, and it is geared firmly towards the future. The aim is to provide information to support university-level leadership and decision-making and the participants are invited to reflect on the university's foci in strategic development.

Based on the discussions, the Panel Chairs are asked to write a joint introduction including university-level recommendations to be published as part of the final report summarizing all results of Tampere University Research Assessment Exercise 2022.

### 5. Confidentiality

The participants external to Tampere University agree to refrain from making use and/or divulging to third parties any non-public material, facts, information, documents or other matters brought to their attention during the second stage of the Research Assessment Exercise. The final report produced by Tampere University is the main instrument for communicating the results of the Research Assessment Exercise.