

ONDERZOEKERIJ

Master's programme
Science and Innovation
Utrecht University

Report of the limited programme assessment

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Executive summary

The outcome of the external assessment of the master's programme Science and Innovation (S&I) of Utrecht University by an NVAO-approved panel is positive.

The interdisciplinary S&I programme aims to educate students to become academic professionals who can behave as change agents in businesses and societal organisations as well as contribute to shaping innovation systems that address societal challenges. The panel values the embedding of S&I in the Copernicus Institute, a well-known research institute.

The intended learning outcomes reflect the Dublin descriptors for master's programmes as well as the academic level. To position itself more distinctively within the domain, the panel encourages the programme to further solidify its own profile.

Within its overarching goal, the programme consists of two separate specialisations, Innovation Science (IS) and Sustainable Business and Innovation (SBI), organised in separate curricula with little overlap. Given the programme's goal to prepare students to address societal challenges with innovation in an interdisciplinary environment, the panel thinks that the programme could profit from more cross-fertilisation between the specialisations.

The two-year full-time programme (120 EC) entails a mix of courses on theory, methods, and integration. In the first year of courses, students are trained in using theories and methods in the context of their specialisation and in applying these to societal challenges in integration courses. In the second year, students follow an individual trajectory dedicated to their interests and ambitions, which includes a 45 EC master's thesis project and elective courses (15 EC). According to the panel, the curriculum is coherent, feasible and sufficiently flexible, offering students plenty of opportunities to shape their own learning trajectory. The panel appreciates the student's training in providing clear and critical analyses, scientifically sound argumentation, and practical strategies for problem identification and solution.

The programme is taught by a high-quality and committed teaching staff. The panel appreciates the use of external guest speakers who add different perspectives. The programme offers students plenty of support, and students appreciate the involvement and dedication of the teaching and supporting staff.

The programme has a valid, transparent, and reliable system of assessment in place. The assessment methods are varied and fit the goals of the programme. S&I's assessment plan clearly outlines the integral execution of the examination policy and serves as a working document with ambitions and recommendations for continuous assessment improvement within the programme.

The panel is of the opinion that group work is very well suited to the small-scale and interdisciplinary character of the programme, but the panel did notice that the programme does not explicitly monitor the division of tasks among students in project groups. The panel strongly encourages the programme to monitor the division of tasks. In addition, the panel recommends implementing measures to assess the individual contribution in group assignments to reduce free riding.

Although the Board of Examiners (BoE) sufficiently safeguards the quality of assessment and thus carries out its formal tasks, it was not on top of all content and procedures of the programme. The panel encourages the programme to continue the professionalisation of the BoE and recommends introducing a more structural approach to improve the communication between the BoE and the programme.



The theses the panel studied were of good quality. Although the panel noticed differences in orientation between theses from the SBI specialisation and the IS specialisation, it is of the opinion that the theses of both specialisations meet the intended learning outcomes. Alumni find relevant positions after graduation and look back on the programme with appreciation.

The chair and the secretary of the panel hereby declare that all panel members have studied this report and that they agree with the judgements laid down in the report. They confirm that the assessment has been conducted in accordance with the requirements relating to independence.

Date: 18 January 2023

Wiebe Bijker
(chair)

Annemarie Venemans
(secretary)



1. Introduction

1.1 Administrative data

| | |
|-------------------------------|--------------------------------|
| Name of the programme: | M Science and Innovation (S&I) |
| CROHO number: | 60709 |
| Level of the programme: | Master |
| Orientation of the programme: | Academic |
| Study load: | 120 EC |
| Location: | Utrecht |
| Variant: | Full-time |
| Submission deadline: | 1 May 2023 |

1.2 Introduction

This report focuses on the assessment of the master's programme Science and Innovation (S&I). This assessment forms part of a cluster assessment of six programmes at three universities. Appendix A provides an overview of the six participating programmes.

The assessment is based on the standards and criteria described in the NVAO Assessment framework for the higher education accreditation system of the Netherlands 2018 (limited framework).

1.3 Panel composition

The panel that assessed this bachelor's programme consisted of the following members:

- Prof. Wiebe Bijker (chair), emeritus professor of Technology & Society, Maastricht University;
- Prof. Magnus Klofsten, Professor in innovation and Entrepreneurship, Linköping University, Sweden;
- Prof. Lotte Krabbenborg, Associate Professor Public participation in the development of science and technology, Radboud University;
- Dr. Pieter Heringa, Strategic advisor research policy, Hogeschool Inholland;
- Iris Brugmans MSc (student member), student M Healthcare policy innovation and management, Maastricht University.

The panel was supported by dr. Annemarie Venemans-Jellema, who acted as secretary.

All panel members and the secretary have signed a declaration of independence and confidentiality. In this declaration, they affirm not to have had any business or personal ties with the programme in question for at least five years prior to the review.

The NVAO approved the composition of the panel on 16 September 2022.



1.4 Working method

Preparation

The programme drew up a self-evaluation report describing the programme's strengths and weaknesses. This self-evaluation report included a chapter in which the students reflected on the programme. The panel members prepared the assessment by analysing the self-evaluation report and the appendices provided by the institution. The panel also studied a selection of fifteen master theses and the accompanying assessment forms from the programme. The theses selection was made by the panel's secretary based on a provided list of theses of the most recent years. In the selection, consideration was given to a variation in assessments (grades) and topics.

The panel members individually formulated their preliminary findings and several questions they want to raise during the site visit. The secretary made an overview of these preliminary findings and questions and sent these to the panel members. On 18 October 2022, the panel held an online preliminary meeting. In this meeting, the panel discussed the programme's preliminary findings and discussed the most important topics they wanted to touch upon during the site visit.

Visit

The site visit took place on 9 November 2022 (see Appendix B for the schedule). During the preparatory meeting, the panel discussed the preliminary findings and decided which questions to raise in their meetings with the programme representatives. During the visit, the panel spoke with representatives of the management, students, lecturers, alumni, and Board of Examiners about this programme and the bachelor's programme Science and Innovation Management. Everybody involved in the programme had the opportunity to inform the panel in confidence about matters they consider important to the assessment. No one made use of this opportunity. The panel used the last part of the visit to evaluate the interviews and had a second meeting with the programme's management to receive answers to any remaining questions. At the end of the visit, the chair presented the panel's preliminary findings and impressions of the programme.

Report

The secretary drew up a draft report based on the panel's findings. This draft report was presented to the members of the panel and adjusted based on their feedback. After adoption, the draft report was sent to the institution for verification of factual inaccuracies. The secretary discussed the programme's comments with the chair, after which the secretary drew up the final report and circulated it to the panel for a final round of comments.

The report follows the four standards such as set of in the NVAO's Assessment Framework 2018 (limited framework): 1) the intended learning outcomes, 2) the teaching-learning environment, 3) assessment, and 4) achieved learning outcomes. Regarding each of the standards, the assessment panel gave a substantiated judgement on a three-point scale: meets, does not meet, or partially meets the standard. The panel subsequently gave a substantiated conclusion regarding the quality of the programme, also on a three-point scale: positive, conditionally positive, or negative.



Development dialogue

Although clearly separated from the process of the programme assessment, the assessment panel members and programme representatives conduct a development dialogue, with the objective to discuss future developments of the programme considering the outcomes of the assessment report.



2. Review

2.1 Intended learning outcomes

The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

Findings, analysis, and considerations

The S&I master's programme educates students to become academic professionals who can behave as change agents in businesses and societal organisations as well as contribute to shaping innovation systems that address societal challenges. The programme emphasises that addressing societal challenges with innovation requires a combined understanding of technology and change processes on multiple levels in society. Therefore, the programme is interdisciplinary.

The programme focuses on sustainability and other innovations for societal challenges on the micro and meso level and in various areas such as energy, mobility, food, and healthcare. As described in the self-evaluation report, this distinguishes the degree programme from business schools, and management and economics programmes, in which innovation appears more as a means for firms to gain a competitive advantage.

In close collaboration with the programme directors of the affiliated programmes at Vrije Universiteit Amsterdam (VU) and the Technical University of Eindhoven (TU/e), a Domain-Specific Reference Framework was established in 2021, in which the respective bachelor's and master's programmes were included that educate students in the field of innovation sciences. The panel highly welcomes this joint effort and considers the framework to be an appropriate description of the international academic field of innovation sciences. In addition, the framework provides a good description of the programme objectives of both the bachelor's and master's programmes in this field and the requirements graduates of these programmes must meet. The panel encourages the programme to use this framework to further solidify its own profile and explicate how it differentiates itself from other innovation sciences programmes.

Within its overarching goal, the programme consists of two separate specialisations. At the start of the programme, students choose one of these specialisations and follow the associated curriculum. In the Innovation Science (IS) specialisation students learn to analyse the dynamics and challenges of innovations and the role of innovation in tackling grand societal challenges. In the Sustainable Business and Innovation (SBI) specialisation, students learn to become more sustainable in supporting businesses and other organisations. An important difference between both specialisations is that IS focuses on the understanding and management of innovation processes, mainly from a meso- and micro-perspective on society, while the SBI specialisation focuses on sustainable innovation in which business plays an important role.

The panel is positive about the programme's clear profile centred around innovation processes in business and societal organisations. The panel noted that the two specialisations are organised in separate curricula with little overlap. Given the programme's goal to prepare students to address societal challenges with innovation in an interdisciplinary environment, it thinks that the programme could profit from more cross-fertilisation between the specialisations. The panel recommends that



the programme investigate possibilities to create more shared educational components between IS and SBI to create a more interdisciplinary environment for its students.

Intended learning outcomes

The programme developed a set of intended learning outcomes (ILOs) that match this profile. The programme's ILOs are translated in ILOs per specialisation. According to the panel, the ILOs for the two specialisations are in line with the programme's profile and are well-formulated and sufficiently concrete. The ILOs clearly tie in well with the Domain-Specific Framework of Reference and reflect the Dublin descriptors for the master's level. The panel finds that the orientation is clearly academic, but that also sufficient attention is paid to preparing students for the professional labour market. This professional orientation is reflected in its focus on interdisciplinary skills to understand how societal challenges can be better understood and solved using different theoretical perspectives.

Conclusion

The panel concludes that the ILOs are well described in terms of level and orientation. The programme, therefore, meets standard 1.

2.2 Teaching-learning environment

The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

Findings, analysis, and considerations

Curriculum

The two-year fulltime programme (120 EC) entails a mix of courses on theory, on methods, and on integration. In the first year, students are trained in using theories and methods in the context of their specialisation and in applying these to societal challenges in integration courses. In the second year, students follow an individual trajectory dedicated to their interests and ambitions, which includes a 45 EC master's thesis project and elective courses (15 EC). A complete outline of the curriculum can be found in Appendix E.

The panel studied the curriculum and its content. The panel considers the curriculum setup and content to be well-designed. It considers the curriculum coherent, feasible and sufficiently flexible, offering students plenty of opportunity to shape their own learning trajectory.

In the first year, both specialisations consist of three theory courses, of which the course *Innovation Management* is the same course for both specialisations. For IS, the theory courses focus on expanding students' knowledge of relevant theories in innovation studies and on the skills needed to apply these theories to innovation problems encountered in practice. During the SBI theory courses, students become familiar with sustainable challenges and potential technological solutions, as well as with the most important theories of business and innovation.



In addition to the theory courses, both specialisations have a different set of method courses. In these courses, students expand their knowledge, skills, and experience concerning methodologies relevant to innovation research (IS) or sustainable business research (SBI).

At the end of the first year, students of both specialisations participate in the *Consultancy Project*. In the *Consultancy Project*, students work on real-life cases and learn to develop and apply professional skills, such as networking, working in teams, and presenting for a non-academic audience. In the course, groups of students carry out scientific research for an organisation such as a company, or a governmental or non-governmental organisation, in which they apply their knowledge and skills to provide robust advice to the organisation. According to the students, this course is a useful way to become acquainted with the working field and to explore what they can bring to a company with the knowledge they have obtained.

The elective courses in the second year allow students to specialise in a field of their interest, possibly related to their thesis topic. The electives need to be at master's level and relevant to the specialisation of the student. The self-evaluation report states that some students have difficulties choosing electives. Therefore, the panel welcomes the programme's plan to provide students with more structured information on the electives that they can choose.

Students apply their acquired knowledge and skills independently in conducting their own research during their master's thesis. This empirical research project needs to have both theoretical and societal relevance and needs to adhere to academic and ethical standards. A staff member holding a PhD degree supervises the student in developing and executing her/his thesis project. Depending on the supervisor's expertise and the student's interests, the thesis may focus more on natural or on social sciences and may include an in-depth description of a technology or sector.

Completing an internship during the master's thesis is optional but recommended. In practice, combining a thesis with an internship is relatively common for SBI students, while it is less common for IS students. The panel considers these internships valuable experiences for students. The students with whom the panel spoke during the site visit were positive about their internships but believed that more practical information (for example where to find an internship) would be helpful.

Based on the self-evaluation report and interviews with students and staff, the panel estimated that there are many differences between the two specialisations, such as different admission criteria, different courses, and (partly) different teachers. The previous accreditation panel recommended exchanging best practices among the specialisations of the programme and considering increasing the overlap between the specialisations. In response to this, the programme has developed two shared courses. However, the students who wrote the student chapter and the students the panel met during the site visit considered the IS and SBI programmes as two separate master's programmes. The panel encourages the programme to further converge the two specialisations as would be appropriate to one interdisciplinary master's programme.

The panel appreciates the programme's attention dedicated to practice-based skills and orientation towards application. Almost all mandatory courses include guest lectures, and students primarily work with real-life problems and case studies.

According to the panel, the student's ability to reflect critically upon the roles of science and technology in society is very important in this master's programme. During the site visit, the panel extensively deliberated with students and staff about the focus on critical thinking throughout the programme. The panel is of the opinion that students are well-trained to provide clear and critical analyses, scientifically sound argumentation, and practical strategies for problem identification and



solution. Students with whom the panel spoke explained that critical thinking is a common thread throughout the curriculum, both in the theoretical courses and the *Consultancy Project*.

The programme is offered in English. The panel considers the choice for the use of English to be well-motivated. An English-language programme prepares students for an internationally oriented field. In addition, the programme management substantiates its choice by arguing that English allows the programme to enrol an international student population. The panel endorses this.

Learning environment

In line with the UU educational concept, the programme offers students a personal and activating learning environment. The courses combine lectures with small-group tutorials, assignments, group discussions, and projects based on real-life cases. According to the end-of-year evaluations, students value collaboration in small groups. The panel is of the opinion that group work is very well suited to the small-scale and interdisciplinary character of the programme, as it allows students from diverse backgrounds to contribute to interdisciplinary challenges and learn from each other.

However, the panel is of the opinion that group work does not guarantee that students gain all academic skills. The panel did notice that the programme does not explicitly monitor the division of tasks in project groups. According to the panel, this could lead to 'specialisation', where students practice skills that they are already good at rather than those that they still need to develop. The panel advises the programme to better direct and monitor this division of tasks.

According to the self-evaluation report, the increasing number of students puts pressure on the small-scale approach to teaching. During the site visit, the panel was pleased to hear that the UU used government quality funds ('studievoorschotmiddelen') to invest in additional teaching hours, enabling lecturers to maintain the small-scale approach, including providing personalised feedback.

Admission

S&I strives for a diverse inflow of students to expose students, also in their student-group discussions, to a wide variety of perspectives. The number of students starting the programme is about 35 students per year for the IS specialisation and about 80 students per year for the SBI specialisation. Around one-quarter of the master's students come from the UU bachelor's programmes *Science and Innovation Management* and *Global Sustainability Science*, while three-quarters come from a broad range of other programmes, mainly in natural sciences and engineering and the life and environmental sciences. Of all incoming students, a small percentage (on average 11%) are graduates of universities of applied sciences and from international universities.

The S&I master's programme is open to students with an academic bachelor's degree who can demonstrate a high level of knowledge, motivation and command of relevant methods and skills in the field. For SBI students these requirements are a basic level of academic knowledge in natural sciences and general insights into sustainability issues and innovation. For IS students an interest in novel technologies and innovation and an interest in complex multidisciplinary societal challenges, are required. Other admission criteria are English-language proficiency, research skills, motivation, and study results. An admissions committee reviews all requests for admission and selects students that meet the entry requirements. The panel is positive about this sophisticated admission procedure, which carefully looks for a good match between prospective students and programme.



Staff

The programme is taught by a multidisciplinary teaching staff originating from the Copernicus Institute. The teaching staff members all hold a doctorate degree and are active researchers. The panel acknowledges the staff's excellent international academic reputation. It is of the opinion that excellent research contributes to the relevance of the programme and offers students optimum opportunities to get to know the scientific professional field.

All courses are coordinated by a tenured staff member with a relevant PhD and University Teaching Qualification (UTQ). 61% of the staff is tenured. In addition to tenured teaching staff the programme benefits from a group of junior lecturers, junior researchers, and junior assistant professors (39%), who are involved in teaching (mostly tutorials, in some cases, also lectures) and supporting course organisation and improvement. The Copernicus Institute expects temporary teaching staff to take part in the new university-wide 'Start to teach' programme and in the UTQ trajectory.

The panel has met with a team of S&I lecturers. It is clear to the panel that students are part of a high-quality and committed teaching and research environment. In addition, students were very pleased with the involvement of staff members. According to the students, there is always a lot of interaction between staff and students. Guest lecturers are appreciated because they add different perspectives and bring much value to specific topics.

During the site visit, the panel discussed the workload related to growing student numbers with the programme. The panel was pleased to hear that the programme has used part of the quality funds to recruit additional teaching staff to keep the workload manageable.

Study load and study guidance/mentoring

The programme management indicated that due to its interdisciplinary nature, the master's programme is of interest to students with various levels of background knowledge relating to the topics of science and innovation, in particular to students with a natural science background and students entering from the UU bachelor's programmes Science and Innovation Management and Global Sustainability Science. The panel is positive about the possibility for both types of students to enrol, adding to the diverse set-up of the programme, and is positive about the pre-master that is in place to remedy their deficiencies.

The students are in general satisfied with the programme's feasibility. Although sometimes difficulties arise when lecturers are required to make their lectures both understandable and challenging, most students and lecturers noted during the site visit that the differences in level between students with various backgrounds usually disappear in the second semester. The panel encourages the programme to continue monitoring its feasibility for students with different backgrounds.

The students are supported by the teaching staff and the study advisor. The study advisor is the first point of contact for individual questions and problems regarding various situations, such as study delay, study planning and progress, changing or discontinuing their study programme, electives and studying abroad. The students and alumni interviewed by the panel praised the good atmosphere among staff and students, the dedication of the teaching and supporting staff, and the help they got when struggling with personal problems or choices, especially during the corona period.

Students receive their information in various places, most notably through computer-supported communication channels, such as the MyTimetable app and the e-learning platform Blackboard. In addition, students have an account to access Osiris to view their grades and study progress, and to enrol in courses. The panel found this documentation accessible.



Conclusion

The panel concludes that the programme fulfils all specific requirements for the teaching and learning environment of a master's programme and therefore meets standard 2.

2.3 Student assessment

The programme has an adequate system of student assessment in place.

*Findings, analysis, and considerations**Assessment system*

The system of student assessment for the S&I programme is based on the UU policy regarding the organisation of assessments. The rules for testing and assessment are set out in the Teaching and Examination Regulations and the Rules and Guidelines of the Board of Examiners (BoE). The previous accreditation committee recommended the programme to draft a comprehensive assessment matrix which relates the goals, contents, and examinations of each course. The programme has developed an assessment plan in which this matrix is outlined. According to the panel, the assessment matrix in the Assessment Plan shows that the assessment is aligned with the ILOs of the programme.

The S&I's Assessment Plan identifies some principles for assessment, such as 1) there is a clear relationship between the programme's ILOs, course learning objectives and the chosen assessment methods and forms per course; 2) both summative assessments and formative assessments will be used; and 3) the assessments are valid, reliable, and transparent. According to the panel, the Assessment Plan clearly outlines the integral execution of the examination policy for the S&I programme on a curriculum as well as on a course level.

The panel is positive about the multiple types of assessment the programme uses to best assess the different course objectives. Types of assessment are for example written exams, research papers, written assignments, and oral presentations or pitches. The panel understood from the materials and the discussions that the programme has a policy of continuous assessment to activate students' learning behaviour, monitor students, and give them feedback on their achievement of the course's ILOs. In practice, this means that for every course there are between three and seven assessment methods. In addition to the summative assessment, several modes of formative assessments are applied, including formative feedback on draft papers and assignments and peer feedback.

The panel noted that there is one course that is fully based on group assessment (the *Consultancy Project*) and that two courses are fully based on individual assessment (the IS course *Societal Challenges and Innovation Theory* and the *master's thesis*). For the remaining courses, the final grade is a mix of individual and group assessment: ranging from 15% individual assessment to 80% individual assessment.

The *Consultancy Project* is intended to revolve around group work leading to developing and applying professional skills. Therefore, the panel understands that a group assignment for this course is a logical choice. However, the panel recommends that the proportion of group assessment of all other courses should be brought down to 50% or lower.

The panel extensively deliberated with management, staff, students, and the BoE about the grading of group assignments. The previous accreditation committee recommended better identifying the



individual results in group assignments. Since the last accreditation, the programme has made progress towards discussing this topic with course coordinators and during regular lunch meetings. However, as stated in the self-evaluation report, the programme didn't implement methods to assess individual contributions to group work yet. The panel strongly recommends implementing measures to assess the individual contribution in group assignments to reduce free riding.

Grading of the theses

This final product is in the form of a written thesis (70%), an oral presentation (10%) and an evaluation of the overall thesis process (20%). The supervisor and a second reader independently assess the research proposal, the presentation, and the final thesis using a structured rubric, which is based on the ILOs. To pass the course, the grade for the written thesis must be at least 5.50 and the weighted average of the grades for the thesis process and presentation has to be sufficient (≥ 5.50).

The panel has reviewed a sample of fifteen master's theses, including the assessment forms. In general, the panel is positive about the current thesis grading procedure. It appreciates the rubric form with relatively detailed qualitative remarks and feedback by the assessors. One point of attention is how the grading of the various aspects defined in the rubric determines the final grading. It suggests the programme to make more transparent for students how the different aspects of the thesis quality led to the final grade.

Board of Examiners

The BoE of the Undergraduate School of Geosciences and the Graduate School of Geosciences is responsible for the quality of the examinations. The BoE consists of one central BoE and three chambers. The faculty-wide Committee of Assessments (Toetscommissie) is – as a subcommittee of the BoE – jointly responsible for securing the quality of assessment in the programmes of the Faculty of Geosciences.

The BoE ensures the quality of the programmes and awards degrees to the students. The Committee of Assessments independently evaluates the quality of a selected subset of examinations including theses and advises the BoE. The selection is partly random and partly based on lecturer and/or student evaluations.

The panel concludes that the BoE sufficiently safeguards the quality of assessment and thus carries out its formal tasks. Nevertheless, the panel thinks there is room for improvement. The panel observed that the BoE was not on top of all content and procedures in the programme. In addition, the panel noted that communication between the BoE and the programme could be improved. For example, the BoE didn't know if their recommendations based on thesis evaluations were implemented in the programme.

The panel understood from the programme management that there have been many personnel changes in the BoE and that much work is now being done to bring knowledge back into the board. The panel encourages the programme to continue this professionalisation of the BoE and recommends introducing a more structural approach to improve the communication between BoE and the programme.



Conclusion

The panel concludes that S&I has an adequate assessment system. The programme, therefore, meets standard 3.

2.4 Achieved learning outcomes

The programme demonstrates that the intended learning outcomes are achieved.

Findings, analysis, and considerations

The students demonstrate that they have achieved the ILOs through a master's thesis (45 EC) in which they individually demonstrate their academic knowledge and ability to conduct research with limited supervision.

To establish whether students achieve the end qualifications, the assessment committee has reviewed a sample of fifteen master's theses. In the run-up to the site visit, the programme management provided an overview of the theses that were submitted in the academic years 2019 - 2020 and 2020-2021. The secretary selected the theses to be reviewed ensuring a fair distribution across scores, specialisation, and year of submission.

The theses the panel studied were of very good quality. The subjects of the theses are timely and relevant. The panel appreciated the scientific and societal relevance of the theses and the student's personal reflections regarding the outcomes of the theses. According to the panel, the students have demonstrated broad knowledge and understanding in the innovation area, in-depth knowledge in certain parts of this area, and in-depth insight into current research and development work. The panel appreciates the fact that more than twenty scientific publications were based on students' master's theses during the evaluation period.

In general, master's theses of IS students have a focus on theory-intensive topics, whereas the master's theses of SBI students on average deal more with application-oriented content. Although the panel noticed this difference in orientation between theses from the SBI specialisation and the IS specialisation, it is of the opinion that the theses of both specialisations meet the ILOs.

In addition to verifying the quality of the final qualifications, the labour market performance of graduates is another way to establish whether students achieve the ILOs upon completion of the programme. The panel noted that students find employment in PhD positions in the Netherlands and abroad, as well as in industry, policy, the public sector, or business.

During the site visit, the panel talked to a diverse group of alumni. They indicated that they were well prepared by the programme for their current positions.

After reading the theses and speaking to alumni of the master's programme, the panel concluded that graduates demonstrated that they had met the ILOs at the expected level.

Conclusion

The panel concludes that students of the programme achieve an adequate final level and find suitable jobs. The programme, therefore, meets standard 4.



3. Strengths and recommendations

3.1 Strengths of the programme

The panel is impressed by the following features:

- Curriculum structure – The programme has a core structure as well as elective courses, which gives students ample opportunity to tailor the programme to their own interests;
- Teaching team – The teaching staff is dedicated and well-qualified. Staff members are experts in their respective areas, bringing in the latest developments in their field;
- Research environment – The programme is taught at the Copernicus Institute, known as a top-class research institute.
- High-quality end products – The overall academic quality of the studied theses is very high, demonstrated by the scientific and societal relevance of the theses and the student's personal reflections regarding the outcomes.

3.2 Recommendations

For further improvement of the programme, the panel makes the following recommendations:

- Specialisations - further converge the two specialisations to create a more interdisciplinary environment for its students
- Profile - Solidify the programme's profile to establish a stronger, more distinctive profile in the domain;
- Group work – Bring down the proportion of group assessment of courses (except the *Consultancy Project*) to 50% or lower and implement measures to assess the individual contribution in group assignments;
- Board of Examiners – Continue the professionalisation of the BoE and introduce a more structural approach to the communication between the BoE and the programme;



4. Conclusion

The panel has found that the ILOs (standard 1), the teaching-learning environment (standard 2), the assessment system (standard 3) and the achieved learning outcomes (standard 4) meet the criteria.

The ILOs reflect the programme's aims and vision and are in line with the discipline and international requirements. The curriculum, the teaching methods, the quality of the teaching staff and the assessment system enable the incoming students to achieve the ILOs.

| Standard | Judgement |
|------------|--------------------|
| Standard 1 | Meets the standard |
| Standard 2 | Meets the standard |
| Standard 3 | Meets the standard |
| Standard 4 | Meets the standard |
| Conclusion | Positive |



Appendix A – Programmes of the cluster

The cluster Innovation Sciences consists of six programmes:

| | | |
|-------|---|------------------------------------|
| 56265 | B Technische Innovatiewetenschappen | Eindhoven University of Technology |
| 66265 | M Innovation Sciences | Eindhoven University of Technology |
| 56982 | B Natuurwetenschap en Innovatiemanagement | Utrecht University |
| 60709 | M Science and Innovation | Utrecht University |
| 50670 | B Science, Business & Innovation | Vrije Universiteit Amsterdam |
| 69320 | M Science, Business and Innovation, | Vrije Universiteit Amsterdam |



Appendix B – Schedule of the visit

9 November, 2022

| Time | Session |
|---------------|--|
| 08.30 – 09.30 | Preparatory meeting and reviewing documents |
| 09.30 – 10.15 | Vice-dean and programme management |
| 10.30 – 11.00 | Bachelor students and members education committee |
| 11.00 – 11.30 | Master students and members education committee |
| 11.45 – 12.15 | Board of Examiners |
| 12.15 – 13.15 | Lunch |
| 13.15 – 14.15 | Lecturers, theses examiners and study advisors |
| 14.30 – 15.15 | Alumni and professional field representatives (online) |
| 15.45 – 16.15 | Programme management |
| 16.15 – 17.30 | Deliberations panel |
| 17.30 – 18.00 | Presentation of first findings |



Appendix C – Documents studied

- Self-evaluation report with appendices
 - Appendix 1: Organisation of the S&I Master's Degree Programme
 - Appendix 2: Domain-specific framework of reference Innovation Sciences
 - Appendix 3: Overview of the intended learning outcomes in relation to the Dublin descriptors and the Domain specific framework of reference
 - Appendix 4: Members of the Advisory Board of the Copernicus Institute of Sustainable Development
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 - Appendix 20: Pre-approved electives 2021-2022
- Fifteen theses with assessment forms
- Examples course manuals
- Examples of exams and answer models
- Assessment plan
- Annual report Board of Examiners



Appendix D – Abbreviations

| | |
|------|---|
| BoE | Board of Examiners |
| EC | European Credit |
| ILO | Intended Learning Outcome |
| IS | Innovation Sciences |
| NVAO | <i>Nederlands-Vlaamse Accreditatieorganisatie</i> |
| S&I | Science & Innovation |
| SBI | Sustainable Business Innovation |
| TER | Teaching and Examination Regulation |
| UTQ | University Teaching Qualification |
| UU | Utrecht University |



Appendix E – Outline of the programme

