NVAO • THE NETHERLANDS

INITIAL ACCREDITATION

ACADEMIC MASTER
VOICE TECHNOLOGY
University of Groningen

SUMMARY REPORT
23 November 2020

1 Peer Review

The quality of a new programme is assessed by means of peer review. A panel of independent peers including a student reviews the plans during a site visit to the institution. A discussion amongst peer experts forms the basis for the panel's final judgement and the advisory report. The focus is on the curriculum, the teaching and learning environment, and student assessment.

The Accreditation Organisation of the Netherlands and Flanders (NVAO) takes a formal decision on the quality of the new programme based on the outcome of the peer review. This decision can be positive, conditionally positive or negative. Following a positive NVAO decision with or without conditions the institution can proceed to offer the new programme. Upon completion of the programme graduates are entitled to receive a legally accredited degree.

This summary report contains the main outcomes of the peer review. A full report with more details including the panel's findings and analysis is also available. NVAO bases an accreditation decision on the full report.

Both the full and summary reports of peer reviews are published on NVAO's website www.nvao.net. There you can also find more information on NVAO and peer reviews of new programmes.

Because of COVID-19 temporary measures apply for this peer review.

2 Panel

Peer experts

1. Peter van der Sijde (*chair*), Professor of Organization, Entrepreneurship & Technology; educational director of the Science, Business & Innovation master programme at the Vrije Universiteit Amsterdam
2. Roeland Ordelman, principal investigator speech technology and multimedia retrieval at University of Twente, innovation manager at Netherlands Institute for Sound and Vision, and chair of the Stichting Open Spraaktechnologie.
3. Youri Maryn, researcher and clinical vocologist/speech-language pathologist at the ENT department of GZA Sint-Augustinus (Wilrijk, Belgium).Founder of Phonanium, a company dedicated to development and distribution of software for automated assessment of voice/speech sounds.
4. Alex Tess Rutten (*student*), follows a Research Master Cultural Analysis at the Universiteit van Amsterdam. Former member of the board of the Amsterdamse Studentenvakbond and the Landelijke Studentenvakbond. She works with TAQT.

Assisting staff

- Yvet Blom, secretary
- Tinka Thede, NVAO policy advisor and process coordinator

Site visit (online)
13 and 14 October 2020

3 Outcome

The NVAO approved panel reaches a positive conclusion regarding the quality of the academic master Voice Technology offered by the University of Groningen. The programme complies with all standards of the limited NVAO framework.

The Master of Science in Voice Technology offers an ambitious and interdisciplinary programme at the interface of Linguistics, Artificial Intelligence and Computer Sciences. Students are equipped to develop voice-driven computer applications. The programme boasts a strong connection with industry due to the involvement of the professional field in the curriculum.

The one-year programme (60 EC) includes phonetics, programming, and machine-learning courses with a dual focus on industry and research. This makes for a challenging and comprehensive curriculum in an inspiring and high-tech teaching and learning environment. The highly skilled teaching staff, the small-scale learning methods and the international classroom provide a potentially successful educational process. Some of the panel's concerns relate to the workload of both students and staff, and the admission criteria.

The programme presents a broad range of student assessments. The panel appreciates the variation and creativity of the assignments, but caution is required to not overburden students and staff given the frequency of testing. Also, the process of writing the thesis in combination with the demonstrator as an extra assignment needs further attention.

All in all, University of Groningen introduces an attractive profile and an inspiring curriculum for an academic master in Voice Technology. The panel concludes that this new programme meets the required level of quality.

4 Commendations

The programme is commended for the following features of good practice.

1. Attractive profile – University of Groningen presents a well-defined and attractive profile for this ambitious and interdisciplinary programme making good use of the input of both industry and PhD students.

2. Teaching-learning environment – The variety in teaching and assessment methods offer a challenging and motivating environment.

3. Staff – The experienced and diverse team of lecturers provide a solid foundation for good education in Voice Technology.

4. Promising careers – Students are offered a solid base for a career in research or industry.

5. High tech facilities – Campus Fryslân has a high tech digital recording laboratory that can be used by students as well as staff members.

5 Recommendations

For further improvement to the programme, the panel recommends a number of follow-up actions.

1. Feasibility – Keep a close eye on the feasibility of the programme. The programme is challenging and quite loaded with many weekly assignments. This has benefits, as it stimulates students to dive into the challenging, interdisciplinary topics in this field. However, a loaded programme also runs the risk that students (and staff) fall behind due to unforeseen circumstances. Also, due to the different background of students (e.g., linguists versus computer scientists), the perceived workload may differ depending on background. Close, individual monitoring of students with respect to feasibility of the programme, and swift identification and mitigation of bottlenecks is therefore crucial.

2. Pre-programme evaluation – Anticipate on the intake of students from both linguistics and engineering/science. It is important to see students from linguistics achieving computer science competencies, and to also see computer science students achieving linguistics/phonetics competencies. Students have be made aware of these challenges before enrolment.

3. Matchmaking – Due to the different background of students, Implement matchmaking into the admission process, together with a motivation letter.

3. Workload staff – Observe and check the workload of the staff especially because of the assessment of the many assignments and the relatively large amount of time the staff needs to spend on individual/group supervision.

4. Ethics – Ensure this ethics is adequately covered throughout the different courses. Addressing ethics as a clear, individual strand within the programme avoids fragmentation and the risk that the topic submerges.

5. Regional focus – Keep a close eye on regional and national developments and avoid letting the international ‘ Big Tech’ emphasis get the upper hand.

6 What comes next?

NVAO grants initial accreditation to a new programme on the basis of a panel’s full report. The decision is valid for a maximum of six years. Upon accreditation the new programme will follow the NVAO review procedures for existing programmes. NVAO publishes the accreditation decision together with the full report. A summary report is also available.[1]

Each institution has a system of quality assurance in place ensuring continuous follow-up actions and periodic peer-review activities. Peer reviews help the institution to improve the

[1] https://www.nvao.net/nl/besluiten

quality of its programmes. The progress made since the last review is therefore taken into consideration when preparing for the next review. The follow-up activities are also part of the following peer-review report. For more information, visit the institution's website.[2]

[2]https://www.rug.nl/

7 Summary in Dutch

Het panel oordeelt positief over de kwaliteit van de wo-master Voice Technology van de Rijksuniversiteit Groningen. Dit is de uitkomst van de kwaliteitstoets uitgevoerd door een panel van *peers* op verzoek van de Nederlands-Vlaamse Accreditatieorganisatie (NVAO). Voor deze beoordeling heeft het panel gesprekken gevoerd met de opleiding op 13 en 14 oktober 2020.

De masteropleiding Voice Technology is een interdisciplinaire opleiding op het snijvlak van Taalkunde, Artificiële Intelligentie en Computerwetenschappen. Studenten worden toegerust om computerapplicaties te ontwikkelen gericht op spraakgestuurde mens-machine interactie met behulp van bijvoorbeeld spraakherkenning en spraaksynthese. De opleiding is in nauwe samenwerking met het werkveld ontwikkeld en sluit daarom goed aan bij de behoeftes van het werkveld.

De opleiding heeft een studielast van 60 EC, verdeeld over een jaar. Het curriculum bestaat uit vakken gericht op fonetiek, programmeren en machine-learning. Binnen de opleiding wordt zowel op het werkveld als op onderzoek gefocust. Dit zorgt voor een uitdagend en uitgebreid curriculum in een inspirerende en high-tech onderwijs- en leeromgeving. Het hoogopgeleide personeel, de kleinschalige leermethoden en de internationale klas vormen een solide basis voor kwalitatief onderwijs.

Studenten krijgen te maken met wekelijkse opdrachten. Het panel waardeert de afwisseling en creativiteit van de opdrachten, maar gezien de frequentie waarop tests worden afgenomen is voorzichtigheid geboden. De opleiding moet ervoor waken dat studenten en docenten niet overbelast geraken. Ook het proces van het schrijven van de thesis in combinatie met het ontwikkelen van een *demonstrator* behoeft verdere aandacht in verband met de daarbij komende werkdruk.

Al met al introduceert Groningen een aantrekkelijk profiel en een inspirerend curriculum voor een academische master in Voice Technology. Het panel concludeert dat deze nieuwe opleiding voldoet aan het vereiste kwaliteitsniveau.

Meer informatie over de NVAO-werkwijze en de toetsing van nieuwe opleidingen is te vinden op www.nvao.net. Voor informatie over de Rijksuniversiteit Groningen verwijzen we naar de website van de instelling.[3]

Als gevolg van de beperkende omstandigheden door COVID-19 geldt voor deze kwaliteitstoets een tijdelijke procedure.

[3]https://www.rug.nl/

The summary report was written at the request of NVAO and is the outcome of the peer review of the new programme
Academic master Voice Technology of University of Groningen

Application no: 009338

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FULL REPORT
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1 Peer review

The Accreditation Organisation of the Netherlands and Flanders (NVAO) determines the quality of a new programme on the basis of a peer review. This initial accreditation procedure is required when an institution wishes to award a recognised degree after the successful completion of a study programme.

The procedure for new programmes differs slightly from the approach to existing programmes that have already been accredited. Initial accreditation is in fact an ex ante assessment of a programme. Once accredited the new programme becomes subject to the regular review process.

The quality of a new programme is assessed by means of peer review. A panel of independent peers including a student reviews the plans during a site visit to the institution. A discussion amongst peer experts forms the basis for the panel's final judgement and the advisory report. The agenda for the panel visit and the documents reviewed are available from the NVAO office upon request.

The outcome of this peer review is based on the standards described and published in the limited NVAO Assessment framework for the higher education accreditation system of the Netherlands (Stcrt. 2019, nr. 3198). Each standard is judged on a three-point scale: meets, does not meet or partially meets the standard. The panel will reach a conclusion about the quality of the programme, also on a three-point scale: positive, conditionally positive or negative.

This report contains the findings, analysis and judgements of the panel resulting from the peer review. It also details the commendations as well as recommendations for follow-up actions. A summary report with the main outcomes of the peer review is also available.

NVAO takes an accreditation decision on the basis of the full report. The NVAO decision can be positive, conditionally positive or negative. Following a positive NVAO decision with or without conditions the institution can proceed to offer the new programme.

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2 New programme

2.1 General data

Institution	:	University of Groningen
Programme	:	academic master[1] Voice Technology
Mode of study	:	full time
Grade	:	Master of Science
Location	:	Leeuwarden
Study load	:	60 EC[2]
Field of study	:	Cross-sectoral (confirmed by panel)

2.2 Profile

The University of Groningen aims to provide students of the Master of Science in Voice Technology with knowledge and skills related to Linguistics as well as Computer Science. The one-year programme contains a total of 60 European Credits (EC). Voice technology uses a combination of linguistic knowledge, computer programming skills and machine learning to understand the underlying mechanisms of voice technology applications, such as speech recognition and speech generation, from both a linguistics and technology point of view. The academic programme aims for a practical approach focussing on real-life applications and collaborations with industry. Graduates of the programme will be able to contribute to new voice technology initiatives and promote innovations which transform the way humans interact with interconnected devices. This new master programme is going to be offered by the faculty of Campus Fryslân and is aligned with the faculties of Science and Engineering and Arts of the University of Groningen.

2.3 Panel

Peer experts

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Assisting staff

- Yvet Blom, secretary
- Tinka Thede, NVAO policy advisor and process coordinator

[1] In Dutch: wo-master
[2] European Credits

Site visit (online)
13 and 14 October 2020

3 Outcome

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The Master of Science in Voice Technology offers an ambitious and interdisciplinary programme at the interface of Linguistics, Artificial Intelligence and Computer Sciences. Students are equipped to develop voice-driven computer applications. The programme boasts a strong connection with industry due to the involvement of the professional field in the curriculum.

The one-year programme (60 ECTS) includes phonetics, programming, and machine-learning courses with a dual focus on industry and research. This makes for a challenging and comprehensive curriculum in an inspiring and high-tech teaching and learning environment. The highly skilled teaching staff, the small-scale learning methods and the international classroom provide a potentially successful educational process. Some of the panel's concerns relate to the workload of both students and staff, and the admission criteria.

The programme presents a broad range of student assessments. The panel appreciates the variation and creativity of the assignments, but caution is required to not overburden students and staff given the frequency of testing. Also, the process of writing the thesis in combination with the demonstrator as an extra assignment needs further attention.

All in all, Groningen introduces an attractive profile and an inspiring curriculum for an academic master in Voice Technology. The panel concludes that this new programme meets the required level of quality.

Standard	**Judgement**
1 Intended learning outcomes	meets the standard
2 Teaching-learning environment	meets the standard
3 Student assessment	meets the standard
Conclusion	**positive**

4 Commendations

The programme is commended for the following features of good practice.

1. Attractive profile – University of Groningen presents a well-defined and attractive profile for this ambitious and interdisciplinary programme making good use of the input of both industry and PhD students.

2. Teaching-learning environment – The variety in teaching and assessment methods offer a challenging and motivating environment.

3. Staff – The experienced and diverse team of lecturers provide a solid foundation for good education in Voice Technology.

4. Promising careers – Students are offered a solid base for a career in research or industry.

5. High tech facilities – Campus Fryslân has a high tech digital recording laboratory that can be used by students as well as staff members.

5 Recommendations

For further improvement to the programme, the panel recommends a number of follow-up actions.

1. Feasibility – Keep a close eye on the feasibility of the programme. The programme is challenging and quite loaded with many weekly assignments. This has benefits, as it stimulates students to dive into the challenging, interdisciplinary topics in this field. However, a loaded programme also runs the risk that students (and staff) fall behind due to unforeseen circumstances. Also, due to the different background of students (e.g., linguists versus computer scientists), the perceived workload may differ depending on background. Close, individual monitoring of students with respect to feasibility of the programme, and swift identification and mitigation of bottlenecks is therefore crucial.

2. Pre-programme evaluation – Anticipate on the intake of students from both linguistics and engineering/science. It is important to see students from linguistics achieving computer science competencies, and to also see computer science students achieving linguistics/phonetics competencies. Students have to be made aware of these challenges before enrolment.

3. Matchmaking – Due to the different background of students, Implement matchmaking into the admission process, together with a motivation letter.

4. Workload staff – Observe and check the workload of the staff especially because of the assessment of the many assignments and the relatively large amount of time the staff needs to spend on individual/group supervision.

5. Ethics – Ensure this ethics is adequately covered throughout the different courses. Addressing ethics as a clear, individual strand within the programme avoids fragmentation and the risk that the topic submerges.

6. Regional focus – Keep a close eye on regional and national developments and avoid letting the international ‘ Big Tech’ emphasis get the upper hand.

6 Assessment

6.1 Standard 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.

Judgement
Meets the standard.

Findings, analysis and considerations
The programme's main objectives are to teach students the fundamentals of voice technology, consisting of both linguistic knowledge and computer science skills such as Artificial Intelligence (AI) and programming, focussing on applications for human-machine interaction such as speech synthesis and speech and speaker recognition. The panel reviewed the master's intended learning outcomes and has reached the conclusion that the outcomes comply with the master level Dublin Descriptors. Based on interviews conducted with programme representatives, related industries and PhD students, who are involved in voice technology research, the panel finds that the intended learning outcomes demonstrate relevant knowledge and skills for research and industry purposes. According to the panel, the intended learning outcomes are ambitious. Particularly because students come from a wide range of backgrounds. This makes it challenging for them to acquire skills and knowledge from a field that might be entirely new to them. The panel values the programme's ambitious learning outcomes which are up-to-date and in accordance with industry needs and demands.

The programme aims to attract students with a Bachelor of Science in Artificial Intelligence or Computing Science with an interest in linguistics and students with a Bachelor of Arts in Linguistics who have a strong interest in voice technology and programming. Current master graduates typically have either linguistic or AI-related knowledge, but not both. The need for a combined Linguistics and Computer Science programme was highlighted by industry representatives during the online discussion with the panel. The representatives explained that there is a growing demand for graduates that have a solid understanding of voice technology. There is currently no master programme in the Netherlands that focuses on voice technology in an interdisciplinary manner, combining both linguistic knowledge and computer science skills. Therefore, the industry currently often needs to fill the knowledge gaps in either linguistics or programming and machine learning. The industry representatives emphasised that the Voice Technology master programme therefore contributes significantly to present knowledge and experience needs in industry. The panel acknowledges that the intended learning outcomes fulfil the gap in the current education system and the need for a combined Linguistics and Computer Science programme.

The panel finds that the programme has actively involved relevant AI and linguistics businesses, to contribute to the programme. The organisation has also consulted PhD students. As a result of these consultations a clear and attractive profile for the master programme has been developed. The programme management has stated to continue seeking advice, through the advisory board, from industry representatives for further development of the programme. The panel appreciates management liaising with industry professionals as this results in a strong connection between the intended learning outcomes and industry needs. The inspiring learning outcomes and the clear industry involvement are positive. However the panel wants to remind the organisation to keep a healthy balance between

academic and industry skills. This is a master programme and the emphasis should be on academic skills.

In line with Campus Fryslân's vision to contribute to global challenges with local solutions, the programme focusses on global as well as local needs. An example of a global challenge is multilingualism. The faculty where the programme will take place is located in the Dutch province of Friesland (Fryslân). Frisian is the second spoken language in this province. Therefore the programme will pay close attention to challenges related to building speech applications that serve regional and national markets, such as speech recognition in a multilingual setting or for under-resourced languages such as Frisian. The panel is aware of the programme's intended concept, but has noticed a significant emphasis on the dominant technology firms ('Big Tech'). Therefore the panel recommends the organisation to explicitly focus on regional and national market developments in addition to the focus on international developments. This way, the programme establishes further alignment to Campus Fryslan's vision on local solutions. Furthermore, the rapid changing nature of the industry requires the organisation to stay vigilant of such changes and ensure the programme is kept up-to-date.

The programme takes place on the edge of the linguistics as well as the AI field, which relates to the CROHO[3] fields nature and language and culture. The organisation therefore requested to have the master classified under the CROHO cross-sectoral component. Management explained that voice technology is a balanced symbiosis between the arts and sciences. When the programme is solely categorised under either arts or sciences, it would not do justice to the fundamental aspect of voice technology. From the information the panel received it is clear that both arts and sciences play an equal role within the programme. Besides, the importance of both fields has been highlighted during the online discussions with the programme's stakeholders. As the fields are undeniably connected with each other throughout the programme, the panel supports the application for the CROHO field of study: cross-sectoral.

The panel is impressed with the very ambitious and well-formulated intended learning outcomes of the new master in Voice Technology. Voice Technology offers a state of the art profile that clearly meets the industry's needs. The panel is positive about the substantial involvement of industry but advises to keep a close eye on the academic side of the master. Also the focus on the regional dimension and the latest developments need continuous attention. The panel concludes that the new programme presents an inspiring profile that enables graduates to improve many facets of modern life through voice technology.

6.2 Standard 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.

Judgement
Meets the standard.

Findings, analysis and considerations
The panel is of the opinion that the learning objectives have successfully been translated into a comprehensive curriculum including a broad spectrum of topics such as linguistics, speech recognition, speech synthesis, programming and machine learning. Cohesion within the

[3]Central Register of Higher Education Study Programmes

curriculum is achieved through a very broad introduction in the first block (15EC). This block lays out background skills in computer programming and speech sounds analysis as well as an introduction to data management, privacy issues, human-machine interaction and voice technology applications. The panel appreciates the broad introduction to form a solid knowledge base on voice technology and the way the programme then progresses towards intensifying knowledge and skills in the second and third blocks (each 15EC). In these blocks, the programme focusses on applications and deepening of speech recognition and speech synthesis. In the fourth and final block (15EC), students write a thesis where they combine their acquired knowledge and skills. This thesis consists of research conducted related to an academic research question. As part of the thesis, students are also required to develop a functional speech application demonstrator. According to programme and industry representatives, this demonstrator will further enhance employment opportunities for graduates. The panel appreciates the idea of developing a demonstrator as part of the final assignment and believes this to be an academic endeavour. The demonstrator as part of the thesis helps graduates proof their practical and programming abilities when applying for jobs.

Cross-curricular learning trajectories, 1) academic expertise, 2) interdisciplinary learning and 3) ethics also aid in reaching the desired cohesion of the programme. Each trajectory is closely connected with three or more of the Voice Technology courses. During online sessions, the panel asked the programme management as well as industry representatives about the focus on ethics within the master. According to the programme management voice technology is prone to legal and scientific concerns like data-collection, data-management and privacy matters. The industry representatives emphasised that the industry seeks professionals who are fully aware of the ethical responsibilities related to voice technologies. Graduates should be aware of what is ethical and what is not and how to ethically handle data. The industry therefore considers the programme's focus on ethics a considerable benefit. The panel agrees that ethics is of great importance to voice technology and therefore advises to maintain a strong emphasis on this topic.

The panel believes the didactical approach within the programme is adequate for students to gain academic voice technology knowledge and skills. The programme has a small-scale setup and teaching methods are thorough due to a focus on research. A collaborative learning method is used throughout the entire programme. Students with different linguistic backgrounds on the one hand and AI and Computer Science backgrounds on the other hand, work together in small groups, referred to as learning communities. Weekly group assignments and projects are used to challenge students. A variety of different backgrounds and industries will enable students learn a great deal from each other. The collaborative learning method strengthens the concept of the international classroom, which is one of the cornerstones of the University of Groningen's education policy. The international classroom helps students developing knowledge and skills necessary for the rapidly globalising labour market. Due to the variety in teaching methods, the panel believes that the teaching-learning environment is challenging and motivating.

The Voice Technology master is setup in English. The programme management, lecturers and industry representatives have given numerous reasons for this language choice: students' future (international) careers, the global academic field of voice technology and the diverse staff backgrounds. Firstly, students who aspire careers at a technology company that work in an international setting will have the benefit of completing an English programme. Secondly, from an academic perspective, the discipline of voice technology is highly international. All

relevant textbooks, academic papers and journals are therefore in English. Lastly, most lecturers teach in English, due to their non-Dutch background. The panel agrees with the organisation's choice to adopt English as the working language, to follow industry and research standards.

During online discussions with the programme management and other staff, the panel met with passionate and dedicated people. The core team involved in the Voice Technology master programme consists of five lecturers and one programme director. The experienced lecturers form a group of wide range experts. The panel highly appreciates the sound foundation lecturers provide to students for a career in either research or voice technology related industries. The panel was also pleased to learn that all members of the teaching staff will obtain a University Teaching Qualification (UTQ[4]). On top of that, each lecturer will do an intercultural course, which the panel considers to be an excellent preparation for the international classroom concept. A point of concern is the staff's work load, with weekly assignments, student guidance and teaching at a high pace and in a dense programme, the organisation has to ensure to monitor this on a regular basis.

The master expects to start in 2021 with approximately 25 students. Because of the inspiring curriculum combining language and technology, the panel wondered what type of student will attend the programme. Applicants for the master are expected to hold a Dutch bachelor degree in the field of linguistics, AI or computing science. Applicants with a different Dutch education background, and/or international degree or applied science degrees will get admitted by the Admissions Board. In these cases the Admissions Board will decide on the applicant's admission on a case by case basis. According to the programme's application for initial accreditation, applicants should have adequate (basic) programming and phonetics expertise. Applicants without these skills are advised to complete a MOOC[5] to make up for the lack of knowledge on these topics. During online discussions with the programme management and lecturers, the panel shared its apprehensions on the programme's requirements for prospective students. The organisation expects to benefit from prior experience with similar programmes. Even so, the panel is concerned that a vast majority of students will either have to brush up on their programming or phonetics skills, or both and that they have to do this on top of an already very full programme.

The panel asked the representatives of the programme to elaborate on the panel's concerns. The representatives of the programme outlined that students are expected to have a natural affinity towards programming if they have a background in linguistics, or towards linguistics if they have a background in programming. The representatives also confirmed that the programme steers its marketing strategies towards students with a bachelor's degree in digital humanities, AI, programming, et cetera. This contributes to finding suitable students who match with the programme. The representatives of the programme also proposed the idea of including a matchmaking interview with applicants to carefully manage students' expectations. The faculty has experience with matchmaking interviews and thinks it could be a good tool for this programme too. The panel appreciates the matchmaking proposal and strongly suggests implementing it into the admission process, together with a motivation letter.

[4] In Dutch: Basiskwalificatie Onderwijs (BKO)
[5] Massive Open Online Course

The feasibility of the programme is another concern when it comes to the diverse student intake. Particularly as the programme includes a curriculum with weekly assignments and a challenging thesis project for which students not only have to write their thesis, but also need to build a demonstrator as part of the thesis. During the online discussions, the panel shared its concern that the workload could be too much for students as well as staff members. The representatives of the programme agreed with the panel's workload observation. However, the hours for each course have been carefully calculated and accounts to a total of 60 ECTS. After careful investigation of the panel into the calculations, the panel acknowledges that the workload does fall within the 60 ECTS scope. Additionally, the panel was pleased about the fact that the management drafted different scenarios for the programme to be adjusted if necessary. Therefore, if the workload turns out to be too high, the programme can be adjusted, if for example an overrepresentation of either linguistic or AI students occurs. As this programme strongly relies on symbiosis and exchange of knowledge and skill between groups of students (from linguistics to computer science, and vice versa), especially for the weekly assignments, a balanced intake of students from both fields is required and should be guaranteed. The solid team of educators and the expected modest student population, combined with the quality assurance checks, has convinced the panel that the organisation is able to manage the workload for staff and students. The panel recommends however closely monitoring the feasibility of the programme and students' wellbeing in relation to the aforementioned workload. The panel emphasis that making one or more assignments for a grade each week is a completely different task than reading a text every week, although it counts towards the same hours when calculating the 60 ECTS.

As the assessment was conducted online, the panel has been unable to see the facilities for itself. Instead, the organisation provided the panel with a pre-recorded digital tour of Campus Fryslân. The panel has watched the recording of the various facilities throughout the Campus Fryslân and University of Groningen, and is particularly impressed with the high tech digital recording lab that can be used both by students and staff members. Also, computers are facilitated with relevant software needed for the Voice Technology programme. During the online discussions, the panel was informed that students do not have to purchase any special computers or equipment. The programme only requires a basic laptop. And, since the programme is mainly cloud-based, students do not need expensive hardware or software either. The panel understood that there are also lab assistance available to help students with practical technical issues; an important requirement for reducing workload (and stress) of both students and staff.

After completion of the accreditation process a new committee will be formed: the Programme Committee of Voice Technology. This committee will from than onwards be responsible for improving and assuring the programme's quality.

The panel is convinced that the University of Groningen offers a challenging and comprehensive curriculum with a dual focus on industry and research in an inspiring and high-tech teaching and learning environment. The highly skilled teaching staff enables students to achieve the proposed learning outcomes. The panel had severe concerns about the programme's feasibility. The panel suggests that the programme changes its admission procedure: the organisation needs to ensure each prospective student includes a motivation letter and is subject to a matchmaking interview. Additionally, students' progress and wellbeing needs to be monitored closely. Campus Fryslân facilitates computers with relevant software needed for the Voice Technology programme and a high tech digital recording lab

that can be used both by students and staff members. Taking all the above into account, the panel is of the opinion that the curriculum, lecturers and programme-specific services and facilities enable students to achieve the intended learning outcomes.

6.3 Standard 3: Student assessment

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

Judgement
Meets the standard.

Findings, analysis and considerations
The panel concludes that the programme has suitable procedures in place to assess students' achieved learning outcomes. The rules, regulations and procedures regarding assessments fall under the quality assurance of the Faculty of Campus Fryslân which is outlined in the Quality Assurance Protocol Campus Fryslân. The protocol complies with the policy and procedures of the University of Groningen. The presented information, prior to the online site visit, included the programme's course book, the assessment plan and the Teaching and Examination Regulations (TER).

In line with the quality assurance policy, Campus Fryslân installed a Board of Examiners and a Programme Committee for each individual bachelor and master programme. The panel learned that the Board of Examiners has been expanded with one of the members of the development team of the master programme. The panel is of the opinion that adding that lecturer to the Board is a positive development. It increases the Board's knowledge of the programme which improves the Board's connection with and the quality of the programme as a whole. As set out in the university regulations, the Board also has the power to grant exemptions within the constraints of the TER. During the online discussions with the panel, the Board of Examiners seemed well informed in regard to the learning outcomes of the master. The members of the Board explained that they have been involved with the development of the programme, and will continue their involvement by means of monitoring the programme.

The panel examined the programme's assessment plan and concludes that the programme adopts a wide range of formative assessment types. These assessments help to measure students' progress and provide feedback. The type of assessments include quizzes, presentations and group assignments or activities. Summative assessments form part of the programme as well. Summative assessments consist of a (midterm) exam or final assignment, in order to establish whether the student has achieved the intended learning outcome(s).

The panel highly values the focus on different skills and learning processes in the programme. During the online discussions with the development team and the Board of Examiners, the representatives explained that diversity in assessment methods is very important. It provides students with the opportunity to explore and exploit their strengths. The panel values the variety in and creativity of the assignments. The assessments address key learning objectives and relevant skills and contribute to the students' learning curve. The panel believes that different assessments are a good way to attain a diverse set of skills. Even though the panel values the variety and creativity of the assessments, the weekly assessments can create a considerable workload for both students and lecturers as already mentioned when discussing Standard 2. The management of the faculty, however, justifies the choice for weekly

assessments. It argues that conventional exams are held during specific peak periods throughout the year which can result in pressure for students.

The programme is completed with a thesis project. This project consists of research conducted related to an academic research question. As part of the project, students are also required to develop a functional speech application demonstrator. The panel appreciates the idea of developing a demonstrator as part of the final assignment and believes this to be an academic endeavour. The demonstrator as part of the thesis is also an extra assignment that students need to complete in the course of addressing the research question that is central to the thesis project. There is a clear risk that building a demonstrator-- appreciated by students given the tangible outcome-- draws attention away from the research question (academic content), as well as the when students are less comfortable with programming. This, combined with the limited amount of time students have to write their thesis, the panel recommends close monitoring the process of the weekly assignments and the process of the thesis to ensure students can cope with the vast amount of assessments.

The panel concludes that the master programme has an adequate quality assurance system in place. The programme offers a wide variety of assessments and assignments aligning with the intended learning outcomes and learning objectives for each given course. The panel appreciates the variation and creativity of the assignments, but caution is required to not overburden students and staff with too many. Also the process of writing the thesis in combination with the demonstrator as an extra assignment needs careful monitoring.

6.4 Grade and field of study

The panel advises awarding the following degree to the new programme: Master of Science. The panel supports the programme's preference for the following field of study: Cross-sectoral.

Abbreviations

AI	Artificial Intelligence
CROHO	Central Register of Higher Education Study Programmes
MOOC	Massive Open Online Course
UTQ	University Teaching Qualification

The full report was written at the request of NVAO and is the outcome of the peer review of the new programme academic master Voice Technology of University of Groningen

Application no: 009338

NVAO

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