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Bachelor Human Movement Sciences VU Amsterdam

Report of the limited programme assessment
January 22nd and 23rd 2019

Utrecht
April 2019
www.AeQui.nl
Assessment agency for higher education

Colophon

VU Amsterdam
De Boelelaan 1105
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Programme:	Bachelor Human Movement Sciences
Location:	Amsterdam
Mode of study:	Full-time
Croho-registration:	56950

Assessment committee
Raoul van Aalst, chair
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Anton Wagenmakers, domain expert
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The committee was presented to the NVAO for approval.

The assessment was conducted under the responsibility of
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Content

Summary

On January 22nd and 23rd 2019 an AeQui committee performed an assessment of the bachelor programme in Human Movement Sciences of Vrije Universiteit Amsterdam (VU Amsterdam). The overall judgement of the committee is that the quality of the programme is **good**.

Intended learning outcomes
The committee assesses the intended learning outcomes as **satisfactory**. The committee concludes that the intended learning outcomes have been concretised with regard to content, level and orientation and meet international requirements. The intended learning outcomes tie in with the domain-specific reference framework, drawn up by all the Dutch programmes in human movement sciences in the Netherlands. In addition, the committee notes that the Dublin descriptors are adequately represented in the intended learning outcomes. The programme explicitly focuses on academic thinking and reasoning within the field of HMS. The committee appreciates the role of the advisory board.

Teaching-learning environment
The assessment committee assesses the orientation of the programme as **good**. The committee concludes that the programme enables students to realise the intended learning outcomes. The structuring in different types of courses adds to the coherence of the programme. The programme's focus on academic skills, thinking and reasoning is made explicit as well as the multidisciplinary character of the programme. The programme offers students a broad foundation in HMS and as the programme progresses, more room for specialisation. The committee appreciates the interactive and modern teaching methods used in the programme. The programme also offers ample opportunities for students to inform themselves about their future career opportunities. The students also value this.
The staff is very competent, enthusiastic and involved. The team of lectures is quite coherent and meets on a regular basis to discuss the content of the programme and the relation between courses. The committee appreciates that with increasing student numbers, the approachability of lecturers is still very good and that the open-door policy is held up. The committee notes however that the workload of lecturers needs continuous monitoring. The committee concludes that the programme applies the legal enrolment criteria. The so-called matching days provide candidates with useful information about studying HMS at VU Amsterdam.

Assessment
The assessment committee concludes that the programme has an adequate system of assessment in place, and assesses this standard as **good**. The intended learning outcomes are at the basis of the system. Effective measures are taken to guarantee the validity, reliability and transparency of the assessments, by using an assessment programme, the four-eyes principle and random reviews of assessments and theses by the examinations board. The level of the different assessments studied by the committee during the site visit was high; in addition, the committee appreciates the variety in assessment methods used. The examinations board and its sub-committees are effectively organised and safeguard the quality of the assessments. The committee especially appreciates the varied ways in which the board checks the quality of assessments and theses.

Achieved learning outcomes
The committee assesses this standard as **good**. Based on the studied documents and the interviews, the committee concludes that graduates

of the bachelor programme HMS exceed the required level and the intended learning outcomes. The programme has a solid and comprehensive graduation process in place. The committee especially values that students write a literature thesis and conduct a research project. This ties in with the programmes main focus on educating academic thinking, reasoning and research skills. The committee concludes that the overall quality of the studied theses is high. The theses can match with theses from master's programmes. The theses studied were very well written and showed up to date research methods and analyses. The level of the programme was confirmed during the meeting with students and alumni, who seem to be well spoken and capable of creating their own career path within human movement sciences.

Recommendations

The committee recommends making the intended learning outcomes more specific, to help strengthen the positioning of the programme.
Furthermore, the committee encourages the programme to keep promoting the use of the assessment matrices; this can contribute to the overall quality of the assessments and can ensure that assessments also address the application of knowledge.

All standards of the NVAO assessment framework are positively assessed; hence the committee awards a positive recommendation for the accreditation of the bachelor programme in Human Movement Sciences of VU Amsterdam. The committee concludes that the overall assessment of the programme is **good**.

On behalf of the entire assessment committee,
Utrecht, April 2019

Raoul van Aalst
Chair

Titia Buising
Secretary

Introduction

The bachelor programme in Human Movement Sciences aims to develop students into engaged and responsible academics who are well prepared for suitable jobs and for successfully entering and completing a variety of master's programmes fitting their talent and ambition. Students are educated to make valuable contributions to Human Movement Sciences and society. The multidisciplinary programme focuses on acquiring academic skills with a strong emphasis on empirical approaches, mechanisms and research methods in natural sciences.

The institute

The bachelor programme Human Movement Sciences is part of the Faculty of Behavioural and Movement Sciences of VU Amsterdam. The faculty is the result of a merger between the Faculty of Psychology & Educational and Family Studies and the Faculty of Human Movement Sciences in 2015. The faculty provides bachelor's and (research) master's programmes for approximately 3500 students.

Besides the bachelor programme, the cluster of Human Movement Sciences programmes also contains the master programme Human Movement Sciences, the research master Human Movement Sciences and the master programme Musculoskeletal Physiotherapy Sciences. The lecturers of the four programmes are appointed by the department of Human Movement Sciences.

Each programme offered has a programme director. The programme director is primarily responsible for the development of the mission and vision of the programme, their translation into the programme's content, and for guarding that the courses and their assessments contribute to the end qualifications. The programme director is in close contact with the appointed course coordinators and the programme committee.

The programme

The Dutch taught bachelor programme comprises 180 EC. The programme has a multidisciplinary character, that is reflected in the overall programme as well as in the individual courses. The programme focuses on academic thinking and reasoning within the field of HMS. The intended learning outcomes of the programme are in line with the domain-specific framework of reference for the Human Movement Sciences programmes in the Netherlands.

Within the programme four types of courses are distinguished: academic core courses (focusing on academic skills), courses that address the content of the field, such as the structure and function of the human body, motor development, training, or pathology; courses on mathematics, physics and methodology and the capstone projects. The latter include the bachelor thesis and the bachelor research project. The different types of courses are present in each phase of the programme.

The first year offers a broad spectrum of courses related to HMS. In the second year, this knowledge is deepened. In the third year, students can broaden or deepen their knowledge in a minor. The minors of the HMS department also give students an insight into career opportunities within the field of the minor. The programme is completed with the bachelor thesis and the bachelor research project

Cluster visitation

Since the committee visited all human movement sciences programmes, it was able to see similarities and differences between these programmes. All universities involved have their own specific focus. Learning at Maastricht Uni-

versity is characterized by the problem-based learning concept. Human Movement Sciences at Maastricht University is offered at masters level, with specialisations in Health & Rehabilitation, Sports & Nutrition and Physiotherapy. Particularly, the strong expertise in nutrition, exercise physiology and the Physiotherapy specialisation are quite unique.
At VU Amsterdam, human movement sciences is offered at bachelor's and master's level. There is a strong focus and staff expertise on biomechanics, modelling, movement analysis and sports. The university also offers the only research master in human movement sciences in the Netherlands.
University of Groningen also offers human movement sciences at bachelor's and master's level. The bachelor programme has a strong focus on neuroscience and statistics. The master's programme Human Movement Sciences is a two-year programme. The programmes have a close relation with the departments in rehabilitation and orthopaedics of UMCG.
Even though all three universities offer a programme or specialisation in sports, the focus is different. Maastricht University addresses sports and nutrition. The VU focuses on sport psychology, biophysics in sports and high-performance coaching. In relation to elite sport, the programme is connected to 'cyclic' sports. The master's programme in Sport Sciences in Groningen has a broad focus within this specific field, ranging from sport and cognition in children to performance analysis and optimisation in sport. Within top sport, the programme is more connected to (Olympic) team sports.

In general, the committee recommends all programmes to stay in touch with new technologies and developments, such as big data, machine learning and cutting-edge molecular analyses of human blood and tissue samples.

The assessment
VU University assigned AeQui VBI to perform a quality assessment. In close co-operation with AeQui, and the other programmes part of this cluster, an independent and competent assessment committee was convened. A preparatory meeting with representatives from the programme has taken place.
The quality assessment involved all universities (except from Nijmegen) and programmes that are part of the Human Movement Sciences cluster in the Netherlands. The site visits were held between January 21st and 25th. The site visit at VU University took place at January 22nd and 23rd, in accordance with the programme in attachment 2. The committee explicitly oriented itself on the cluster of which the programmes are part. This took place during the preparatory meetings for each site visit and the last committee meeting in which the final assessment took place. For the assessment of the master's programme Human Movement Sciences of Maastricht University and more specific the Physiotherapy specialisation, Bart Staal was part of the committee. The other committee members participated in all assessments part of this cluster.

The committee assessed all programmes in an independent manner. At the conclusion of the assessment, the results were presented to representatives of the programme. The draft version of this report was sent to the programme representatives; their reactions have led to this final version of the report.

Initiated by the programme, a developmental meeting will take place in October 2019. The results of this meeting will not influence the assessment written down in this report.

1. Intended learning outcomes

The committee concludes that the intended learning outcomes have been concretised with regard to content, level and orientation and meet international requirements. The intended learning outcomes tie in with the domain-specific reference framework, drawn up by all the Dutch programmes in human movement sciences. In addition, the committee notes that the Dublin descriptors are adequately represented in the intended learning outcomes. The programme explicitly focuses on academic thinking and reasoning within the field of HMS. The intended learning outcomes are however quite general and the committee suggests to make these more specific. This can strengthen the positioning of the programme. The committee appreciates the role of the advisory board.

Findings

The bachelor programme covers the multidisciplinary field of HMS, from sport psychology to muscle physiology and from exercise physiology to coordination dynamics. The focus is on acquiring academic skills, related to methods in natural sciences, like measuring oxygen uptake and collecting and analysing kinematic and force data and electromyograms. Within the sports domain, the emphasis is on individual sports and individual athlete capacities, but also on talent identification.

The programme explicitly focuses on acquiring academic skills, and on approaches, mechanisms and research methods in natural sciences. According to the programme, these methods are ideally suited for training students to think and reason well.

The programme aims to educate students to make valuable contributions to the field of human movement sciences and society. This requires academic skills, in particular critical thinking. Students are expected to always question statements they hear or read, inside or outside of science. Students are also expected to try to identify and check the underlying facts and to evaluate the soundness and validity of arguments leading up to these statements. Besides, students have to be able to identify facts to build their own sound and valid argumentations to draw their own conclusions.

Students are taught to formulate both theoretical and practical research questions, and solve them by integrating existing knowledge and acquiring new knowledge through experimental, conceptual and historical research. A creative and critical use of knowledge, concepts and methods is at the heart of the programme.

The intended learning outcomes tie in with the domain-specific framework of reference for HMS, which was drawn up by the universities involved in this quality assessment. All Dutch HMS programmes meet twice per year to discuss developments in the field of human movement sciences and sport sciences. The intended learning outcomes are described by using the Dublin descriptors.

An advisory board provides a critical external perspective on the programmes of the department and their future, and supports and advises the Programme Directors on current and future activities. The Advisory Board consists of senior academics and representatives from the field of work.

Considerations

Based on the interviews and the examination of underlying documentation, the committee concludes that the intended learning outcomes tie in with (inter)national requirements for human movement sciences and the Dublin descriptors.

Based on an overview of the relation between courses and intended learning outcomes (as provided in the assessment programme) and the course descriptions, the committee notes that all

intended learning outcomes are covered. The programme has an explicit academic focus: academic thinking and reasoning within the field of HMS is the main goal of the programme.

The committee notes that the intended learning outcomes are quite general. Specifying these can lead to a more differentiated profile and positioning of the programme.

The committee appreciates the role of the advisory board. This contributes to the relevance and topicality of the programme.

Based on the above, the committee assesses this standard as **satisfactory**.

2. Teaching-learning environment

The committee concludes that the programme enables students to realise the intended learning outcomes. The structuring in different types of courses adds to the coherence of the programme. The programme's focus on academic skills, thinking and reasoning is made explicit as well as the multidisciplinary character of the programme. The programme offers students a broad foundation in HMS and as the programme progresses, more room for specialisation. The committee appreciates the interactive and modern teaching methods used in the programme. The programme also offers ample opportunities for students to inform themselves about their future career opportunities. The students also value this.
The staff is very competent, enthusiastic and involved. The team of lectures is quite coherent and meets on a regular basis to discuss the content of the programme and the relation between courses. The committee appreciates that with increasing student numbers, the approachability of lecturers is still very good and that the open-door policy is held up. The committee notes however that the workload of lecturers needs continuous monitoring. The committee concludes that the programme applies the legal enrolment criteria. The so-called matching days provide candidates with useful information about studying HMS at VU Amsterdam.

Findings

Programme
The programme comprises of courses (6 EC each), a minor (30 EC in total), the bachelor's literature thesis (6 EC) and the bachelor's research project (18 EC).
The programme is structured in semesters and periods of eight or four weeks.

The programme consists of four types of courses / components. First, the academic core, in which research methodology and academic skills are addressed as well as scientific philosophy, ethics, history and academic integrity. Secondly courses in which students learn about the structure and function of the human body, motor development, training, pathology, and other topics. The third type of courses address the mathematics and physics required to understand the functioning of the human body, and methodology to conduct research in human movement science. The fourth category includes the capstone projects; the bachelor's thesis and the bachelor's research project. The different types of courses are present in each phase of the programme.

The first year of the programme serves several purposes. First, it aims for students to make a smooth transition from high school to university, where self-study is expected. Second, students are introduced to the field of human movement sciences and can explore whether this matches their interest. In the 'Academische Verkenningen' course, students learn about HMS, possible careers, scientific writing, collaboration with other students and to reflect on their own motivation for choosing the programme. Third, students are expected to acquire a foundation for academic and methodological skills and an understanding of (different disciplines in) the field. Last, the first year provides students with knowledge and understanding of mathematics, biomechanics, structure and function of the human body, human psychology et cetera. This is addressed in courses and practicals such as anatomy practicals and exercise physiology practicals. The latter address for example measurement of heart rate, blood pressure and oxygen consumption. In the 'Verwerken van Digitale Signalen' course, students learn to program in Matlab, which is used in the rest of the programme.

The students the committee met, find the 'Academische Verkenningen' course useful as it prepares them for studying articles and written assignments in the other courses in the programme.

The second year furthers students' knowledge and understanding of the structure and function of the human body, motor learning and development, training and performance, the role of movement in sports and health, movement pathology and other relevant topics in the field of HMS. Part of the academic courses, is the 'Filosofie van de Bewegingswetenschappen' course, which addresses the metaphysical foundation of fundamental concepts within human movement.

Methodological skills are addressed in the 'Meten van Fysische Grootheden' course, where students learn to measure, process and analyse data collected in experiments on humans, and in the 'Mechanische Analyse' course and the 'Klinische Bewegingsanalyse' course, where students apply their knowledge and understanding in solving clinical movement problems.

The site visit revealed that students find the first course of the second year, 'Neurowetenschappen', rather demanding.

The first part of the third year comprises the minor (30 EC). Students can opt for one of the four minors offered by the programme, other minors from VU or other universities or opt for a minor abroad. The minors offered by the programme are 'Gezondheid', 'Sport en Sportpsychologie', 'Psychomotorische Therapie' and 'Bouw, Werking en Sturing van het Bewegingssysteem'. The minors offer in-depth knowledge as well as further training of academic skills and orientation on a future career. The second part of the third year includes the 'Anatomie van het Bewegingsapparaat' course, in which students choose their own direction for expanding their knowledge and skills in human anatomy, the bachelor's thesis and the research project. The latter two are elaborated on in standard 4.

Academic skills are addressed throughout the programme, in the core courses where HMS is placed in a historical perspective and ethical cases in HMS are addressed. These courses also familiarise students with critical thinking and reasoning and academic writing. These skills are also addressed and practiced in other courses, where students write ample essays. In the first year, the writing assignments of the different courses are aligned so the level expected from students gradually builds up. These assignments are part of the writing manual. In the near future, the essay of the 'Wetenschapsgeschiedenis en Filosofie' course and several writing assignments of the second year will be added to the writing manual.
Research and methodological skills are addressed throughout the programme as well. Students learn for example to measure, process and analyse data, to program in Matlab and to apply mathematical and physical concepts to gain understanding of (neuro)physiological and musculoskeletal mechanisms.

Students and alumni are in general satisfied with their programme, the committee learned during the site visit. Students value the broad multidisciplinary character of the programme and opportunities to follow their own interest. Students also value the programmes atmosphere and informal character. Students also appreciate the courses on philosophy even though the examples used are more focused on sports and students prefer examples that cover a broader spectrum of HMS.

Educational concept
The programme aims for personal engagement, openness and responsibility, the core values of the university's vision for education. The programme provides an informal setting with ample contact between student, mentor and lecturers. Students are required to take personal responsibility and to demonstrate self-discipline. Discussions are open and inclusive.

In addition to more traditional teaching methods such as lectures, practicals, working groups and

tutorials, innovative methods such as digital training tools, online quizzes and movie clips are used in several courses. The latter are used in the course on mathematics, where students can watch short clips of mathematical operations by their lecturer on YouTube. In the 'Training en Prestatie' course, students select a clip in which a professional formulates a problem from their own practice, for which students have to formulate a solution. Students receive peer feedback on this via Turnitin. The programme also uses Google forms to receive feedback from students on the difficulty with certain topics, which are subsequently discussed in the workings groups of the specific course. In other courses students receive automated personal feedback on their presentations or discuss the content of the course in an online discussion forum (Canvas).

Intake
The legal enrolment criteria are applicable to the programme. During so-called matching days candidates experience studying HMS for one day, by studying material at home, participating in a lecture, working groups and and doing an exam. Based on this, candidates receive an assessment of their knowledge, skills and affinity with the programme.

Staff
Over thirty lecturers are involved in the bachelor programme of whom three are hired from outside the HMS department. All but four lecturers hold a PhD and 80% holds the certificate of basic teaching. Three staff members hold the certificate of senior teaching. Lecturers usually combine teaching with research. According to the programme, this ensures the academic level of the programme. Junior lectures are appointed for a period of three years and attend the university's basic teaching qualification course. Junior lecturers are primarily involved in the first year, in for example supervising students working in groups. Staff (including junior lecturers) meet on a regular basis to discuss current educational issues.

Students and alumni value the approachability of their lecturers and the junior lecturers. During the programme, lectures more and more connect their own research to the courses. Lecturers and students value this connection, the site visit revealed. Lecturers also remarked that for certain topics, for example exercise physiology, a yearly overview is made of all the aspects that are addressed in the programme, including possible gaps and overlap. Even though lecturers are content with their role within the programme, they also experience a considerable workload.

Facilities
The department offers different (new) laboratories, software and equipment for students and staff. Students can also participate in so called 'dream teams' that offer the opportunity to compete with other universities on certain projects. Canvas is used as a digital learning platform.
The binding study advice at the end of the first year comprises 42 EC and a minimal grade of 4 for the courses on mathematics and biomechanics.

In the first year students are guided by a mentor. The mentor monitors and discusses the progress with each student and if necessary can refer the student to the study advisor. The study advisor has a background in human movement sciences, which can be helpful in advising students in their potential career path. In the second year, students are encouraged to act upon their own responsibility. Junior lecturers and lecturers are available for students. And during the third-year bachelor research project, students are guided by their supervisor.

To inform students about the different possibilities in their potential career path, several activities are organised. These include annual meetings where alumni speak about their work and the possibility to do a practical internship during the minor programme.
In the first year 'Bewegen, Gezondheid & Sportstimulering course, panels are organised

where students meet practitioners in HMS, involved in patient related work. In the minor programme students also receive guidance and advise on their alternatives after graduation and guest lecturers are invited on a regular basis. Students that follow the minor 'Psychomotorische Therapie' are qualified as a psychomotor therapist and directly admissible in the professional master programme Psychomotor Therapy at Windesheim Hogeschool.
The site visit revealed that students and alumni value these activities. Especially the minor provides them with insight in future career paths.

In co-operation with the University of Amsterdam, an honours programme is available. Permissible students receive a personal invitation.

During the site visit, the committee also met representatives from the programme committee. The programme committee meets on a regular bases, and the programme director is present as hearer. Positive evaluations and points for improvement are discussed with lecturers. The goal is to implement improvements in the ongoing academic year and to wait until the next academic year.

Considerations
The committee concludes that the teaching-learning environment and the staff involved enable students to achieve the intended learning outcomes.
The programme has a very coherent structure, in which the academic core courses ensure that students develop relevant academic skills. These skills are also addressed during the other courses, where students demonstrate critical thinking and reasoning in the writing of essays and papers. The programme offers students a broad foundation in HMS and during the programme more room for specialisation.

The committee concludes that the multidisciplinary character of the programme is also reflected in the individual courses. For example, in the 'Training en Prestatie' course aspects of psychology and exercise physiology are addressed. The course on mathematics is also focused on HMS and applying mathematics in the other courses in the programme (for example biomechanics).

The committee appreciates the interactive and modern teaching methods used in the programme. Based on the studied documents, the committee concludes that relevant and up-to-date literature and articles are used in the programme.

The programme offers ample opportunities for students to inform themselves about their future career opportunities. Especially the minors and guest lecturers are helpful in this.

The committee notes that the programme applies the legal enrolment criteria. The committee values the so-called matching days that give candidates useful information about studying HMS at VU Amsterdam.

During the site visit, the committee met with very competent and enthusiastic staff members. The staff is very engaged with students and the programme. The committee also concludes that the department is quite coherent and that lecturers meet on a regular basis to discuss the content of the programme and the relation between courses. The department has a well-functioning system in place with junior lecturers, who also function as mentor for first year students. The committee appreciates that with increasing student numbers, the approachability of lecturers is still very good and that the open-door policy is held up. The committee notes however that the workload of lecturers needs continuous monitoring.

Based on the above, the committee assesses this standard as **good**.

3. Assessment

The committee concludes that the programme has an effective assessment system in place. The intended learning outcomes are at the basis of this system. Effective measures are taken to guarantee the validity, reliability and transparency of the assessments, by using an assessment programme, the four-eyes principle and random reviews of assessments and theses by the examinations board. The level of the different assessments studied by the committee during the site visit was high; in addition, the committee appreciates the variety in assessment methods used. The examinations board and its sub-committees are effectively organised and safeguard the quality of the assessments. The committee especially appreciates the varied ways in which the board checks the quality of assessments and theses.

Findings

The programmes tie in with the faculty's and university's assessment policy. Based on these policies an assessment programme is drawn up by the programme director. The assessment programme provides an overview of the relation between intended learning outcomes, learning objectives of the courses and assessment methods. The programme director is responsible for the assessment processes. The examiner is responsible for the quality of the assessment.

Assessments are developed by examiners appointed for each course. Assessments need to show a clear relation to the learning objectives of the course and the didactic activities. Assessment matrices are used to relate the course objectives to the content of an assessment. The faculty aims for a bottom up implementation of the use of assessment matrices; the use of this is not mandatory.

Peer review is obligatory in constructing assessments. In practice this means that a colleague evaluates the exam questions, the accompanying answer models and the level of difficulty, before the exam is given. This is usually discussed in a meeting with the examiner involved. From the next academic year, the names of the examiner and the peer have to be mentioned on the front page of the exam.

Assessment methods used vary from written exams with multiple choice and open-end questions, essays, oral assessments, presentations and (practical) reports. Most of the first and second year courses also include mid-term and / or partial exams to encourage an active study mode amongst students.

Students are informed about the assessments in the study guide, the course manual and during the courses. The course manual also includes example questions. The students the committee met during the site visit are in general content with the level of the assessments. Students noted that the assessments in the first and second year include more and more open-end questions.

Examinations board

The faculty examinations board includes three sub-committees for the clusters Psychology, Education & Family Studies and Human Movement Sciences. The board consists of an independent chair, the three chairs of the sub-committees and an examinations expert. In the near future, a legal expert will be added to the board. The sub-committee consist of at least one staff member for each represented programme.

The examinations board is responsible for ensuring the quality, organisation and coordination of the assessments. The board investigates independently and systematically whether the assessment quality meets the criteria as defined in the faculty's assessment policy. For this, the sub-committee uses the student evaluations regarding assessment, pass rates, and the evaluation

and item analysis of multiple-choice exams. The board is also responsible for determining whether students meet the end qualifications of the programme and hence pays special attention to the procedures followed during the assessment of the bachelor's literature thesis and the bachelor's research project. In this regard the sub-committee checks the quality of theses and assessments by an annual sample.

The meeting with representatives of the sub-committee HMS and the examinations board during the site visit revealed that the examinations board meets with student representatives twice per year. These meetings are held to receive additional feedback that is not part of the regular evaluations. In addition, assessments results, evaluations and statistical analyses are used for monitoring the quality of the assessments. The sub-committee checks the grades of both assessors of the theses on coherence, reliability, average differences, standard deviation and limit of agreement. Calibration sessions regarding the level of theses are systematically organised. It was also made clear that lecturers are free to decide on how they provide their students with feedback on their thesis. This can be done orally or by using the assessment form. The examinations board ensures that assessors involved of theses work together in different compositions, to avoid permanent combinations of assessors. The board is currently working on the implementation of digital assessments and digitized assessment matrices.

Considerations

The committee concludes that an effective system of assessment is in place. The quality assurance of the assessment system is very solid, proactive and effective measures are taken to guarantee the validity, reliability and transparency of the assessments. The assessment programme, four-eyes principle and the systematic checks by examinations board all add to this. The committee appreciates that the full scale of grades is used by the examiners and students can obtain a 10.

Students are content with the level of and variation in assessments. In general, the level of the different assessments studied by the committee during the site visit was high. The committee also values the variation in assessment methods used. The committee encourages the programme to keep promoting the use of assessment matrices; this can contribute to the overall quality of the assessments and can ensure that more assessments address the application of knowledge.

The examinations board and its sub-committees are very well organised and safeguard the quality of the assessments in a structured and accurate manner. The committee appreciates the variety of analyses the board uses in evaluating the quality of assessments and theses.

Based on the above, the committee assesses this standard as **good**.

4. Achieved learning outcomes

Based on the studied documents and the interviews, the committee concludes that graduates of the bachelor programme HMS exceed the required level and the intended learning outcomes. The programme has a solid and comprehensive graduation process in place. The committee especially values that students write a literature thesis and conduct a research project. This ties in with the programmes main focus on educating academic thinking, reasoning and research skills. The committee concludes that the overall quality of the studied theses is high. The theses can match with theses from master's programmes. The theses studied were very well written and showed up to date research methods and analyses. The level of the programme was confirmed during the meeting with students and alumni, who seem to be well spoken and capable of creating their own career path within human movement sciences.

Findings
The programme is completed with the two capstone projects: the bachelor's literature thesis (6 EC) and the bachelor's research project (18 EC).
The thesis is an individual project, the research project is executed in pairs.

In the literature thesis students formulate interesting and relevant research questions and try to solve these by setting up a sound argumentation on the basis of original data in the literature. Students choose a topic themselves or one from a list of suggestions by their lecturers. Students are informed about the procedures during a meeting in the first semester. In that meeting students can make first appointments with future supervisors of their thesis. The thesis is assessed by the supervisor and a second assessor. The first assessor (supervisor) grades the thesis on scientific quality and the writing process. The second assessor only grades the scientific quality of the thesis (without knowing the grade of the first assessor) in a range of 1 point. When this range does not encompass the grade of the first assessor, the two assessors meet and usually reach consensus on the final grade. In the assessment of the theses, a go / no go moment is incorporated when students hand in the (final) draft version of their thesis.

In the Research Project students formulate a research question and answer this by devising an experimental setup and collecting, analysing and interpreting their own empirical data. Students also practice their communication skills in the interaction with their fellow students, supervisor(s), technicians, and ultimately in their final presentation.

Students can formulate a research question or topic themselves and formulate a concrete project with their lecturers. Students can also choose three subjects from an available list. Subsequently the research project coordinator allocates students to a project. The research project is assessed by the supervisor, and the presentation by the colleagues from the teaching programme.

For both the thesis and the research project, a contract is signed by both the student and the supervisor. The contract states the start and finish date, when concept versions are handed in etcetera.

As mentioned before, the programme primarily focuses on providing students with a solid academic basis, including (critical) thinking and reasoning skills. The majority of the graduates continue their education in a (research) master's programme in HMS. One third of the graduates find their way to master's programmes such as Neurosciences, Biomedical Engineering, Medical Engineering and Health Sciences.

The alumni the committee met, value the problem solving and academic skills they learned in the programme.

Considerations
The committee concludes that the programme has an effective graduation procedure in place. The committee especially appreciates the structure of the graduation phase, with an individual thesis and a research projects in pairs. This ensures that the different academic skills are addressed at end level. In addition, the literature review offers students the opportunity to research a topic of their own interest. This encourages in-depth study of literature.

The committee reviewed fifteen theses and research projects. The committee was impressed by the overall academic quality of the studied theses and research projects and concludes that graduates of the bachelor programme HMS exceed the required level. In general, the committee agreed with the grades given and concludes that the studied theses can easily compete with theses at master's level. The theses were well written, employ up to date methods and analyses, and provide well-founded interpretations considering the level expected from bachelor students.

Based on the above, the committee assesses this standard as **good**.

Appendices

Appendix 1 Assessment committee

Naam panellid (incl. titulatuur)	Korte functiebeschrijving van de panelleden (1-3 zinnen)
prof. dr. Gertjan Ettema	Gertjan Ettema is sinds 1998 professor aan de NTNU, Department of Neuromedicine and Movement Science, Faculty of Medicine and Health Sciences, NTNU, Trondheim. Zijn onderzoeksgebieden zijn biomechanics en (neuro)fysiologie in motor behaviour (in het bijzonder sport) en computer modelling van biomechanica en spierfunctie in coördinatie. Hij doceert en is curriclumontwikkelaar op het gebied van biomechanica, motor control en coordinatie op alle niveaus. Hij is sinds 2014 wetenschappelijk manager van Centre for Elite Sports Reseach en sinds 2013 section editor van Human Movement Sience (sinds 2010 editorial board member). Daarnaast is hij lid van de International Society of Biomechanics (ISB) en de European College of Sport Science (ECSS). In de jaren 2000 was hij professor II aan Norges Idretts Høgskole Oslo; in de jaren '90 docent aan de University of Queensland, Australië en de VU Amsterdam. In Australië heeft hij een cursus voor Problem-based-learning facilitator in the Medical Curriculum gevolgd.
prof. dr. Anton Wagenmakers	Anton Wagenmakers is sinds 2012 professor of Exercise Metabolism and Lead of Exercise Metabolism & Adaptation Research Group aan Liverpool John Moores University. Anton is voorzitter van de werkgroep curriculumontwikkeling BSc Sport and Exercise Science en moduleleider en examinator in de MSc Sport and Exercise Physiology. Daarvoor was hij 10 jaar lang als Professor of Exercise Biochemistry verbonden aan University of Birmingham, sinds 2008 als & Head of School of Sport & Exercise Sciences. In Nederland had hij van 2003-2007 een parttime leerstoel in Metabolic Control Systems, Faculty of Biomedical Engineering aan de TU/e en was hij tot 2003 verbonden aan de UM. Bij UM was hij tutor en examinator van bachelortheses en lid van voortgangstoets Beoordelingscommissie. Van 1999-2003 was hij lid van de Examencommissie BMT aan de TU/e.
prof. dr. Nicole C. Wenderoth	Nicole Wenderoth is sinds 2012 full professor Neural Control of Movement en directeur van het Institute for Human Movement Science and Sport, Department of Health Sciences and Technology, ETH Zürich, Zwitserland. Hier geeft zij leiding aan een multidisciplinaire onderzoeksgroep. Zij is lid van de ETH Onderzoekscommissie, lid van de Stuurgroep Neuroscience Centre Zürich, wetenschappelijk bestuurslid van zowel de Hochschulmedizin Zürich als van de European College of Sport Sciences. Zij treedt regelmatig

	op als reviewer van internationale fondsen en van journals op het gbeied van Neuroscience, Neuroimaging en Motor Control. Tot 2012 was zij verbonden aan KU Leuven als assistant professor. Zij is promotor van tot nu toe 20 afgeronde promotietrajecten en heeft meerdere wetenschappelijke prijzen in ontvangst mogen nemen, zoals in 2013 de Golden Owl for excellent teaching; in 2006 een professorship with specific research assingment (competitive position awarded for 10 years).
Vera L. Broek, student-lid	Vera Broek studeert Biomedische Wetenschappen aan LUMC en Klassieke Muziek aan Codarts University of the Arts. Zij is student-assistent bij microscooppractica in het LUMC en studentvertegenwoordiger in de minor Cellular Therapies in Biomedical Sciences. Zij treedt op als student-lid van visitatiepanels voor TNO's en was in 2016-2017 panellid ZonMw (Lyme Disease).
drs. Raoul R. van Aalst	Raoul van Aalst is bedrijfskundige van achtergrond. Na afronding daarvan is hij werkzaam geweest in zowel controllersfuncties als adviesfuncties. Sinds 2005 vervult hij de functie van controller bij Tennet. Sinds 2016 is hij programmamanager Always Energy, een gezondheids- en vitaliteitsprogramma dat erop gericht is om een gezonde levensstijl bij medewerkers te bevorderen. Hij is sinds 2004 frequent betrokken bij uitvoeren van visitaties in het hoger onderwijs, zowel in de rol van extern deskundige als in de rol van voorzitter. In oktober 2018 verwacht hij de module "Assessment in Higher Education" bij de Erasmus Universiteit Rotterdam (Risbo) af te ronden.

The panel was supported by Titia Buising, secretary. All panel-members signed a declaration of independence and confidentiality, which were submitted to NVAO.

Appendix 2 Programme site visit

Programme site visit VU Amsterdam, Forum 3 (1st floor, main building VU)

Tuesday January 22

12.00 -13.00 hours:	Arrival panel
13.00 – 13.30 hours:	Management
13.30 – 14.30 hours:	Guided tour
14.45 – 15.30 hours:	Examinations Board
15.45 - 16.45 hours:	Lecturers master programme Human Movement Science
16.45 - 17.45 hours	Students and alumni master programme Human Movement Sciences

Wednesday January 23

9.00 - 10.00 hours:	Lecturers bachelor programme Human Movement Sciences
10.00 - 11.00 hours:	Students and alumni bachelor programme Human Movement Sciences
11.15 - 12.15 hours:	Lecturers master programme Musculoskeletal Physiotherapy Sciences
12.15 – 13.15 hours:	Students and alumni master programme Musculoskeletal Physiotherapy Sciences
13.15 – 14.00 hours:	Lunch
14.00 – 15.-00 hours:	Lecturers bachelor programme RM Human Movement Sciences
15.00 – 16.00 hours:	Students and alumni RM Human Movement Sciences
16.00 – 18.00 hours:	Internal meeting panel
18.00 – 18.15 hours:	Feedback session

Appendix 3 Intended learning outcomes

Dublin descriptor	End qualifications of the Bachelor's programme Human Movement Sciences
Knowledge and understanding	1. Has knowledge of the current theories and insight in the present research questions in the field of movement sciences. 2. Can collect scientific information efficiently and is able to correctly interpret knowledge concerning HMS related subjects. 3. Can develop a research plan on the basis of an existing research question and/or hypothesis. 4. Has overview of research methods and techniques relevant for the field.
Applying knowledge and understanding	5. Has mastered experimental and analysis methods to conduct an investigation, in particular in the field of movement sciences. 6. Is able to efficiently and in consistency collect scientific information 7. Can apply HMS related knowledge on societal questions. 8. Can lay links between data coming from several fields of research. 9. Can think interdisciplinary, has insight in disciplines that are important for movement sciences.
Making judgements	10. Can assess results of research critically and on the basis of existing analysis methods. 11. Has insight in the scientific and social relevance of the current research in the field of movement sciences.
Communication	12. Can transmit scientific knowledge orally, using modern presentation techniques and coordinated on the public concerned. 13. Can present results of research in writing at the level of a professional journal and uses references correctly. 14. Is able to communicate at level with experts from several fields.
Learning skills	15. Is able to reflect on obtained knowledge and skills. 16. Is capable of evaluating its own functioning and own learning aims, both by self reflection and in conversation with others. 17. Is familiar with the general national and international journals in the field of movement sciences. 18. Can acquire information on the basis of scientific - and professional literature and analyse this information. 19. Can cooperate in interdisciplinary composed teams. 20. Has the skill to learn new knowledge and skills independently in a future situation within the framework of life-long learning.

Appendix 4 Overview of the programme

Appendix 5 Studied documents

The panel studied prior to the site visit theses of fifteen graduates with the following student numbers:
The panel studied during the visit the following documents (partly in hard copy and partly digital):

- Annual report Education of the Faculty of Behavioural and Movement Sciences 2016-2017
- Annual report Examinations Board FGB 2017-2018
- Annual report bachelor programme Human Movement Sciences 2017-2018
- Annual report of the Programme Committee 2017-2018
- Notes on meetings on establishment Examinations Board
- Notes on cluster meetings Human Movement Sciences
- Notes on educational meetings (FGB and programmes Human Movement Sciences)
- Notes on meetings with advisory board HMS
- Notes on meeting with chairs of the Programme Committees HMS
- Assessment Policy FGB
- Assessment programmes HMS
- Assessment forms thesis and research projects
- Teaching and Examination Regulations of the programmes of HMS
- List of used literature in the programmes of HMS
- Study guide of the programmes of HMS

Assessments and answering models of the following courses of the bachelor programme Human Movement Sciences:

- Inleiding Inspanningsfysiologie
- Biomechanica
- Neurowetenschappen
- Meten van fysische grootheden
- Regelen van lineaire systemen
- Theoretische achtergronden PMT