Development dialogue

Bachelor and Master Biomedical Sciences

Maastricht University – Faculty of Health, Medicine and Life Sciences

Utrecht, 15 May 2024

Present on behalf of the re-accreditation panel Biomedical Sciences:
- Prof. dr. Hans van Leeuwen, Professor Internal Medicine, Erasmus MC Rotterdam
- Prof. dr. Jan Eggermont, Professor Cell Physiology, KU Leuven

Present on behalf of the bachelor and master programmes Biomedical Sciences:
- Dr. Jan Theys (Director of Education Biomedical Sciences)
- Dr. Roger Godschalk (Coordinator Bachelor Biomedical Sciences)
- Prof. dr. Ronit Shiri-Sverdlov (Coordinator Master Biomedical Sciences)
- Dr. Guy Bendermacher (Policy Advisor FHML)

Introduction

Within the framework of the reaccreditation of UM's Bachelor and Master programmes in Biomedical Sciences, a development dialogue which followed-up on the accreditation panel's site visit (d.d. 25 and 26 January, 2024) took place on 15 May, 2024. The dialogue offered an opportunity for the programme management to ask for a further elaboration on the panel's findings, to gain advice on potential improvement actions, and to indicate which recommendations by the panel have already led to improvement initiatives in the period since publication of the accreditation report. The development dialogue revolved around the following topics:

- The offer of practical/lab skills training in the bachelor and master BMS
- Training in statistics, programming, data science and artificial intelligence
- Working relation between the Management Team and Board of Examiners
- Development of career skills and portfolio

Offer of practical/lab skills training in the bachelor and master MBS

Based on conversations with students and alumni, the accreditation panel signaled that in both the bachelor and master curriculum practical/lab skills training should be strengthened. The programme coordinators and panel representatives agree on a course of action wherein improvement efforts are not per se directed toward offering *more* practicals, but focus on critically reviewing and potentially changing the practical formats. Over the past two years, additional practical training opportunities have already been incorporated in the programmes; this might not have surfaced in conversations with alumni. The panel representatives welcome the initiative to conduct an inventory of the current practical training offer: the bachelor currently has a total of at least 430 hours of practical work (excluding the minors). This means that approximately 30% of the total contact time is allocated to practical training. For the Master, about 60% of the programme (including the entire year 2 dedicated to the internship) consists of practical work, which is considered sufficient. The generated overviews provide a better insight into the variation across courses (and specialisations in the Master), in terms of the amount of practicals offered, formats applied, and biomedical techniques covered and provides indications of where the practical offer should be altered. The panel members recommend conducting a survey among recent alumni to gain further insight into the fit between the practical skills taught in the bachelor- and master curricula, and skills needed on the labour market.

To address student concerns that they lack detailed knowledge of a large(r) variety of biomedical techniques, efforts are required to enhance student confidence as well. This can be achieved by explaining to students that the practical training offered in the programmes along with ample focus on development of soft skills will enable them to adept to the requirements from the labour market. It is key that students understand the broader context and logic of the bachelor and master programme and that graduates are able to convey the benefit of their competency-based education to future employers.

Training in statistics, programming, data science and artificial intelligence

The accreditation panel has recommended all BMS programmes in the Netherlands to strengthen training in statistics, programming, (big) data science, and artificial intelligence.

At the bachelor level, the focus should be on discovering the potential (and limitations) of new techniques (including AI) from a 'systems perspective': students should be capable of understanding the broader context in which new technologies and research approaches will be embedded. Herein, it is important that they are made aware of ethical aspects associated with the implementation of new techniques and gain insight into the way these techniques are used in biomedical sciences as well as in related fields (such as healthcare or environmental sciences). The panel representatives recommend exploring initiatives for making education more interdisciplinary. Cooperation with the technical universities of Aachen and Eindhoven could be promising in this respect.

With regard to embedding more attention to AI in education, the programme coordinators and panel representatives agree that the focus in the bachelor should be on an introduction of AI-supported software and techniques. As it is important for all students to discover the potential of AI, it would be best to integrate assignments in which aspects of AI are covered throughout several generic courses (instead of developing an elective or minor course on AI, which will only be attended by part of the student population). The panel representatives support the idea expressed by the bachelor coordinator to develop a longitudinal line for education in statistics, programming, data science, and AI. Creating such a longitudinal line would create opportunities to offering education on these topics in an integrated manner.

Anticipating on the accreditation panel's advice to provide more attention to data science in the master programme, the coordinating team has decided to prepare a (limited) curriculum revision: the second common course of the programme will be fully dedicated to statistics, programming, data sciences and linkages to AI. Part of the content of the current second course will be moved to/merged with the first course. In designing the new course, it is important that all master students are able to 'get on the same page' first (e.g. by introducing the course topics on a basic level), after which more in-depth knowledge can be gained. The risk that some students have more prior knowledge in statistics and programming is inevitable and should be accepted. Hence, students who miss prior knowledge in this area might have to work harder to catch up. Where in the bachelor, the focus should be on gaining knowledge and understanding of statistics, programming, data sciences and AI, in the master more focus should go out to their application.

The master coordinating team is encouraged to offer additional opportunities to students who have a particular interest in statistics, programming, data sciences and AI. To this end, the internship offer could be broadened with more (interdisciplinary) projects delving into these areas. The panel representatives recommend involving students in designing the new course.

Moreover, they advocate for an exchange of good practices in education and research employing or relating to AI models between Dutch BMS programmes. The offer of education in rapidly evolving biomedical techniques and data science approaches will go hand in hand with students feeling better prepared for entering the labour market.

Working relation of management team with Board of Examiners

The momentum of the re-accreditation process has been seized by the BMS management team to engage in a dialogue on quality assurance of assessment with the dean, scientific director, and Board of Examiners (BoE) BMS. The panel advice to determine shared priorities has already resulted in several concrete improvement actions/strategies, i.e. in formulating a programme-level assessment policy, a quality check of non-final exams, and a review of thesis assessment quality. The panel representatives emphasise the importance of following-up on BoE recommendations in a structured manner. Should priorities set by the BoE and management team differ, this needs to be clarified in constructive dialogue. The Director of Education is committed to further improve the working relation with the BoE and has taken initiative to schedule meetings with the BoE to discuss quality assurance of assessment at regular intervals.

Development of career skills

The accreditation panel commended the programmes for the way in which attention to career skills and labour market orientation are embedded in the curricula. At the master level, there could be more attention to personal development and individual choice opportunities. The programme is developing plans in this direction and strives to optimise the mentoring and portfolio system (e.g. by removing redundancy in reflection forms to be uploaded). In addition, a longitudinal line specifically related to "Career skills" (including incorporation of creative design thinking, in the context of a real life biomedical problem, group dynamics, exploring and entering the labour market) will be implemented in the master curriculum. The panel representatives highlight the importance of developing a clear vision (dot on the horizon) on desired programme outcomes and deem that individual/flexible learning pathways could be introduced to realise these outcomes and further enhance the student learning experience.