

Educational Evaluation 2020/2021

Reviewer report of the International
Master Programme in Innovative
Medicine, IMIM at Uppsala
University

Introduction

The review is based on the self-evaluation of the International Master Programme in Innovative Medicine, IMIM. The evaluation group performed a site visit October 5-7 2021, in which a well-planned information program was offered on the overall organisation of master programmes at IGP, the Medical faculty at Uppsala University and on the specific contents of the IMIM programme. During the site visit we were able to interview the programme coordinator, teachers and students. The evaluation board also performed online meetings before and after the site visit. This reviewer report summarises the findings and recommendations, where strengths, weaknesses and suggested improvements are described and organised within the 11 quality aspects defined by Uppsala University. The review was finalised in December 2021.

The members of the evaluation board were:

- **Margareta Krabbe**, Senior Lecturer, Biology Education Centre (Chairman)
- **Göran Andersson**, Professor, Swedish University of Agricultural Sciences
- **Erik Fries**, Professor emeritus, Uppsala University
- **Nicholas Foulkes**, Professor, University of Heidelberg / Institute of Biological and Chemical systems (IBCS), Karlsruhe Institute of Technology, Germany
- **Anna Metreveli**, Stockholm University (Student representative)
- **Tejas Sawant**, Royal College of Surgeons, Dublin, Ireland (Student representative)

Summary

The 11 aspects of quality

1. The evaluation board finds that the **International Master programme in Innovative Medicine (IMIM)** complies with the provisions of the Swedish Higher Education Act (SFS 1992:1434) and the outcomes described in the Qualifications Ordinance, Annex 2 to the Swedish Higher Education Ordinance (SFS 1993:100), as well as programme-specific objectives.

IMIM has a well-structured organization and provides both general and specialized knowledge within translational medicine and prepares the students for future work within the research, governmental or private sectors.

In summary:

We see many strengths of the IMIM programme, including:

- The programme attracts qualified first-choice applicants and selection procedures result in engaged and motivated students.

- The programme provides an excellent link to ongoing research and technology advancement in a number of relevant research fields in Sweden and abroad.
- The programme displays wide individual specialization possibilities for participating students through the different research focus areas offered at the partner universities.
- A good study environment is provided through the engaged programme organization, including national and international programme coordinators, programme committees, course coordinators, teachers and students and teacher administrative support.
- The programme provides an exemplary international environment through its mandatory Year 2 mobility and possibilities for thesis project in international settings, including several partner universities in Latin America. The funding provided for by the Erasmus+ programme including scholarships for mobility is a prerequisite for the sustainable internationalization of IMIM. Uppsala University should support the continued association of IMIM with Erasmus+.
- The programme provides unique curricular activities, e.g. Spring and Summer schools, the “BBB, *Bench to Bedside and Back*” longitudinal modules, which provide students with attractive training and knowledge in preparation for both academic and non-academic careers.
- Through the established IMIM university network, the programme is continuously developed to maintain the quality, intended learning outcomes and scientific-based teaching of the programme. It also is the ground for valuable exchange of ideas and network during and after the programme for students.
- The IMIM university network is a sustainability feature in that it allows for teacher’s exchange and common student recruitment strategies.

The evaluation group highlights the following potential areas for improvement and development:

- To ensure the fulfillment of expected learning outcomes and to guide students and teachers in the programme, we suggest the construction of a goal attainment matrix where the expected learning outcomes (skills and knowledge) are matched with programme courses and extracurricular contents of the programme. Both IMIM students and teachers can be actively involved in the construction and the development of the matrix.
- The BBB modules provide an important and unique feature of the programme. Programme description and syllabi should display content and expected learning outcomes as well as examination criteria. The BBB modules should be examined as credit-awarding activities to emphasize the importance of these unique features of the programme modules and to allot sufficient programme resources to the activities. Today, the modules are either integrated or offered as separate entities depending on the university. Student feedback indicates that the BBB modules are valuable, but adds to an already full schedule. Scheduling and a clearer positioning of the BBB modules in the programme syllabus might improve student feedback.

- The support of international students traveling to Uppsala University in non-study related matters such as health care/insurance, visa matters and more must be improved to alleviate unnecessary stress.

2. That the content and teaching activities are founded on a scientific basis and proven experience.

Strengths

The content of the programme ensures the coverage of multidisciplinary topics on a high scientific level. The added-on activities such as the Spring and Summer schools further elevate the learning activities and brings innovation and entrepreneurial skills to complement the scientific content of the programme.

We appreciate the overlap in programme content with the Master's programmes in Molecular Medicine and Medical Research to make more efficient use of resources and to allow for students in different masters programmes to interact and learn from each other.

The involvement of many industrial partners and start-ups contributes to the goals of the programme to prepare students for their future careers in non-academic environments. The programme provides excellent preparation of students for a scientific career in teaching "design of experiments, DOE" methods.

Weaknesses / Challenges

The multidisciplinary theme of the programme and the different educational backgrounds of admitted students also pose a challenge to provide all students an adequate level of training over such a broad area within a limited time frame. The students could potentially benefit from a mentor program to help students select courses and research areas for their first year and mobility university for the second year as well as location/research area for their thesis project.

We perceive that there is too strong a focus on cancer in the courses at Uppsala University and encourage the programme to include other important targets for translational medicine such as cardiovascular, autoimmune and infectious diseases.

The involvement and role of the industrial partners could be clarified and mentioned in informational materials as well as in the programme goals.

The research areas at the partner universities could be further described in the informational materials, i.e. the focus of education and research in the following areas at Heidelberg University: clinical trial studies, clinical research and treatment strategies.

3. That teaching focuses on the learning of students/doctoral students.

Strengths

The students have excellent possibilities to individualize their master education within the vast research areas comprising the courses in the participating partner universities. The teachers/instructors are researchers or represent industrial or entrepreneurial expertise.

The training in innovation to identify and solve problems by design thinking is valuable for student development independent of future career choices.

Activities and courses challenging students in multidisciplinary and multicultural environments provide attractive training for students.

The courses in Advanced Research training allow for practical and theoretical preparation for research with individual supervision and coaching.

The mandatory mobility programme further requires students to take responsibility for their education and the progress of their learning.

Weaknesses / Challenges

The many components of the programme including a plethora of choices for individual study plans could potentially confuse students and add to the pressure they might feel during such a training programme.

The international mobility program places extra demands on the students introducing challenges associated with the practicalities of studying in another country. For example, at Uppsala University, international students have faced non-study related problems such as dealing with health care costs for those not holding a Swedish civil registration number as well as not obtaining visa permits in sufficient time. We strongly suggest that the Faculty of Medicine at Uppsala University proactively supports the programme and international IMIM students to solve or alleviate these non-study related practical matters and so relieve undue worry in affected students and programme coordinators.

The importance of statistics and bioinformatics in medical research cannot be understated. We suggest a substantial problem-based real data analysis training module, including statistical methods such as R) and bioinformatics, for example training in Python, in the first course of the programme. Such a module will benefit students also in the Master's programmes of Molecular medicine and Medical research. We further suggest a more advanced research-linked support and training in statistics later on in the programme, either as a mandatory module in the research training or as part of the thesis projects. Uppsala University has a strong research base in bioinformatics/big data analysis, which can be tapped into for teaching and support.

The BBB modules 1-4, correspond to 4 ECTS each, and comprise an important addition to the programme's character and goals. The contents, learning outcomes as well as the contribution to final grades should be clarified in instructional materials. Feedback from students indicates that the BBB3 coinciding with other courses in the programme can be overwhelming. Scheduling and planning of this module might lower stress.

The clarifications might contribute to alleviate confusion and worry attributed to the modules as reported by students.

4. That the intended learning outcomes are examined using appropriate methods and in a legally certain manner, and that progression is ensured.

Strengths

The programme displays high-quality and broad assessment strategies in examination of learning outcomes. The use of peer assessment in some courses is appreciated and contributes well to learning.

The progression is ensured through well thought-through curricula and extracurricular activities.

Weaknesses / Challenges

The extensive contents and mandatory mobility of the programme are positive characteristics of the IMIM programme, but also poses challenges to participating students. Additional mandatory modules such as the *Professional training* (PT) module and the *Personal Development Module* in Heidelberg raise the question as to whether the students can accomplish the preparatory research training in an appropriate depth? Is the quality of the IMIM research preparation evaluated by students/supervisors?

The content of BBB4, although important, is scheduled at a time in the programme where students are active in research (degree project and internships), this should be taken into account when scheduling and examining this module. The BBB4 is not credit-awarding at Uppsala University as in the other partner universities, which it preferably should be.

Learning outcomes in curriculum Year 2 should be developed and clarified.

The different grading systems of participating universities pose a challenge for students. Clarification on conversions of different national grades should be easily available to students and participating universities.

The connections between different expected learning outcomes can be more clearly defined.

Progression in the programme could be clarified and developed by the use of a goal attainment matrix linking expected learning outcomes to teaching and training in the different courses and activities. Training in different skills can be identified and progressively developed throughout the programme. Students can be involved in identifying gaps or unnecessary recurrent activities. Teachers can be involved in the preparation of the matrix to match course contents with overall intended programme goals.

5. That staff involved in the study programme possess relevant and up-to-date expertise in the subject matter, that they have pedagogical and/or subject didactic expertise, and that there is sufficient teaching capacity.

Strengths

The programme presents engaged teachers who have a high scientific profile and who display pedagogic ambitions to provide active learning in e.g. the flipped classroom method. Additional expertise such as partner companies and entrepreneurial/innovation teachers and coaches appears well suited to accomplish learning outcomes with the students.

Weaknesses / Challenges

The teachers in the programme could benefit from didactic support in the form of yearly workshops to learn about research-based methods for teaching and instruction or in courses provided for by the Department of Education at Uppsala University or by other sources of didactic expertise. A request for support for such instruction could be directed to the Medical faculty.

The solid introduction and training in biostatistics and bioinformatics will require recruitment of suitable teachers and instructors. Expertise in big data analysis, bioinformatics and computer science is available at Uppsala University.

The expertise in training students in entrepreneurship and innovation modules should be recruited at Uppsala University to ensure sustainability of the BBB modules. Support by EIT Health for the IMIM programme may not persist.

External consultants and speakers should be wellinformed about programme content and goals to allow for effective contribution.

6. That internationalisation, international perspectives and sustainability are promoted.

Strengths

The international flavor of this course is impressive and is to be commended. Especially the number of non-EU students is an asset and unusual in many Swedish master programmes. This allows for excellent multicultural training of students, network building and global perspectives in teaching and learning.

The mandatory mobility supported in this Erasmus+ programme is an asset and adds substantially to the attractive training provided in this programme. The mobility adds generic skills to students and contributes to programme identity and networking between students.

Travel is an important ingredient of this programme and has clearly benefited the building of strong student networks and has made a major contribution to programme identity. The participation of Latin American universities in the IMIM university network further strengthens the already wide research areas and is clearly a very popular element in the programme.

Weaknesses / Challenges

The mandatory mobility raises many practical problems for traveling students. A guide/handbook to the logistics of moving to new countries may help to reduce problems with banks, health care, immigration etc. Documentation of the different experiences from alumni moving to new countries may help new students confront the challenges of moving to another country. A student concern is that the health insurance provided for to IMIM students is not comprehensive and does not for example include mental health. The health insurance is especially relevant for non-EU citizens hwho are not covered by European health insurance.

Funding for student mobility through Erasmus+ support and scholarships is crucial to sustainably maintain the internationalization of the programme and should be rigorously attended for.

Learning in advance the particular details of life in other national systems may also reduce time lost following transfer to a new training host location.

7. That a gender equality perspective is integrated into the study programme.

There is a gender imbalance in the IMIM programme and a majority of the admitted students are female. The programme should consider different approaches to balance the

gender distribution in the programme. Considering the difference in applicants' study background, is the gender imbalance in students starting their education in Heidelberg or Groningen similar as in Uppsala?

Students who become parents during their studies can obtain support at Uppsala University. Information about the support given by Uppsala University and the programme can be made available to students.

The Professional training (PT module) of the first course in the programme may include teaching on gender equality perspective, however, no other courses appear to have syllabi addressing gender equality.

A possibility for the programme could be to discuss gender differences in career paths, different international environments, choice of research areas, scientific attitude, planning and evaluation of research and more issues relevant to students. This would require academic support in discussing these matters.

8. That the study programme meets individuals' and society's needs for learning and professional knowledge and prepares students for future careers.

Strengths

The programme has a well-developed training and support for students preparing for different career paths. One strong feature is its support of students in building international networks. The programme also has excellent training in communication skills, which prepares students for careers in different professional environments.

A hallmark feature of the programme connects training in translational medicine with teaching and training in entrepreneurship and business skills.

Weaknesses / Challenges

The programme appears to open a great diversity of career paths, which might confuse students. Advice for new students joining the programme about which module choices would be appropriate for a given career path is missing. What happens if a student wants to change the contents of their course during the programme?

The programme seems well placed for the establishment of an IMIM alumni association supported by and a potentially an important asset for the programme.

The presentation of chosen thesis projects could be communicated to students, current and prospective as well as to others interested in the programme.

Some thesis reports could be presented in full as examples and be an inspiration for students preparing for research training or a thesis project.

One suggestion from the evaluation committee is to include a mentor or career advice contact in the programme to guide students, particularly at early stages, in educational or career choices.

9. That students/doctoral students have influence on the planning, implementation and follow-up of the study programme.

Student representatives are encouraged to contribute to programme development continuously and at different committees. Course evaluations appears *not* to be the most effective way to obtain feedback on teaching and learning of particular courses due to low response rates, but other instances, such as programme evaluations and student representation in the programme committee as well in the Medical Master council (representing all nine Master's programmes at the Medical faculty) allows the

possibility for students to influence development of their programme.

The “*Communication plan*” provides students with a link to raise concerns and complaints. The communication plan describes channels of communication between students and course and programme coordinators, directors of studies, equal opportunities representatives, the Head of Department and Student Union in order to resolve any study-related issues at Uppsala University. The Communication Plan is distributed to all students at the start of the programme and is displayed on the Studium web accessible to all students at all times.

The programme director and/or study advisor could meet with the IMIM students regularly, for example once or twice every semester, to address any concerns and to obtain feedback on the programme.

10. That all students and doctoral students are provided with an accessible and fit-for-purpose study environment.

Students appreciate the provided study environments and easy access to well-equipped research laboratories.

A designated student laboratory at the department would simplify the scheduling of experimental contents of the programme and allow for better fit for purpose instrumentation.

Support with language training and other study-related challenges for students is provided for centrally at Uppsala University.

11. That continuous follow-up and improvement of the study programme is carried out.

The established university network provides the IMIM programme with internal benchmarking and access to a wide range of expertise in research as well as in education. This allows for continuous development of current contents. The sufficiently different research foci of the partner university promise several perspectives in synthesizing and developing overall common programme goals.

Regular meeting with IMIM students could serve as input for small or larger development of the programme. Students can be encouraged to bring in suggestions for improvement in an anonymous programme box (digital or physical).

IMIM could serve as a good example to other Master’s programmes at the Medical faculty and Uppsala University in establishing sustainable networks with highly ranked non-Swedish universities enabling benchmarking and internationalization benefiting both students and faculty.