

## External evaluation report for the Master program of pharmacy at the University of Oslo (UiO) – December 2022

### Executive summary/ Key recommendations

This report presents the external evaluation of the Master program of pharmacy at the University of Oslo (UiO). The evaluation committee has reviewed the self-evaluation report as well as previous assessments, student evaluations, program plans, course plans, and various statistics provided by the Department of Pharmacy. We find the program in general to be of high quality and recommend that it is continued. However, we find some areas for improvement including the following key items:

- Consider adapting the education to Bologna process 3 + 2 years, where bachelors could be examined after three years
- Strengthen the teaching in statistics and big data
- Consider increasing the time for teaching in subjects related to clinical pharmacy and patient perspectives
- Increase the awareness among teachers of how to identify and help students with mental health problems
- Further develop the interaction with the labour market e.g. by having more people working outside the university affiliated part-time as teachers
- Develop more inter-professional learning activities together with physicians, nurses etc. This could be arranged, e.g. as workshops, participation in the daily work for other professions or joint lectures.
- Integrate the sustainability perspective more into the program's courses
- Prepare objectives for internationalisation that both formulate a purpose for internationalisation, quantify a target for annual student exchanges (outbound and inbound) and specify how this can best be achieved
- Consider increasing the specialisation of the program by offering more elective courses or setting up two parallel programs

Further suggestions are provided under each sub-section in the full report.

### Introduction

This report presents the external evaluation of the Master program of pharmacy at the University of Oslo (UiO). The program evaluation takes place regularly as a part of UiO's system for quality improvement. The External Evaluation Committee for this report was appointed in the beginning of 2022 and received information about the evaluation process at a meeting in Oslo in June 2022. Our assessment is primarily based on the self-evaluation report and other documents provided by the administration and teachers at the Department of Pharmacy. This included the previous external program evaluations (2017-2021), annual reports, student evaluations, program plans, course plans, and various statistics. We have also met representatives of teachers, program management and support functions during the initial meeting in Oslo and a follow-up meeting in the autumn. In these meetings, questions and issues identified in the evaluation process were further discussed. No current or previous students were interviewed, but the evaluation committee included a student representative.

All members initially read the self-evaluation and other documents provided by UiO. After the initial meeting in Oslo in June 2022, the committee communicated on several occasions via zoom and gathered again in Oslo in October 2022 to discuss key questions, additional material needed, and how to proceed the work to the final version of the report. Requested additional material was provided by UiO and further digital meetings were held to discuss findings and recommendations. We have also added material based on our own experiences.

The evaluation committee consisted of the following people:

- Bente Gammelgaard, professor of Pharmaceutical Analytical Chemistry, Department of Pharmacy, Faculty of Health and Medical Sciences, University of Copenhagen, Denmark
- Björn Wettermark, professor of Pharmacoepidemiology, Faculty of Pharmacy, Uppsala university, Sweden
- Ragnar Hovland, MSc Pharm, PhD, CTO at AdjuTec Pharma, Norway
- Emilie Bredal Eriksen, student at the pharmacy master program, UiO

The present program was initiated in the fall 2017 and the first group of students have now passed through the program and graduated this summer, and it is in theory possible to make a first assessment of the quality of the program. However, it is important to recognize that the last years have been very strange with the Covid-19-pandemic impacting the learning environment to a large degree. Consequently, the observations written in this report should be seen in this context. A separate analysis of the impact of the pandemic on the program and potentials for future digitalization of teaching is recommended.

We would like to express our thanks for the opportunity to review the pharmacy program in Oslo and we hereby submit our report.

## The program

The program fulfils the overall purpose of the study program of a five-year integrated master's program in pharmacy as described in the learning outcomes for the five areas of competence:

1. Pharmaceuticals and Health
2. Patient Safety and quality assurance
3. Communication, collaboration and inter-professional interaction
4. Pharmaceuticals and Society
5. Research, development and innovation

(Regulation on the national guideline for the pharmacy programs, bachelor's and master's degree in Pharmacy 2020). In addition, the requirements for study programs and academic environments are met (Chapter 2, §2-2 and §2-3 Regulations on the supervision of the quality of education in Higher Education (*Studietilsynsforskriften*), 2017).

### Curricula for Master of Pharmacy in other countries

The title «pharmacist» is regulated by the directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications. The directive sets common standards for pharmacy education in Europe, with the aim to promote cross country mobility for health professionals in the European Union. The directive states that a Master of Pharmacy should contain at least five years training, including:

- four years of full-time theoretical and practical training at a university or at a higher institute of a level recognised as equivalent, or under the supervision of a university.
- during or at the end of the theoretical and practical training, six-month traineeship in a pharmacy which is open to the public or in a hospital under the supervision of that hospital's pharmaceutical department.

Training for pharmacists shall assure that the person has acquired adequate knowledge of/to

- medicines and the substances used in the manufacture of medicines;
- pharmaceutical technology and the physical, chemical, biological and microbiological testing of medicinal products;
- the metabolism and the effects of medicinal products and of the action of toxic substances, and of the use of medicinal products;
- to evaluate scientific data concerning medicines in order to be able to supply appropriate information on the basis of this knowledge;
- the legal and other requirements associated with the pursuit of pharmacy.

There has been some harmonization within Europe over time, but there are still large differences between countries in structure and content of curricula. The PHARMINE-study conducted ten years ago showed a large variation in composition of different subjects between different European countries with, e.g., the proportion of the total study time dedicated to chemistry varied between 13% in Great Britain and 44% in Austria, pharmacology & therapy between 16% in Greece and 42% in France and societal subjects between 1% in Austria and 16% in Finland (Atkinson *et al.* Pharmacy 2014). During the last decades, the International Pharmaceutical Federation (FIP), emphasized the need to transform pharmacy educations from a traditional focus on drug discovery and production towards an increased focus on quality use of medicines in patients and the society.

There is also a large variation in structure and content between the Nordic countries. In Uppsala, Bergen and Oslo (UiO), Master of Pharmacy is provided as a five-year education independent from a three-year bachelor. In Copenhagen, Odense, Tromsø, OsloMet, Gothenburg, Umeå, Kuopio, Helsingfors and Åbo, pharmacy education is provided as suggested in the Bologna-process with 3+2 years. In Kalmar and Uppsala, independent three-year bachelor educations are provided. The variation in structure, curricula and learning methods provides an opportunity for learning and benchmarking within the Nordic countries. However, our experience is that our countries share the general problems of low number of applicants and high drop-outs. A joint Nordic collaboration focusing on this issue and how to strengthen the pharmacy teaching would be valuable.

## The topics and topics composition - Curriculum

The panel's evaluation of the academic content, topics and topics composition is primarily based on the very thorough and positive evaluations carried out by the previous panel, as described in the reports from 2017 to 2021 and information from the Committee on Education's self-evaluation and supplementary information.

The previous program evaluations can be summarized as follows:

*The program is very good and ensures the necessary education for Provisor pharmacists and Masters of Pharmacy. The academic structure and breadth of the topics is very good and, to some extent, advanced, as the students are introduced to academically advanced themes already from the first semester. The program appears well thought through, and the topics have good academic coherence*

and progression, where the subjects in the seventh semester contribute to linking theory and practice in the best possible way. Canvas has been developed to a fine learning platform, where it is easy to access the teaching resources.

The new study program has been completed for the first time in the summer of 2022. This means that the last academic year has not been evaluated by the previous panel. This is elaborated below.

## The academic content

The academic content is settled by the learning outcome descriptions (LUB) of the individual courses and the curriculum, and described in details by the syllabus. The learning outcome descriptions have been developed towards making concepts and expressions more uniform and specific. Focus was on highlighting the individual themes in the topics/courses such that the LUBs for the 1<sup>st</sup> to 7<sup>th</sup> semester collectively describe the content of the compulsory part of the program.

In the Bologna process of bringing more coherences to the higher education systems in Europe, it was recommended to divide course learning goals into *knowledge, skills* and *competences*. The achievement of these goals should be tested in the evaluation. This means that the individual course organizers communicate learning/reading instructions for reaching these goals replacing the syllabus. These recommendations are followed in the overall program, but not in the individual courses as the course descriptions follow the faculty's description. It appears from the self-evaluation that students focus a lot on whether exam papers are covered by the detailed syllabus. Changing to the Bologna system could perhaps reduce this inconvenience. Also, comparability with other European programs would be easier.

### **Evaluation panel's recommendation:**

- Consider adapting the education to Bologna process 3 + 2 years, where bachelor could be examined after three years
- Consider aligning course descriptions with Bologna system by dividing learning goals into Knowledge, Skills and Competences
- Replace detailed syllabus with expected learning outcomes

## Statistics and Excel

According to the report from the external program advisers, 2021, statistics is an important part of the planning of clinical Studies (FARM4120) in the seventh semester, while the course in statistics (FARM4130) is not given until the 8<sup>th</sup> semester. According to information from the Department of Pharmacy (FI), teaching on basic topics within statistics is also given in previous courses. In addition, FI considers to make the course FARM 4130 available on-line to help students who are on a stay elsewhere.

The previous program advisers recommended that the teaching should be more pharmacy-relevant and "the red thread" in the statistics teaching should be mapped. Furthermore, the competences in statistics at FI should be developed. FI states that the department has appointed staff members with expertise in Bioinformatics and Computational science, respectively, who may be involved in the teaching of statistics. In addition, the Department works with mapping digital elements/program products that form part of the current teaching. The use of statistics programs is included in the mapping.

The panel finds that the statistics teaching should be placed earlier in the program, as statistical methods are naturally included in the previous topics, or alternatively be divided into a basic course and a more advanced course.

There is a lot of focus on digitalization and “big data” and this is unavoidable becoming more and more relevant for patient treatment and interaction as well as drug development and surveillance. Understanding and handling these data amounts demands knowledge in statistical methods. This field is important for the pharmaceutical profession, and it could be considered to expand the teaching in statistics. In Copenhagen, a Digital Core Curriculum has become mandatory and a lot of work is devoted to implement elements of this in most teaching to make candidates “digitally educated”.

Introducing specific statistic related LUBs to the topics in which statistics are included would be beneficial, together with a compilation into a common statistics description, which all lecturers within the relevant subjects are made aware of. It is also important that students get an overview of the statistics teaching and where/when it is given.

It has also been mentioned that some students do not have sufficient competences in the use of Excel, even at the later stages of the education.

**Evaluation panel’s recommendation:**

- Consider placing the teaching in statistics earlier in the program
- Appoint a teacher responsible for the teaching in statistics
- Make examples in the teaching relevant for pharmaceutical sciences
- Describe the learning outcomes (LUB) for the entire teaching in statistics
- In case the teaching is given in smaller parts in the early courses, make LUBs of statistics visible in the course descriptions, and make an overview of the entire teaching in statistics available at Canvas
- Introduce a simple manual for use of Excel in Canvas and/or instruction videos and make it clear for students that this competence is crucial.
- Make exam questions (or other assessments) where students must demonstrate their skills in Excel

## Teaching formats and syllabus

Teaching formats are described in the *Framework for teaching*. The framework describes the minimum and maximum number of hours for organized teaching and self-study in the individual courses. Various teaching methods are used with a strong focus on student activation, which must comprise at least half of the teaching. In addition, it aims at distributing the students' workload evenly over the semester.

These common rules for all courses appear to be a suitable method to avoid that individual subjects seize too much of the students' time in relation to the whole (maximum number of lectures of 30-32 hours). It also encourages teachers to develop their teaching in the direction of more independent students. This is an example for others to follow.

## Assessment formats

A wide range of forms of assessment is implemented and oral exams are included in each semester. Parts of the assessment are based on compulsory work requirements, such as active participation and approval of reports. A practical exam is implemented in the pharmacy subjects and plans for introducing an objective structural clinical exam (OSKE) in pharmaceutical practice are developed. The previous panel has assessed that there is a good correlation between the LUBs and exam assignments on the first seven semesters.

The new initiative with OSKE is interesting. Both development of the teaching and the assessment formats are well worked through with a focus on student activation. At the same time, these new formats must lead to a significant increase in the amount of work for lecturers. For example, the introduction of grade-awarding sub-exams, which is very positive in relation to motivating the students to increase their efforts, but at the same time, it is very labor-intensive for teachers. In addition, semester committees have been set up for coordination and exchange of experience between the topics, and it has been proposed to make all of the topics to common use, by giving all employees access to all topics in Canvas. These initiatives are ambitious and admirable, but must result in much extra work. If there is no teaching staff extension, it may be necessary to prioritize these tasks.

## Censorship

Censorship is primarily conducted internally, especially in connection with written exams, while external grading is primarily used for practical exams (report 2020). This practice is in the report assessed to be beneficial for calibration of levels between the educational institutions.

It is rather surprising that there does not seem to be a need for calibration within the more theoretically oriented exams. Moreover, according to the report, it is important that the learning goals for the individual subjects all are passed. This raises the question of the criteria for passing the exam: must all learning goals be fulfilled, what are the requirements to fulfill the individual goals, and how are these criteria communicated to the students?

### **Evaluation panel's recommendation:**

- Map the workload of the teaching to avoid that staff get overworked and prioritize the teaching tasks to avoid that if lowering of the ambitions this will not happen randomly but after discussions on what efforts support most learning outcome for the students
- Define the passing criteria for the individual exams in terms of fulfilling the individual learning goals and all the goals

## Pharmaceutical practice

The 6<sup>th</sup> semester topic is pharmaceutical practice, where after the topics in the 7<sup>th</sup> semester are very practice-oriented (personalized drug treatment). Special practice periods (*SamPraks*), which is an elective, cross-disciplinary collaboration project between four faculties, allows for the development of inter-professional learning in clinical practice, and Student-driven hospital stay, where the students gain insight into the work as clinical pharmacist is another elective possibility. In the evaluation of these topics, the feedback from the previous panel is: *the topic is fantastic and very important in relation to the role as a pharmacist. The topic bridges theory and practice, and makes the students able to apply their knowledge from their studies in practice.*

This teaching was implemented for the first time in the spring of 2020, and the experience of teaching is therefore limited due to the Covid pandemic. However, the Department has developed a plan for making SamPraks compulsory in which additional professions are included.

These two offers of special practice schemes are interesting innovations and could be an inspiration for other study programs.

## Elective courses and master program

A total of 14 elective courses are provided within the master program:

1. Industrial Pharmacy
2. Clinical- and hospital-pharmacy
3. Pharmacy operation and management
4. Sports pharmacy and anti-doping
5. Applied pharmacokinetics and dosing in clinical practice
6. Clinical laboratory medicine
7. Advanced molecular and pharmaceutical microbiology
8. Drugs for treatment of degenerative and lifestyle diseases
9. Drugs for cancer and autoimmune diseases
10. Organic synthesis of bioactive compounds
11. The use of biopolymers in drugs and health improvement
12. New drug formulations
13. Pharmacoepidemiology and pharmacovigilance in practice
14. Bioanalytical chemistry: Advanced bioanalysis in health science

There is only sparse information about these courses. These were implemented in the autumn of 2021 and the first students following the new program graduated the summer of 2022.

The number of courses is relatively large.

Looking over the list of courses, some courses could probably be omitted and new introduced. It is important to meet the need for the future profession and also enable people who have graduated to participate as part of life-long learning. It could also be valuable to enable students of different professional background to participate. It is unclear to what extent this is done today.

### **Evaluation panel's recommendation:**

- Consider increasing the time for teaching in subjects related to clinical pharmacy, digitalization and patient perspectives.
- Introduce a more advanced course on statistics/big data
- Enable more inter-professional courses

## The professional environment

Requirements to professional environment (Lovdata §2-3) are assessed to be fulfilled. According to the self-evaluation, 35 scientific staff are employed who deliver 19 full-time equivalents of teaching/education. In addition, other scientific staff contribute approximately 12 full-time equivalents teaching. About 75% of the permanently employed staff are educated Masters in Pharmacy and all staff responsible for clinical and pharmacy practice have pharmaceutical backgrounds. Furthermore, two more scientific staff with expertise in Bioinformatics and Computational science, respectively, have recently been employed, who may be engaged in the teaching in statistics. Requirements for the size of the professional environment and educational professional competence are hereby considered fulfilled.

Professional management and organization – including development and quality assurance – take place via the Education Committee, the Program Council and the Continuing and Further Education Committee. Thus, the organization appears logical and fit for purpose.

Concerning pedagogical and didactic development of staff occupied in teaching, the faculty has a center, Competence Center for Teaching and Technology (KURT). This center offers courses with current themes, this year about sustainability.

Furthermore, the university appoints “Qualified teachers” when they fulfill certain criteria. Thus, there are fine incentives for developing the didactical standards, but only on a voluntarily basis. This may be an incentive for teaching development for the individual staff member, but probably appeals mainly to the teachers with special interests in didactics. Development of some more general requirements could be considered, for instance by introduction of teaching portfolios to be developed over time.

## Learning environment

The university of Oslo promotes learning and wellbeing through a range of activities for the students. This includes seminars for new students, older students supporting juniors and a range of student clubs. During the pandemic, specific student assistants were appointed to work with the student engagement and special activities were organized. The survey to students presented in the self-assessment show that students in general are satisfied with the program. However, the physical environment and use of digital tools are areas for improvement. The current facilities are old and offer limited opportunities to create better conditions for students, but the Department of Pharmacy (and Department of Chemistry) will move into a new building. It is unclear how students are involved in the planning. The limited skills in digital technologies were previously discussed with the panel. Some activities have been undertaken, but there is still room for further development.

The mental health is not described in the report. Reports from other universities show that almost five times as many students as 10 years ago report problems of depression and anxiety, and that the problems have escalated during the pandemic. It might be worth assessing this more in depth and offer education for students and teachers on how to provide support for students in need.

### **Evaluation panel’s recommendation:**

- Involve students in the planning of new facilities to ascertain a good learning environment
- Evaluate the use of digital tools during the pandemic and where it adds benefit compared to traditional campus teaching.
- Increase the awareness among teachers of how to identify and help students with mental health problems. It may be done, e.g. through seminars or practical tools. A system of letting each student have a regular mentor talk with teachers may be another possibility

## Relevance for the labour market

The labour market differs between the Nordic countries. In Norway, more than 80 percent of all pharmacists work in community or hospital pharmacies. In Denmark, around 60 percent are employed in the pharmaceutical/life science industry, around 20 percent at pharmacies and remaining 20 percent in authorities and universities. The Swedish labour market is similar to the Danish.

The future is bright for pharmacists in all Nordic countries with a growing focus on life science. Pharmacists can work in the pharmaceutical industry with clinical trials, regulatory affairs, quality assurance and medical information. Future predictions indicate that online deliveries for pharmaceuticals may reduce the need for pharmacists in community pharmacies, while there is expected to be a larger need for clinical pharmacists working in hospitals, primary healthcare centres and municipalities. To meet this development, clinical pharmacy skills need to be expanded in the



education. It may include training in individualization of drug therapy, drug utilization reviews, patient safety, pharmacovigilance and communication.

It is also important to facilitate interaction with the labour market and inter-professional learning activities early during the pharmacy training as well as providing more external master theses. The study visit program in collaboration with the industry as described in the self-evaluation is ambitious and may widen the students' perspectives on their profession. There seems to be less interaction within the master theses.

**Evaluation panel's recommendation:**

- Further develop the interaction with the labour market e.g., by having more people working outside the university affiliated part-time as teachers
- Offer more external master theses and develop a platform where companies and healthcare organizations can present themselves for the students and offer external master theses.
- Develop more inter-professional learning activities together with physicians, nurses etc. This could be arranged, e.g., as workshops, participation in the daily work for other professions or joint lectures.

## Sustainability

There is an increased focus on sustainability in the entire society. Sustainable development can be defined as development that meets today's needs without jeopardizing the ability of future generations to meet their needs (Brundtland Commission 1987). Sustainability is usually described in three dimensions – economical, social and environmental - all are equally important for the development towards a sustainable future. Pharmaceuticals are highly relevant from all these perspectives:

- **Economical.** A large number of new drugs and medical devices will be introduced into healthcare, several of them will be very expensive. Together with an increased need due to an aging population, this will challenge the economy in healthcare. Dealing with this requires knowledge of biological medicines and Advanced Therapy Medicinal Products (ATMP), but also health economics, Health Technology Assessment (HTA) and ethics.
- **Social.** Many new medicines pose a challenge also from an equitable point of view. There are socioeconomic differences in health seeking behavior and patient involvement as well as affordability and willingness to pay. There will likely be increased discussions in the media and society about differences between different patient groups, regions and countries in access to medicines and medical devices.
- **Environmental.** Medicines are designed to affect biological systems and several of them are long-lived in the nature. In recent years, pharmaceuticals in the environment have attracted more attention and there is a movement towards a more "environmentally friendly" manufacturing, distribution and use of pharmaceuticals. It requires knowledge of ecotoxicology and of various tools to promote sustainability, e.g. in drug development (benign-by-design), drug formulation, regulatory decisions and procurement, guidelines and pharmacy services (green pharmacy).

There seems to be limited focus on sustainability in the current pharmacy curricula and we therefore propose this to be integrated more into the program's courses.

**Evaluation panel's recommendation:**

- Integrate the sustainability perspective more into the program's courses. The students should be involved in discussing sustainability and how they can contribute during their studies and in their future working life.
- Consider developing a course early in the program on sustainable drug use where concepts such as the sustainability goals, one health approach and the environmental impact of drugs are covered

## Internationalization

In the Bologna process, it is an ambition that 20 percent of the students will go on an exchange abroad during their studies, and the Norwegian Government has a long-term goal that half of the students will go on such an exchange (Meld. St. 7 (2020– 2021) *En verden av muligheter - Internasjonal studentmobilitet i høyere utdanning*). The panel has not been able to identify numerical objectives for international educational cooperation and student mobility, neither for the Department of Pharmacy nor for the University of Oslo as a whole.

The new program facilitates international exchange in the 8<sup>th</sup> and 9<sup>th</sup> semesters to take individual courses and to carry out a research project in the 10<sup>th</sup> semester. All students are encouraged to go on exchange during their studies. The possibility of taking individual courses abroad is new, and it is still too early to evaluate the effect of this change on the number of students traveling abroad. Statistics on international exchange for the years 2006-2021 show that there is a large untapped potential for such exchange. Only 18 students chose to travel abroad during these 16 years. The same statistics show that during the same time period, 69 foreign students stayed at the Department of Pharmacy for a period, mainly to carry out research projects.

Another internationalisation activity that could be considered by the department is shared digital courses with foreign universities. This may be organised by inviting foreign students digitally to already established courses, identify courses at foreign universities that students may participate in or to jointly develop courses with foreign collaborators. The recommendation to develop a course in sustainable drug use (mentioned above) could be an opportunity for such an activity e.g., in collaboration with other Nordic universities. The digital transformation experienced during the pandemic has opened a well of opportunities for such activities. This has the advantage that it may offer both the students and the staff international experience without having to go through the somewhat laborious preparations for travel and admission to foreign universities.

**Evaluation panel's recommendations:**

- Prepare objectives for internationalisation that both formulate a purpose for internationalisation, quantify a target for annual student exchanges (outbound and inbound) and specify how this can best be achieved.
- Intensify the work on entering into exchange agreements with foreign universities. In particular, the focus should be on obtaining more agreements with universities with an English-language offer.
- Establish a platform/forum for international exchange. This should be responsible for information about exchange, host meetings with previous exchange students and invite companies to emphasise the advantage of international experience.
- Consider developing joint digital courses with foreign universities e.g., in sustainable drug use.

## Recruitment and throughput

The panel was asked to provide input on recruitment measures and whether the profile of the study program should be sharpened in some direction to attract good applicants, as well as to propose measures that can help prevent students from dropping out of the studies. The panel finds it difficult to evaluate the effects of the new program on both recruitment and throughput, both because the time since implementation of the program has been short and because of the challenges experienced during the pandemic.

The number of applicants to the program has remained steady at approximately 950 in recent years, while the number of available places has increased to 78. The grade-limit for admission is increasing. Admission is handled by "*Samordna Opptak*", and the department has little or no influence on the criteria used. There are joint requirements for upper secondary school science subjects to be passed for the pharmaceutical, medical, dentistry and clinical nutrition programmes.

For admission to the study, Norwegian skills are required according to GSK (*Krav til norsk og engelsk -Samordna Opptak*). A common concern that students without sufficient knowledge of Norwegian are admitted to health profession programmes at UiO has led to the initiation of an initiative to ensure that everyone who is admitted to such a programme has the necessary Norwegian language skills. This initiative should be closely followed up by the department.

According to "*Studiestartundersøkelsen*" (2019 and 2021), 70-80% of the students who are admitted to the pharmacy studies plan to complete it, while the target for the department is 90% throughput. It is worth looking into if the target is set too high. Our experience is that similar programs in the other Nordic countries struggle with the same challenge of retaining students. It may, however, be worth to initiate a study or survey to evaluate the reasons for dropping out of the program. This could help to identify measures to increase the throughput.

In the self-evaluation report, clear trends are described as to which groups of students have the highest probability of completion (younger students, students with high grades from upper secondary school, students with high grades in Norwegian from upper secondary school and women). The panel realizes the department's limited opportunities to influence the admission criteria but will nevertheless encourage work to be initiated to increase the quota for students admitted with a first-time diploma from the current 50%.

During the evaluation panel's work a discussion has been initiated in Norway on the criteria for admission to higher education in general. Relevant suggestions have been to remove the possibility of earning points for age, to remove the possibility of repeated exams in subjects from upper secondary school and to implement an entrance exam for higher education. The evaluation panel finds this discussion interesting and urges the department to engage in this discussion.

The self-evaluation report describes strict regulations of outward-directed recruitment initiatives under the auspices of the department, in order to limit competition between programs at the faculty. This does not appear to the panel as appropriate. Competition for the best students is in our view healthy. In the absence of in-house recruitment activities, the department is encouraged to establish contact with organisations, companies and key opinion leaders within the Norwegian pharmaceutical community in order to establish a recruitment campaign under external auspices. It is recommended that such a campaign strives to showcase the full range of possibilities for newly graduated pharmacists.

Measures to increase the throughput, apart from recruitment, may be considered. For instance, adapting a Bologna-process 3+2 model, as discussed above, should increase the throughput, as new students may be recruited to replace dropouts after the third year. Another measure that is worth pursuing is increased specialisation. A program for students that do not intend to work in

pharmacies could contribute to retaining this group of students. This may be organized with common subjects during the first year(s), followed by a higher number of elective courses later in the study, or by two completely differentiated programs.

**Evaluation panel's recommendations:**

- Follow up on the initiative to ensure appropriate Norwegian-language skills among the admitted students.
- Consider initiating a study or survey to evaluate why students are dropping out during the program.
- Initiate activities to increase the quota for students admitted with a first-time diploma from the current 50%.
- Contact organisations, companies and key opinion leaders within the Norwegian pharmaceutical community in order to establish a recruitment campaign under external auspices.
- Reconsider adapting the Bologna-process 3+2 model
- Consider increasing the specialisation of the program by offering more elective courses or setting up two parallel programs.

## Conclusion

The evaluation panel recommends that the program is continued, but that the department thoroughly reviews the recommendations from the evaluation panel.

21.12.2022

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