EUROMA – critical factors for achieving high quality in MSc programmes from Sweden, Flanders, the Netherlands and Norway

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Name of Author(s)

Stein Erik Lid
Stephan Hamberg

Contact Details

Stein Erik Lid
The Norwegian Agency for Quality Assurance in Education - NOKUT
P.O. Box 578
1327 Lysaker
Norway
E-mail: stein.erik.lid@nokut.no

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Abstract

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What matters for achieving high quality in MSc education? The quality assurance agencies in the Netherlands and Flanders (NVAO), Sweden (UKÄ) and Norway (NOKUT), together with a total of 16 MSc programmes in Economics and Molecular Biology from the Netherlands, Belgium, Sweden and Norway, have developed a methodology to and carried out a pilot project to address this question. We argue that the methodology constitutes a valuable supplement to traditional programme evaluations, because it also provides a programme-driven platform for discussions and sharing of experiences, self-reflections, practices and ideas.

Presentation

EUROMA – critical factors for achieving high quality in MSc programmes from Sweden, Flanders, the Netherlands and Norway

Introduction

Key questions in track 2 are: *How can key stakeholders enhance cooperation to arrive at shared understandings of quality? Can the epistemological rift between accrediting agencies and faculty be repaired? And what role can universities play in bridging this gap?* This paper describes the results from a collaborative project between quality assurance agencies and higher education institutions in Norway, Sweden, Flanders and the Netherlands. Faculty members and students from a number of study programmes, QA agencies, and external peer experts collaborated in order to reach a shared understanding of critical quality factors for high quality master level education. In addition to identifying critical quality factors, the participants shared their best practices for achieving high quality education across programmes and countries. In order to reach these goals, a new methodology was developed that is not linked to existing external and formal quality assurance processes in any of the participating countries. The methodology combines elements from both formative evaluation and benchmarking.

We organize the paper as follows: First, we provide some background for the project, we then discuss the methodology we developed. Third, we present some results from the project and we conclude with some general reflections about the merit of the project.

Background

The project was commissioned by the Norwegian Ministry of Research and Education. The original commission from the Ministry stated that the project should both develop a methodology for benchmarking the quality of similar programmes across European countries, and examine whether the quality of Norwegian MSc programmes is at an international level. In order to carry this out, NOKUT invited quality assurance agencies in Denmark (DAI), the UK (QAA), the Netherlands and Flanders (NVAO) and Sweden (UKÄ) to collaborate on developing a project addressing these goals. It quickly became apparent that neither the invited quality assurance agencies, nor study programmes in their respective countries, voluntarily wanted to participate in a project involving a comparative summative assessment of the quality of individual programmes, thus validating the key questions for track 2 highlighted in the introduction.

The different contexts of national policy and formal quality assurance schemes in the different countries significantly influenced the development of the methodology and participation in the project. In the fall of 2015, the Danish government announced significant budget cuts for the higher education sector. This led to a climate of distrust between the Danish HEIs and the authorities, and a general unwillingness among Danish HEIs to take part in further non-obligatory evaluation projects. Thus, DAI found that there was no support for the project among Danish HEIs and therefore withdrew from the project. In the beginning of 2016, QAA also withdrew from the project. The primary reasons were that their contract with the Higher Education Funding Council (HEFCE) to carry out quality assurance of higher education in England was discontinued, and that English HEIs and programmes at the same time had to respond to the introduction of the Teaching Excellence Framework (TEF).

In Norway, the quality assurance schemes have never involved systematic re-accreditation or direct evaluation of the quality of all study programmes. To this end, the Norwegian ministry's suggestion to initiate a project with the purpose of examining whether Norwegian programmes hold an international quality level through benchmarking appeared to be a natural choice. In contrast, formal quality assurance in Sweden, Denmark, the Netherlands and Flanders have until recently included systematic re-accreditation or evaluation of programmes where the quality level was assessed by international peer-review panels. A comparative summative evaluation or benchmarking of the quality at the programme level therefore appeared redundant and unattractive in these countries.

Rather than drop the project, NOKUT and UKÄ and NVAO redefined the goals. Thus, the project would rather focus on quality development by identifying critical quality factors and facilitate discussions and sharing of knowledge and good practice between participating programmes. In order to secure the participation of study programs from Sweden, the Netherland and Flanders it was also necessary to make it clear that the project should not be connected to formal quality assurance processes in any of the participating countries.

A critical quality factor is an element (practice, resource, input etc.) that is particular important to achieve a high quality education program. To identify a range of critical quality factors we asked the participating programmes the following question: "What elements (practices, resources, etc.) do you consider particularly important for achieving high quality in master programmes in your subject?"

The project included Master programmes in Molecular Biology and Economics from eight universities (Table 1). Throughout the project, the participating programmes were represented by students and faculty members. In addition to the programmes, two expert teams, representing academic peers and students in Economics and Molecular Biology respectively, also participated.

Table 1. Participating Universities.

Molecular Biology	**Economics**
Lund University	Lund University
Uppsala University	Uppsala University
University of Gothenburg	Tilburg University
VU Amsterdam	University of Amsterdam
Wageningen University	University of Antwerp
Joint Interniversity programme (VU Brussels, KU Leuven, University of Antwerp)	University of Oslo
The Norwegian University of Science and Technology	University of Bergen
UiT – The Arctic University of Norway	The Norwegian University of Science and Technology

Methodology

Evaluation uses inquiry and assessment to determine the criteria or standards for judging quality, collecting relevant information, assess the quality, and finally to provide recommendations (Fitzpatrick et al., 2012). Evaluations are carried out by evaluators who take on different roles throughout the course of an evaluation, depending on the intended evaluation outcome and their mandate (Weiss, 1998). Evaluations can be both internal and external. Internal evaluations are conducted by programme representatives, whereas external evaluations are conducted by outsiders (Fitzpatrick et al., 2012).

Evaluation theory distinguishes between formative and summative evaluations (Scriven, 1967). The primary purpose of formative evaluations is to provide information for programme improvements, whereas the primary purpose of summative evaluations is to provide information for judging the programme's quality or making decisions (Scriven, 1991). Summative evaluations are used formatively when the results are used to guide or change processes on order to improve the program, and formative evaluations can be designed to have a summative function. However, in this project we did not design an evaluation method with a summative function. Evaluations can also serve other purposes beyond the formative and summative, e.g. participation in evaluations processes may lead to reflection and learning and thus be an important outcome in itself (Patton, 1996).

Benchmarking is an alternative to evaluations where one compare one's performance or results to peers on agreed upon indicators or practices (Dakkatumar and Jagadeesh, 2003). One strength of benchmarking is that the process, in addition to identifying one's performance compared to others, readily identifies the best performance or best practice among the participating peers, which then serves as inspiration for improvement of performance for the other peers.

The methodology developed for the EUROMA project combines elements from formative evaluation and benchmarking. The key elements of the methodology are that the participating programmes first contributed to identifying critical factors for achieving high quality subject-specific MSc education, and subsequently reflected on their own goals and practices related to these quality factors together with peers from other programmes and external experts. The methodology included meetings and discussions between programmes, which served to highlight common critical quality factors, as well as facilitated comparisons of practices and sharing of knowledge and experience between programmes. Thus, the elements from formative evaluation allows identifying critical factors for achieving high quality and facilitates self-reflection and learning among the participants. The elements from benchmarking allows the participating programmes to compare strategies and practices to identify examples of good practice. The methodology incorporates both internal and external evaluators. Programme representatives act as internal evaluators when identifying, assessing what are the critical quality factors, and their own strategies and performance related to those factors, but also act as external evaluators when subsequently challenging and assessing the strategies and performance of the other programmes. The expert panels act as external evaluators by challenging the programmes to reflect on critical quality factors, their own practice and assessing what constitutes good practice and relevant indicators related to these factors. The expert teams have also performed comparative analyses at various stages during the project, highlighting differences and similarities between countries and programmes as a baseline for identifying the most important quality factors, common strengths and challenges, and addressing important areas for further development of high quality. Table 2 shows a schematic overview of the process.

Table2. Schematic overview of the methodology for the project.

Step	Task/event	Involved	Comment
1	The programmes submit self-presentations	-Programmes	The self-presentation contains three parts, where the programmes are asked to: • Highlight elements and practices they consider vital for high quality of master education within their subject field. • Describe areas of quality and/or practices where they consider they do especially well. • Key facts that describe their programme such as number of students, learning outcome descriptors, programme structure and assessment of master thesis/project/dissertation. Where possible, factual information were filled in by the national agencies. The primary purpose of the self-presentations is to share information between programmes and experts as part of the preparation for the national seminars (step 3). Documentation will not be required. The self-presentations should be kept short and sharp (maximum 5 pages).
2	National subject specific seminars/work-shop (one day in each country)	-Programmes (1 seminar each) -Expert panels (3 seminars each) -National QA agencies acts as secretaries	The programmes within the same subject field and country together with the expert team meet and through discursive processes arrive at 'national' critical factors for achieving high quality master's programmes in a given subject. The expert teams attend the seminar in every country. Their role is to facilitate the discussions and challenge the programmes to pinpoint which factors are critical for high quality.
3	Preliminary quality profile reports	-Expert panels (one report each) -NOKUT	Two reports (one for each discipline) where the experts compare and comment on differences and similarities between programmes and countries. Based on the self-presentations and the discussions at the national seminars, the experts also

		(secretarial assistance)	develop a list of across-country subject specific critical quality factors that the programmes will compare themselves against in phase 2.
4	Programmes' self-reflection	-Programmes -National agencies	Self-reflection in the form of a strength/weakness analysis and examples of good practice against subject critical quality factors from phase 1. Self-reflections are kept short and to the point, and supported by documentation only as necessary. Documentation that already is available through national register databases or recent quality assurance processes will be compiled by the QA agencies to lessen the administrative burden for the programmes.
5	Analyses of self-reflection	-Expert panels	Expert teams' introductory analysis of submitted self-reflections, with the purpose of preparing questions for the seminars in step 6.
6	International seminars (One day gathering all programmes in each subject field)	-Programmes (1 seminar each) -Expert panels (1 seminar each -National agencies acts as secretaries	Expert teams will facilitate discussions between programmes on their strengths and weaknesses related to the international subject specific critical quality factors, as well as sharing good practices. The discussions will be organised as workshops and presentations. They will have the character of a peer conversation and seeks to clarify and highlight how strategies and practices reflect subject specific critical quality factors.
7	Final report	-Expert panels -NOKUT , UKÄ, NVAO (secretarial assistance) -Programmes	Experts' final analysis of the output of the project in the form of a published report, presented in terms of discussions of characteristics between programmes and countries, strengths and weaknesses, areas for improvement, and good practice, in relation to critical quality factors. The emphasis will be comparisons and discussions of strategies and practices rather than individual programmes. The programmes comment on factual errors before publication.

Results

We divide the outcomes of the project into three categories. First is the development of the evaluation method, which was described above. Second is the identification of critical quality factors, and an analysis of the major differences between countries, study programmes, and disciplines. We also discuss some of the strengths and weaknesses of different strategies and practices related to the critical quality factors, as well as examples of good practices. The third category related to the self-reflection, discussions and sharing of experiences, practices and ideas among the participants.

Critical quality factors

As described in the introduction, the term "critical quality factor" used in this report is the answer provided by the programmes on the following question*: "What elements (practices, resources, etc.) do you consider particularly important for achieving high quality in master programmes in your subject?"*. Based on the programmes' self-presentations, self-reflection analyses and discussions at the seminars, the participating programmes together with the group of experts identified several factors that they agree are critical for achieving a high quality in MSc education across the participating programmes. Due to space constraints, we briefly discuss some of the findings for Molecular Biology in this section. A more detailed discussion can be found in the reports from the project (NOKUT, 2017 a and b). The identified quality factors for Molecular Biology the can be grouped in four different areas, as shown in Table 3.

Table 3. Areas of critical quality factors.

Programme design	Structure, organisation and flexibility
Scope and content	Multi-/interdisciplinarity
	Internationalisation and mobility of students
	Integration of new scientific or technological knowledge and trends
	Employability and transferrable skills
Input factors	Recruitment of motivated and talented students
	Teachers as quality factors
Learning processes and assessment	The master research project(s)
	Assessment of master research projects
	Innovative teaching and learning formats

Programme design

Structure,organisation and flexibility

The participating programmes are differently designed, but generally more similar within countries than between. Some programmes are designated Molecular Biology programmes, whereas others are designed as specializations within broader Biology programmes. The majority of programmes are 120 ECTS entities building on a 180 ECTS bachelor degree, but certain programmes in Norway are so-called integrated master programmes constituting 300 ECTS, combining the bachelor and master.

Flexibility for students to choose tracks, modules or courses in order to specialise according to their interests was generally viewed as a critical quality factor, but the degree of flexibility varies between programmes and countries, with the Swedish students typically having the most flexibility. Flexibility also poses some challenges. For programmes with compulsory modules following a set curriculum, content, learning outcomes and progress are more easily monitored than in highly flexible programmes. There is also a risk of designing a suboptimal programme because the students have a limited overview of the field at the time they have to make their choices. Highly flexible programmes are also more challenging with respect to securing that students obtain the proper theoretical- and practical skills sets to prepare them for different careers. A particular challenge in highly flexible programmes is the monitoring of training and learning outcomes related to transferrable skills. To secure these learning outcomes, it is necessary to coordinate relevant training between teachers responsible for the different courses.

Scope and Content

Multi-/interdisciplinarity

Molecular Biology students should be exposed to multi-/interdisciplinary work, since both reflect how frontline research is carried out, and are also important for the labour market outside academia. Some programmes explicitly aim at educating students with interdisciplinary and multidisciplinary research skills; these skills are part of the learning outcomes of these programmes. For the other programmes, inter- and multidisciplinarity is mainly achieved by providing opportunities for choosing elective courses or master research project supervisors from different departments. The project concluded that some degree of multi- and interdisiplinarity is clearly a critical quality factor. A minimum requirement must be that the students are able to understand and effectively communicate with researchers from related disciplines.

Internationalisation and mobility of students

High quality programmes need to recruit international students and provide an international atmosphere. Several programmes find it challenging to identify and recruit the most talented students from abroad. Different grading systems and variable trust in recommendation letters and other means for assessing the applicants' competence, complicate the selection process. This is even more difficult for some of the

Norwegian programmes where the main teaching language is Norwegian. The project found that one disadvantage with the integrated master programmes found in Norway is that it could hinder internationalisation and student mobility because they are designed to keep the students for the whole duration of their 5-year degree, and are often given in Norwegian.

Internationalisation and mobility of students is not only about recruiting international students but also about providing opportunities for students to get international experience abroad through student exchange or other means. It seems that this is prioritised to a larger extent among the Norwegian programmes that have a lower share of international students than the programmes from Sweden and the Netherlands and Flanders having high shares of international students.

Integration of new scientific or technological knowledge and trends

Using research-active teachers is the most effective way of keeping up to date and introducing the students to new scientific and technological knowledge. However, one should keep in mind that researchers are most updated in their own research field, which normally is far narrower than the scope of a master programme. The overall programme design should therefore be such that it combines teachers with different backgrounds and research focus. The programmes find that it is a challenge to fit newer topics or techniques, such as high-throughput technology and analysis of Big Data, into the programmes. More flexible programmes have the advantage that it is relatively straightforward to develop new elective modules or courses without having to redesign parts of the programme. In less flexible programmes, new developments will have to be integrated in existing courses or by development of new study tracks.

Employability and transferrable skills

To educate employable candidates is an obvious goal for all participating programmes. There appears, however, that there is more variation between the programmes from the Netherlands and Flanders in terms of goals and means for achieving this, than between programmes in Norway and Sweden. The Norwegian and Swedish programmes state that their goal is to educate candidates for PhD positions and academic research, as well as research, consultancy and management work in industry and the public sector outside academia. This is mainly achieved by integrating relevant elements of both research training and transferrable skills into courses and student projects. The programmes from the Netherlands and Flanders more specifically aim at educating their candidates for different careers. Certain programmes focus primarily on educating candidates for PhD and research positions, whereas others provide different career preparation clusters from which students can choose.

Molecular Biology graduates should have training in transferrable skills, such as scientific writing and presentation, data handling, statistics, ethics, teamwork, project management and so forth. The project concluded that in order to prepare students for all types of relevant careers, programs should embed the training of transferrable skills in the programmes, and the training should be framed within the scientific content of courses, rather than set apart from it. Programs should make a conscious effort to ensure that they do not treat these skills as tacit outcomes of attending lectures and working in a laboratory. For example, the inability of new graduates to work effectively in a team is frequently cited by industry as a critical skills gap. It is a transferable skill that makes graduates more employable, but is complicated by the fact that students beyond undergraduate level are often taught to work independently. In order to strengthen this focus, programs should also ensure that transferable skills are directly assessed and expressed in the overall mark when possible.

Input factors

Recruitment of motivated and talented students

Recruitment of a critical mass of motivated and talented students has to do with several factors, some of which the programme can directly improve in the short term. These are typically factors that will increase the quality and the attractiveness of the individual programmes, as well as measures to amend knowledge gaps, admission requirements and quality assurance of prospective students. Others have to do with factors

that the programmes themselves cannot easily change. These include the general popularity of Molecular Biology among young people and their knowledge about the subject, the labour market situation for Molecular Biologists, the general reputation and attractiveness of both countries and institutions among prospective students and national systems for student financing. Discussions during the project indicated that Molecular Biology appears less attractive for prospective Norwegian students than in the other countries, resulting in little competition among interested students in Norway.

Heterogeneous student populations are a challenge that the programmes increasingly face, and it is critical that the programmes find adequate ways of handling it. The discussions indicated that the mechanisms for dealing with this issue is primarily related to admission criteria and other means of assuring proper quality of their applicants, as well as offering introductory courses to bring all new students to the expected level. In addition, it is important to secure good support systems, especially for international students. The project showed that this area is not properly emphasised by most programmes.

Teachers as quality factors

Teacher competence refers to the ability to facilitate learning experiences of high quality and that the teachers should be active researchers. Enthusiastic and competent teachers are absolutely essential for developing effective learning methods and providing good teaching and learning experiences, but it is important that the responsibility is not left to the individual teacher. Systematic fostering of quality teaching needs to take place at both the institution-wide level (policy design, support from the leadership to the faculties, departments and programmes and internal quality assurance systems), the programme level (actions to measure and enhance the design, content and delivery of the programmes) and at the individual level (initiatives to help teachers achieve their mission, encouraging them to innovate and to adopt a learner-oriented focus).

The project concluded that programmes and institutions should make resources available for pedagogic development projects and establish arenas where their teachers can share and discuss practices, experiences and pedagogical research, and work in teams to assess and develop their quality of teaching. They should also implement clear requirements for emphasising pedagogical training, teaching experience and outcomes in hiring and promotion processes. Systems such as the “Excellent teacher” scheme in Sweden can clearly be an important mechanism for giving teaching a higher status and promote pedagogical and didactical research relevant for master education in Molecular Biology. However, if these mechanisms are designed for the excellent few, it is very important that they are supplemented by less formal and demanding systems for pedagogical development and peer-review in order to be accessible for all teachers. The project also found that buying out researchers from their teaching responsibilities seems to be a very short-sighted strategy. Teaching by top researchers is attractive for talented students, and good research groups renew themselves by attracting these students. If the top researchers do not teach, both the quality of teaching and research is likely to suffer in the long run.

Learning processes and assessment

Master research project(s)

The master research project(s) represents one of the most, if not the most, important learning process within the master programmes in Molecular Biology. The Norwegian programmes typically have one large project of 60 ECTS whereas the programmes from Sweden either have one or two projects with different numbers of ECTS (from 60-30). The programmes from the Netherlands have two smaller projects (30 ECTS), and the Flemish programme have one 30 ECTS project.

A critical quality factor for the master research project(s) is to introduce the students to real research questions and methods, and enable them to carry out independent research under supervision. Moreover, the students should know what it is like to work as a scientist in an active research environment. The programmes clearly expressed that although ideal, producing publishable results should not be considered a critical quality factor for master education. It is, however, critical that the students are given the possibility and incentives to have real ownership of their project, by writing their project proposal, taking some degree

of responsibility for project planning and management, experimental design and ensuring data quality. A minimum of approximately 30 EC is required in order to achieve these learning outcomes.

Assessment of master research projects

At all the participating programmes, the students present and defend their master research project(s) as part of the assessment. This is viewed as a critical quality factor, but it varies considerably as to how the assessment is organised and carried out, and what grading system is being used. It is also important that performance and attitude in the lab, as well as a range of transferrable skills not readily observed by assessing the written report, such as team working skills, independence, ability to come up with new ideas, ownership, responsibility and ethical awareness are effectively taken into account.

Programmes from different countries use completely different grading systems. This seems to go against the Bologna process and the general aim of harmonising educational systems between European countries in order to facilitate mobility of students and employees. Although diploma supplements go some way to address this problem, discussions indicated that it does pose a real challenge. For instance, the Dutch programmes clearly stated that they would have difficulties accepting applicants from the Swedish programmes (where only fail and pass/pass with distinction is given) to their PhD programmes.

Innovative teaching and learning formats

While student-active learning activities are increasingly being used, traditional teaching formats such as lectures still dominate. Student-active learning activities are limited by the fact that the development or implementation of alternative teaching and learning activities are time and resource limited. The programmes report that the main challenge of developing and implementing new teaching formats and learning activities is that they simply do not have time to fit this effort into their teaching practice to the extent they would like to.

Reflection and conclusions

In this paper, we present a methodology that combines elements from formative evaluation and benchmarking, which allows identifying subject specific critical factors for achieving high quality in study programmes. The project is the result of collaboration between students and faculty representatives from study programmes and QA agencies, and therefore promotes a shared understanding of quality among the different stakeholders. We believe the methodology constitutes a valuable supplement to traditional programme evaluations, because it provides a programme-driven platform for discussions and sharing of experiences, self-reflections, practices and ideas. The results include analyses of major differences between countries and programmes, discussions of strengths and weaknesses of different strategies, scopes and practices, as well as examples of good practices and relevant indicators for monitoring quality.

From a QA agency point of view it was interesting and reassuring to see that the faculty member and students from different countries and study programmes identified quality factors that to a large degree overlap with NOKUT's own views.

There were multiple strengths of the project. First, since the programmes themselves identified critical quality factors and reflected upon how the programmed faired in relation to these, we believe there was a high degree of "buy in" from the participating programmes. Second, because there was a large degree of overlap between the quality factors that the programmes identified, the discussions throughout the project gave the participants an opportunity to learn from each other and to share good practices on how to achieve better outcomes. Third and final, the project allowed faculty members within and across countries to come together and discuss teaching and learning in a way that is relatively rare in higher education. The faculty members are used to workshops, seminars, and conferences about research, but reported that they rarely have similar discussion regarding education, teaching and learning.

The project has two particular weakness that bare mentioning. First, since the programmes were uninterested in participating in a project assessing the actual quality of the programmes, we were not able to compare how well the programmes actually perform. This was a main goal of the Norwegian Ministry of Research and Education and the project failed in this regard. Second, there is no follow-up of the project. Even though we believe there was a significant "buy in" from the participating programmes we have no way of knowing whether the programmes actually use the advice they received in order to improve the quality of education.

To conclude, we believe the outcome of the project gives all stakeholders, including universities and programmes that did not participate, as well as quality assurance agencies and governing authorities, insights into how the programmes work to achieve high quality, and inspiration for quality development and improvement. We also believe the method we developed can be used by any institution or programme of higher education, also without the participation of any QA-agency. In other words, programmes that have an interest in learning from other programmes can apply the method in order to increase the quality of the education they offer.

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