

**QUALITY MANAGEMENT AND
ACCREDITATION
for study programmes in forest sciences
and related disciplines**

Proceedings of the SILVA Network Conference

Department of Land, Environment, Agriculture and Forestry
(TESAF)

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PREFACE I

The SILVA Network and the editors are delighted to present you the proceedings of the SILVA Network 2018 Annual Conference, organised together with the University of Padova, Department of Land, Environment, Agriculture and Forestry (TESAF) and the IUFRO Education Group. It was held in Villa Revedin Bolasco, an historical site belonging to the University of Padua in Castelfranco Veneto (Italy) from June 26, to June 28, 2018, and concluded by a fieldtrip on June 29, 2018 to the Rifugio Conseria in the Autonomous Province of Trento, during which relevant aspects of Italian forestry were presented.

A first overview about ‘quality assurance and curriculum development’ was given already within the SILVA conference in Valencia, Spain, in 2006, see SILVA Network Publications 4. Since that time the institutional landscape in higher education underwent many changes. The organisers saw this as reason to focus again on this subject. The results are laying in front of you. Seventeen universities or about one third of the members of the SILVA Network responded to this call, sending 29 representatives to the meeting.

Thirteen informative presentations, followed by stimulating discussions, were transformed by the authors into ten papers, included in this volume. We thank the authors for their creativity and endurance, the reviewers (Urs Brändle, Gerhard Müller-Starck, Mika Rekola and Martin Ziesak) for their critical and constructive comments. Finally, we are grateful to the local team of University of Padova for a splendid organisation in the nice conference building and its surrounding park, allowing the participants restorative walks, and for the tasting of Italian cheese during the fieldtrip on a mountain meadow.

The editors



Participants of the Annual Conference of the SILVA Network in Castello Franco near Padua (Italy), June 27th-June 29th, 2018

PREFACE II

The SILVA Network Annual Conference for 2018 took place from June 27 to June 29 in Villa Revedin Bolasco, an historical site belonging to the University of Padova. The topic was 'Quality management and accreditation for study programmes in forest sciences and related disciplines. Local organizer was the Department of Land, Environment, Agriculture and Forestry (TESAF) of the University of Padova.

The conference focused on the ambitious goal of improvement of learning and teaching by implementation of quality management structures and processes and by accreditation. The conference was opened by three representatives of the host university and the SILVA-Network:

- Prof Raffaele Cavalli, Head of Department TESAF hosting the conference, welcomed participants and introduced the location, Villa Revedin Bolasco;
- Prof. Dr. Paola Gatto, Director of MSc in Forest Science, welcomed participants on behalf of the host university forestry departments;
- Prof. Dr. M. Ziesak, Vice-President of SILVA Network, formally opened the conference.

Various topics were addressed at the conference, and a strong participation from the local and international forestry students' association (AUSF and IFSA) was present, with two presentations respectively on forestry students' opinions about teaching evaluation methods and the role of student associations in creating value, capacity and graduates ready for working life.

During the first afternoon, and the following morning presentations touched aspects of quality and accreditation from the perspective of different universities (Estonia, Finland, Germany, Italy, Lithuania, Switzerland, Sweden). Further topics touched on peer review of teaching, on the role of internationalization and gave example of different accreditation methods, with highlights on differences and similarities between countries. In the afternoon of the second day, activities started with greetings from ICA - Association for European Life Science Universities - representative (Simon Heath) and a presentation from a representative of IUFRO (Mika Rekola) of the joint IUFRO-IFSA task force on forest education.

Round tables were held in the afternoon, with topics ranging on three pivot points: bureaucracy, strengths and limitations of joint efforts for securing teaching quality and a draft communique on quality assurance and accreditation. A final discussion on the outcomes of the round tables concluded the second day.

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The SILVA Network annual conference is an important date in the agenda as a basis for exchange of ideas and to foster improvements by sharing experiences between countries. For this reason, the Department TESAF was honoured to host the 2018 SILVA Network conference.

Raffaele Cavalli
(Head of Department TESAF)

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SUMMARY

PIETER SCHMIDT

The main topic Quality Management and Accreditation was addressed in nine presentations during the meeting presenting and discussed on many levels, from university as a whole to a single course. One presentation was, which is not abnormal during this kind of meetings of the SILVA Network, dedicated to another subject fitting in the broad attention scope of this Network.

Introduction

In his keynote introduction to the conference, NORBERT WEBER (Department of Forest Sciences, Technische Universität Dresden) stated that as a result of joint efforts in the Higher Education Area (HEA), many universities and universities of applied sciences in Europe have developed and are increasingly implementing systems of quality management and accreditation. While the related terms are not used consistently, many efforts are recognizable on different organizational levels (courses, programmes, universities, countries, sub-national and supra-national levels). From the beginning on, SILVA Network has been involved in activities to establish and run quality management systems for courses and programmes in forest sciences and related disciplines. These systems need to include aims and targets of quality in teaching, the involved stakeholders inside and outside of universities, and the instruments for implementation. Accreditation, both as programme accreditation (of single courses or programmes) or system accreditation (for the whole university), is becoming a matter of course in many universities. Although there are still many challenges to achieve a “culture of quality” in all higher education institutions offering study programmes in forest sciences and related disciplines, there have been considerable advancements during recent years.

Quality assurance at university level

How quality in academic teaching can be improved is, according to ACHIM DOHRENBUSCH (Faculty of Forest Sciences and Forest Ecology, University of Göttingen) a complex and not uniformly answerable question. Key quality indicators related to academic teachers are listed. Governance options to improve teaching (a.o. number of students in relation to teaching capacity; quality of the incoming students) are presented as well as the objectives of appropriate quality management. Improved quality of studies may be reflected in a better identification of students with their programmes, but also in a reduced number of dropouts. The instruments of quality management in teaching, differentiated according to internal and external variants, are presented, highlighting strengths and weaknesses. Course evaluation, of course with consequences, graduate surveys and accreditation are discussed.

In their contribution, URS BRÄNDLE and FLORAN KNAUS (Swiss Federal Institute of Technology, ETH) provide an overview of the quality assurance measures for teaching at the ETH Zürich. In addition to centrally defined elements (basic teaching values, followed

by principles for curriculum development and criteria for good teaching), a number of other forms of evaluation next to the central evaluation managed by the Vice Chancellor have been developed in the various study programmes and their areas of specialisation. These differ in their formal anchoring, the regularity of their application and the actors involved. An overview is given. Using concrete examples from the Environmental Sciences programme, they explain how these forms of quality assurance can trigger immediate and long-term changes in the programme and where they see further potential for improving ETH's own quality management instruments. The latter includes the establishment of a framework for annual programme evaluation, the establishment of a feedback culture for the study programme and the facilitation of students' access to evaluation results.

At the Technische Universität München (TUM), Germany, programme accreditation has been replaced by system accreditation. Impacts are, as stated by GERHARD MÜLLER-STARCK, HANNA DÖLLING and MICHAEL SUDA, noticeable in forest science degree programmes. TUM's quality management system has been introduced as an administrative tool for university-wide evaluation and fine-tuning of the quality of education (teaching and learning). Its chief objective is to design, implement, and enhance degree programmes to be attractive, challenging and internationally competitive. Focusing on students and the quality of their academic training, this system covers all related academic processes, i.e. from the introduction of a programme to its continuing operation, evaluation, and optimisation.

The success of this quality management system, including four steps (plan, do, check, act), depends on the participation and commitment of everyone affiliated with TUM. Evaluation is conducted at three levels: course, curriculum and university. Feedback from employers is considered as important. In accordance with criteria established on an inter-university basis, quality management measures are implemented throughout schools, colleges and additional scientific and non-scientific TUM institutions. Quality management and accreditation should not be treated as an exclusive system inside universities. Flexibility is required in order to adapt degree programmes to the needs of future students, and to balance academic freedom and demands of the job market...

Accreditation is a common, in some cases even obligatory, process at European universities. According to ROLAND STÄHLI and MARTIN ZIESAK (Bern University of Applied Sciences, BFH), should accreditation not mainly become a burden, but a useful tool that contributes to improve teaching and learning. In their article some recent trends concerning accreditation processes are presented from a Swiss viewpoint. The recently finalised accreditation process consist of eight steps, the final one consisting of the publication of the results. Important parts of the process are a self-evaluation dossier, a site visit and the final report. BFH, for which institution the process is described in detail, is the first public university of applied sciences in Switzerland that received an accreditation on the institutional level. The main question addressed in the presentation tries to identify the possible impact from this accreditation success for the quality of study programmes. This is reflected from various perspectives and for future accreditation processes. Authors indicate that a system accreditation is a time and resource costing process, but positive effects exist also. Not only does it fulfil legal requirements, but the process may trigger helpful and important discussions on quality in any dimension. On a departmental level it may intensify visibility and interdepartmental cooperation. On individual level from teachers' view, the impact on

daily routine is quite limited, it has nearly no impact on individual reputation. However, achieved quality standards and streamlined processes are of benefit for all individuals, professors, students and administration...

Quality assurance at programme level

Evaluation of higher education can be done in many ways and from different perspectives. According to ERIC AGESTAM (Swedish Agricultural University), the Swedish government wants to have control over the quality of the higher education and the use of resources involved in it. Departments, course managers and teachers want to know how to improve individual courses and course elements. Therefore, approaches of evaluation differ greatly. Over time, in early 2000s, Swedish university authorities tried to use MSc theses to show how the education succeeded in achieving goals according to the curriculum. Since then, evaluation methods changed from control and developed towards being a support and tool for development. The most recent evaluation methods of education, including degree certificates, evaluations of educational programmes, reviews of the universities' own quality work and thematic evaluations, find higher acceptance by teachers and other staff since they have become more of a dialogue and all parts of the universities are evaluated. Amongst other methods, the persons in charge for the Euroforester programme, which is an international programme in forests and forestry offered at the SLU Campus in Alnarp, have conducted an alumni survey. The students are generally very satisfied. The results of the last survey (2017/18) are discussed in detail. This type of questionnaire gives the course management specific information that is much more useful than conclusions derived from the large national evaluations.

Quality assurance at course level

The role of competence orientation in curriculum design and quality assurance has been discussed many times at annual conferences of SILVA Network, especially at those in Valencia in 2006 and in Lleida in 2012. Competence orientation is, as stated by SIEGFRIED LEWARK (University of Freiburg) important on the level of the curriculum, but also on the levels of the study subjects and the single courses. This orientation should be a conscious aim of teachers and learners and should be formulated in the respective curricula and course descriptions.

Realisation of such considerations is exemplified with study courses from Forest Work Science, traditionally a study subject in the forest sciences programmes in Germany. LEWARK'S contribution focusses on courses held in the forest sciences study programme of 1995 at the University of Freiburg, which are used as examples of courses aimed at basic students' competences in ergonomics. The course objectives were (i) achievement of knowledge of work study methods, (ii) the ability to use them, and also (iii) affective orientation. The innovative study programme of 1995 as well as the three courses used as examples in this presentation are discussed intensively.

In this study programme, each course ended with assessments of learning results, mostly written. They functioned as ‘training’ for the final examination at the completion of the study programme.

Courses were evaluated by students using a mind map, adapted for each course. Results were processed straight away and discussed with the participants.

While quality assurance in higher education is often seen in connection with formal approaches, especially accreditation, the reasoning of this contribution as well as of the examples outlined is showing that much of the quality of the learning process is realised on the level of single courses.

Following the increasing demand for digital learning, the University of Padua (UP), in Italy, introduced its first e-learning course into forest science disciplines in 2006, jointly with other European universities through the Erasmus Mundus programmes SUTROFOR, SUFONAMA and MEDFOR. More recently, another course was added thanks to the ECOSTAR project which was funded by the Erasmus+ Knowledge Alliance programme of the European Commission. According to LAURA SECCO, MAURO MASIERO, ALESSANDRO LEONARDI, LUCIO BROTTTO, COLM O’DRISCOLL, DAVIDE PETTENELLA and PAOLA GATTO e-learning courses based on intensive online interaction with students are well consolidated in the Forest Sciences MSc programme offered by UP, while Massive Open Online Courses (MOOC) are being tested. A number of courses are presented in detail, which form the basis for evaluation. Several lessons can be learned from the experience so far. Among other things, the moderation and case studies brought from outside, i.e. from the business sector, highly contributed to increasing the interests of participants toward applications and job-orientation of the scientific contents. But, on the other hand, knowledge brought in by the students has positive effects on the collaborative learning dynamics. The most prominent lessons relate to the challenging issues around the administrative bottlenecks for the enrolment and management of external participants who are not formally enrolled in partner universities (i.e. students from other universities or non-academic practitioners). Fees are an issue here, too. Changes are needed to tackle these issues to increase the potential of e-learning. Such changes include making administrative rules more flexible and digitalized, providing enough resources to have an adequate ratio between e-students and educators and train the latter in communication techniques and technologies (e.g. video making, story-telling).

Results from a survey on forestry students’ opinions of the evaluation procedures adopted at University of Padova for forestry-related courses are presented by FRANCESCO PIROTTI, MARCO BOSCARO, MATTIA BALESTRA, TOMMASO ANFODILLO, STEFANO GRIGOLATO, EMANUELE LINGUA and PAOLA GATTO affiliated at that university. The poll was organized by the local forestry students’ association, (AUSF). The data allowed a better understanding of the students’ perspective regarding their engagement in quality assessment of single courses and how students perceive importance of course topics. Results show that students think that their feedback through the online and paper feedback forms is important. Even if their appreciation of the overall importance of the procedure is very high, the perceived importance of the single methods used (paper and online feedback form) does not vary much. Regarding the importance of course topics, the responses have a high variance, showing that opinions are not uniform. This can be interpreted as study programmes

providing a good mixture of topics, even if students do feel that some topics are more important than others and are not so much weighted in the course offer.

Internationalisation of higher education

The internationalisation of the higher education institutions is of increasing importance. According to SUSANNE KLÖHN (University of Padua), the University of Padua recognises this and stimulates teaching in English, joint and double degree programmes and participates in a large number of them. The result is that the number of mobility students increases with number of outgoing students exceeding those of the incoming ones. Moreover, these students obtain more ECTS credits and finish their study programme in shorter time, resulting higher employment chances.

Conclusion

In his concluding remarks, made in 2018 but written down one year and a half later, NORBERT WEBER stated that most universities offering education in forest sciences and related disciplines are applying evaluations, even though in different forms with regard to levels, actors, timespan and techniques. Moreover, it seems that the paradigm change from teaching to learning is not being represented in many lists of accreditation criteria. Striking is, too, that now, at the end of 2020, e-learning and distance learning, being a kind of experimental field for a smaller number of lecturers before Covid-19, are the dominating form how students meet their lecturers. Should more new forms of evaluating be developed?

QUALITY ASSURANCE IN AND ACCREDITATION OF STUDY PROGRAMMES IN FOREST SCIENCES AND RELATED DISCIPLINES: FRAMING THE ISSUE

NORBERT WEBER

Abstract

As a result of joint efforts in the European Higher Education Area (HEA), many universities and universities of applied sciences in Europe have developed and are increasingly implementing systems of quality management and accreditation. While the related terms are not used consistently, many efforts are recognizable on different organizational levels (courses, programmes, universities, countries, sub-national and supra-national levels). From the beginning on, SILVA Network has been involved in activities to establish and run quality management systems for courses and programmes in forest sciences and related disciplines. These systems need to include aims and targets of quality in teaching, the involved stakeholders inside and outside of universities, and the instruments for implementation. Accreditation, both as programme accreditation (of single courses or programmes) or system accreditation (for the whole university), is becoming a matter of course in many universities. Although there are still many challenges to achieve a “culture of quality” in all higher education institutions offering study programmes in forest sciences and related disciplines, there have been considerable advancements during recent years.

Keywords: Higher education, forest sciences, Europe, quality assurance, SILVA Network.

Introduction

Principles and rules for quality management have been developed firstly for private enterprises to secure that their products and services follow fixed quality standards and lead to high consumer satisfaction. Only in later stages, these thoughts have been transferred to the public services. Institutions of higher education were the last ones following these ideas systematically. Several reasons led to the flourishing of the idea of quality management as a new paradigm at universities: First, the introduction of the “New Public Management” at academic institutions; second, the implementation of the Bologna Principles for higher education in many countries in Europe and third, the embedding of university levels 6-8 (6-Bachelor, 7-Master, 8-PhD) in the negotiations on the European Qualification Framework (EQF, European Commission 2018). Today, quality assurance has become a mainstream issue, both in universities and universities of applied sciences. Hence, a quality assurance system is necessary for each university to secure and enhance the quality of education continuously and to assure employers, students, donors and the public that the institution has a good reputation, referring to experience of Cobb (2007).

In this specific context of quality management, several terms are often used synonymously, although there are slight differences in their meaning: Quality assurance (QA, the aim, often also used for the whole process); quality management in a narrower sense (QM, the

techniques how to achieve them), quality enhancement or improvement (especially if shortcomings have been identified), and quality control (focusing on the outcomes). What makes discussion on quality in teaching even more difficult is that the involved stakeholders (students, lecturers, professionals, politicians, “the public”) have different perceptions and expectations towards the term “quality” as such (Dohrenbusch, this volume). Quality management as a process depicts a combination of planning, steering, assessment and documentation. The latter includes accreditation, statistics, handbooks and benchmarking. Quality controlling as a procedural component should be considered as well (Thom and Meier, 2018).

Quality assurance and management have been a pivotal concern of SILVA Network from its beginning on, as it aimed at enabling an intensive exchange of experiences in high-quality teaching between universities from different countries and education systems all over Europe. More than ten years ago, the SILVA Network Annual Conference 2006 held in Valencia, Spain, was dedicated to the issue of "Quality Assurance and Curriculum Development in Forestry and Agriculture Related Sciences". The proceedings were published in 2007 (Schmidt *et al.*, 2007). In the meantime, many changes both at national level and at EU level have occurred (e.g. ENQA 2005; ENQA 2015; EHEA 2018) that made it necessary to revisit the issue. This resulted in a long list of questions to be addressed during the SILVA Network Annual Conference 2018 held in Castelfranco Veneto, Italy:

- Challenges for QA in higher education on different levels?
- Role of accreditation in improving teaching and learning?
- Monitoring, evaluating and accrediting international study programmes; joint and/or double master degrees?
- Relations between higher education in forest sciences and overarching quality assurance approaches, e.g. EQF?
- Differences between European and Non-European universities?
- Best practice quality assurance systems outside and inside universities?
- Contribution of graduate surveys?
- Roles of student representatives, alumni and employers in general?

Dimensions and procedures of quality assurance in teaching and learning

Quality assurance and management refer to many levels, aims, actors and instruments. QA is a multi-level issue. It comprises lectures, courses, programmes, universities, the national, European and international level (cf. the multi-level model of external quality assurance and accreditation displayed in van Damme (2004). On the lowest situational level it starts with the question how to improve single lectures and how to assess students' satisfaction. On the next level, the development of courses and programmes is in the centre of interest. Many efforts have been undertaken in curriculum development and numerous of these improvements have been boosted within international cooperation, e.g. within the TEMPUS programme of the European Union. The next level is related to quality assurance in universities where committees and procedures have been introduced to secure high standards of teaching and learning. Furthermore, initiatives on national level have to be mentioned that concentrate on accreditation of study programmes within a country (cf. the Quality Assurance and Accreditation System for study programmes in Italy as described in

Gatto *et al.*, 2018). All these national and subnational efforts are supported by initiatives on supranational (EU) and international level.

According to European standards of higher education, "[q]uality, whilst not easy to define, is mainly a result of the interaction between teachers, students and the institutional environment" while "[q]uality assurance should ensure a learning environment in which the content of the programmes, learning opportunities and facilities are fit for purpose" (ESG, 2015, p. 7). Another perspective highlights the 'signaling' value of QA for stakeholders from outside: "Assurance of quality in higher education is a process of establishing stakeholder confidence that provision (input, process and outcomes) fulfils expectations or measures up to threshold minimum requirements" (Harvey, 2004, p. 18; Stiglitz, 1973). QA is the means by which a higher education institution confirms that conditions are in place for their students to achieve the standards set by an accrediting or a QA body (QAA, 2004). Hence, QA activities should promote both accountability and enhancement (ENQA, 2015). They include internal (i.e. intra-institutional practices, for fitness of purpose) and external procedures (for securing consumer satisfaction). In this context, fitness for purpose "...links quality to the purposes and objectives of an institution or programme and brings quality assurance procedures to check and to improve the degree to which the actual operation of the institution of programme helps to realize those objectives." (van Damme, 2004, p. 131). The same author developed standards and indicators for quality assurance and accreditation in the CIPOF Model, including Context, Input, Process, Output and Feedback (van Damme, 2004, p. 155).

By issuing Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) in 2005), the European Union followed a proposal jointly prepared by the European Association for Quality Assurance in Higher Education (ENQA), the European Students' Association (ESU), the European Association of Institutions in Higher Education (EURASHE) and the European University Association (EUA). The revised version of the ESG 2015 involved even more actors, including Education International (EI), BUSINESSEUROPE and the European Quality Assurance Register for Higher Education (EQAR). It was designed as a "reference document for internal and external quality assurance systems in higher education" (ENQA, 2015, p. 6) and lists quality assurance agencies that have proven their substantial compliance with the ESG (<https://www.eqar.eu/register/agencies/>).

On each level mentioned above, the different aims and targets of QA have to be taken into account. These are often institutionalized by formal and informal rules as standards and guidelines. Several countries in Europe have introduced quality assurance and accreditation systems for academic education. Special importance has to be attributed to the aims of quality in teaching. For instance, TU Dresden adopted 12 aims in 2015. They are based on national criteria of accreditation and enhanced to the specific situation of the university. Issues covered are legal requirements (e.g. official documents, examinations), organizational issues (e.g. service units, mobility); diversity, transparency, cooperation, and special support for graduates entering the job market (TU Dresden, 2015).

Even more important than the establishment of a formal system is the development of a kind of "culture of quality" within the group of actors, including teachers, students and administration specialists. As this "internal quality culture" is not (or not yet) developed sufficiently in many higher education institutions (HEI), there is a formal supplement including external quality assurance, national accreditation and supra-national accreditation (van Damme 2004). In a broader sense, the actors of quality assurance are stakeholders inside of the university system (teachers and lecturers, students, administration staff) and outside (employers, donors, alumni, politicians, the public).

There are a lot of instruments available for quality management. Some of them are widely distributed, e.g. different forms of evaluation of teaching and learning quality (quality assessment of lectures by students, analysis of examination statistics, internal and external reporting, graduate surveys, accreditation etc.). While not yet applied everywhere, benchmarking, internal/external reporting and complaint management, including clear addressees and accountabilities, play a decisive role as well.

Accreditation

Accreditation of courses and study programmes is a special means of quality assurance that involves national accreditation councils and private or semi-national agencies. Theoretically, it is a construction of third parties (accreditation bodies) and fourth parties (organizations that register and control these bodies).

Accreditation is practiced on different levels, ranging from courses and programmes to universities. The rules are developed by national accreditation bodies that are implementing and modifying, at least in European Union countries, supra-national standards. The latter can occur in different forms: "real international systems of accreditation, meta-accreditation or recognition of existing national systems, regional integration of national systems via mutual recognition agreements or in the framework of free trade agreements etc." (van Damme, 2004, p. 143).

At university level, in principle there are two different types of accreditation. Programme accreditation aims at securing the quality of single study programmes by evaluation through external experts under the roof of specialized accreditation agencies and is directly oriented to the results of teaching and learning in the respective programmes and courses. System accreditation transfers responsibility to the universities themselves and is mainly process-oriented, e.g. aims at procedures where quality improvement becomes a standard for all programmes in the respective higher education units. The latter are developing binding rules and procedures for securing the quality of all the programmes offered at the university. During this process, they are supported by an external supervision committee.

System Accreditation at the example of Technische Universität Dresden, Germany

The accreditation process needs an involvement of several institutions on different levels of the university (programme level, faculty level, university level) and a clear distribution of

tasks. To give an example, at Technische Universität Dresden (TUD) this challenge has been solved as following (see Figure 1).

At the beginning, based on the assessment of students' and teachers' experiences and recommendations of external experts from the scientific and professional side, the university centre for quality analysis (ZQA) prepares a comprehensive report on the quality of each study programme. This report is sent to the respective faculty that has the possibility to write a response. Using both these documents, a specialized committee on quality in studies and teaching (KQSL) decides on the accreditation or non-accreditation of a programme. The accreditation decision regularly incorporates binding requirements and/or recommendations and is valid for a period of five years. It should be mentioned here that recently the Bachelor and Master study programmes of the Department of Forest Sciences of TU Dresden received accreditation.

A similar procedure is followed when a new study programme is to be established. Apart from this accreditation procedure, there are rules for operational quality assurance and complaints. Experiences since the introduction of the system in 2012 are promising. There is a high acceptance of the procedure from teachers and students. Against the background that provisions without sanctions often do not improve the situation, non-accreditation as the ultimate means can lead to inconvenient consequences for all groups of the affected programmes, ranging from students to staff. Graduates from a study programme that has not received or even lost accreditation might face disadvantages at the job market while the responsible staff is forced to demonstrate how the programme will be improved to regain accreditation.

Opportunities and challenges of QA systems

First of all, a decisive opportunity is that all QA systems are oriented towards improvement of learning and teaching. Besides, they improve comparability of higher education between different universities on national level and European level. They encourage student (and teacher) mobility e.g. by so-called mobility windows in the programmes where students do not face serious disadvantages when they conduct parts of their study programmes at other universities in their home countries or abroad. It should not be underestimated that QA is helpful to secure political and social acceptance of higher education activities. Finally, it can help adaptation to changing job markets.

- **Vice Rector for Academic and International Affairs**
Head of the Commission for the quality in teaching and learning
- **Commission for the quality in teaching and learning (KQSL)**
Operational body for accreditation of existing and new study programmes in the framework of system accreditation
- **Center for Quality Analysis (ZQA)**
Compilation of comprehensive evaluation reports for each study programme, based on statistical data from student surveys, instructors, alumni and additional recommendations of evaluations from scientific peers and employers
- **Programme coordinators (Studiengangskoordinatoren)**
Officially appointed lecturers and students, responsible for one or several study programmes; securing operational quality assurance and dealing with complaints; responding to the critique raised in evaluation report by ZQA
- **Working Group Q (AKQ)**
Development of the TU Dresden QM system for teaching and learning, including definition of quality aims and processes; chaired by the Vice Rector for University Development

Figure 1: Main institutions involved in quality assurance and accreditation at TU Dresden.

Still there are a lot of internal and external challenges. On the internal side, i.e. within the respective higher education institutions, QA needs a lot of communication and a clear decision on contact persons and responsibilities. This is especially important if system accreditation is to be established on university level, as this kind of accreditation needs the creation of new institutions (e.g. commissions for quality definition and / or assurance) and processes (e.g. complaint management). QA also necessitates acceptance by teaching staff, students and administration. Further education for teaching, learning and administration is a big issue, too. Effectiveness and efficiency of the system should not be neglected, as overburdened bureaucratic settings (as an end in itself) endanger the acceptance by all involved groups. However, as could be experienced at the example of TU Dresden, the establishment of about 10 full-time jobs for accomplishing the procedures around system accreditation did not only reduce the burden of faculty staff responsible for previous programme accreditations. It even promoted a kind of “culture of quality” where interest in good teaching and learning became a mainstream issue at the university.

External challenges are caused especially by permanent changes in political settings and the legal framework on different levels. Acceptance of the graduates’ qualification profile by employers is a further decisive factor. Especially since the Bologna principles have been accepted widely over Europe, international courses and programmes grew in importance. Typical difficulties to overcome in this regard are the different traditions, cultures and/or laws for teaching in the participating countries. A final challenge is given by closing gaps in research on quality assurance and quality management. Taking a closer look at

accreditation, it is also important to recruit suitable, voluntary scientific peers and professionals. These are necessary to support the universities by contributing unbiased recommendations for improvement of the respective systems and/or programmes.

Conclusions

While being introduced as novel instruments some decades ago, quality assurance, quality management and accreditation are at least formal elements of most of the universities all over Europe today. However, acceptance, commitment and further development of quality aims on different levels are crucial preconditions to make these efforts successful. Although there are still a lot of challenges ahead, the advantages of QA/QM are convincing. If quality management is conducted permanently and results in measurable improvements, a "culture of quality" can be established as a matter of course.

With regard to higher education in forestry and related sciences, for more than thirty years, the SILVA Network has contributed a lot to improving the quality of teaching and learning at universities and universities of applied sciences. First and foremost it enabled the exchange of experiences between countries/universities and the launching of cross-national cooperation. Today, internationalization in a broad sense is a dedicated policy of many universities in Europe to achieve improvements in quality (Klöhn, this volume).

Notwithstanding that many members of the SILVA Network have demonstrated an advanced awareness for quality in teaching and learning even before these issues reached the political agendas, the introduction of (and major changes in) quality standards of teaching on different levels sometimes are inconvenient and time consuming for developers and lecturers of forest study programmes. This becomes especially clear when we take a look at system accreditation where programmes in forestry and related sciences have to fulfil the same standards as other programmes of a university and deviations have to be justified thoroughly.

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QUALITY IN ACADEMIC TEACHING AND LEARNING – WISHES AND REALITY

ACHIM DOHRENBUSCH

Abstract

How quality in academic teaching can be improved is a complex and not uniformly answerable question. Key quality indicators related to academic teachers are listed, governance options to improve teaching are presented as well as the objectives of appropriate quality management. The instruments of quality management in teaching, differentiated according to internal and external variants, are presented, highlighting strengths and weaknesses.

Keywords: quality management, academic teaching, learning success, course evaluation

Introduction

The question „What is quality?“ seems to have a clear answer, but only at first glance. In fact, quality can be regarded and evaluated from very different perspectives. For example, when we look at a forest, its quality assessment can lead to very different results depending on the perspective: the manager of a sawmill will have a completely different view on the individual stand quality compared to a biologist who might be evaluating the quality and presence of attractive habitats for rare plants and animals.

Quality in academic teaching is not less complex. Depending on the groups of people involved you will get different assessments: For most students, teaching quality as an indicator for learning success is mainly linked to

- Structure and clarity of the presentation;
- Comprehensive explanations and illustrations;
- Rhetoric competence of the lecturer;
- Ability of the lecturer to motivate the students;
- Good time management;
- Convincing engagement of the lecturer.

In addition to these aspects the so-called „fairness“ of the lecturer has increased in importance for a good evaluation by the students. In this context „fairness“ for students does not mean the opposite of an unfair or incorrect treatment but rather a friendly and pleasant atmosphere in the communication between students and lecturers.

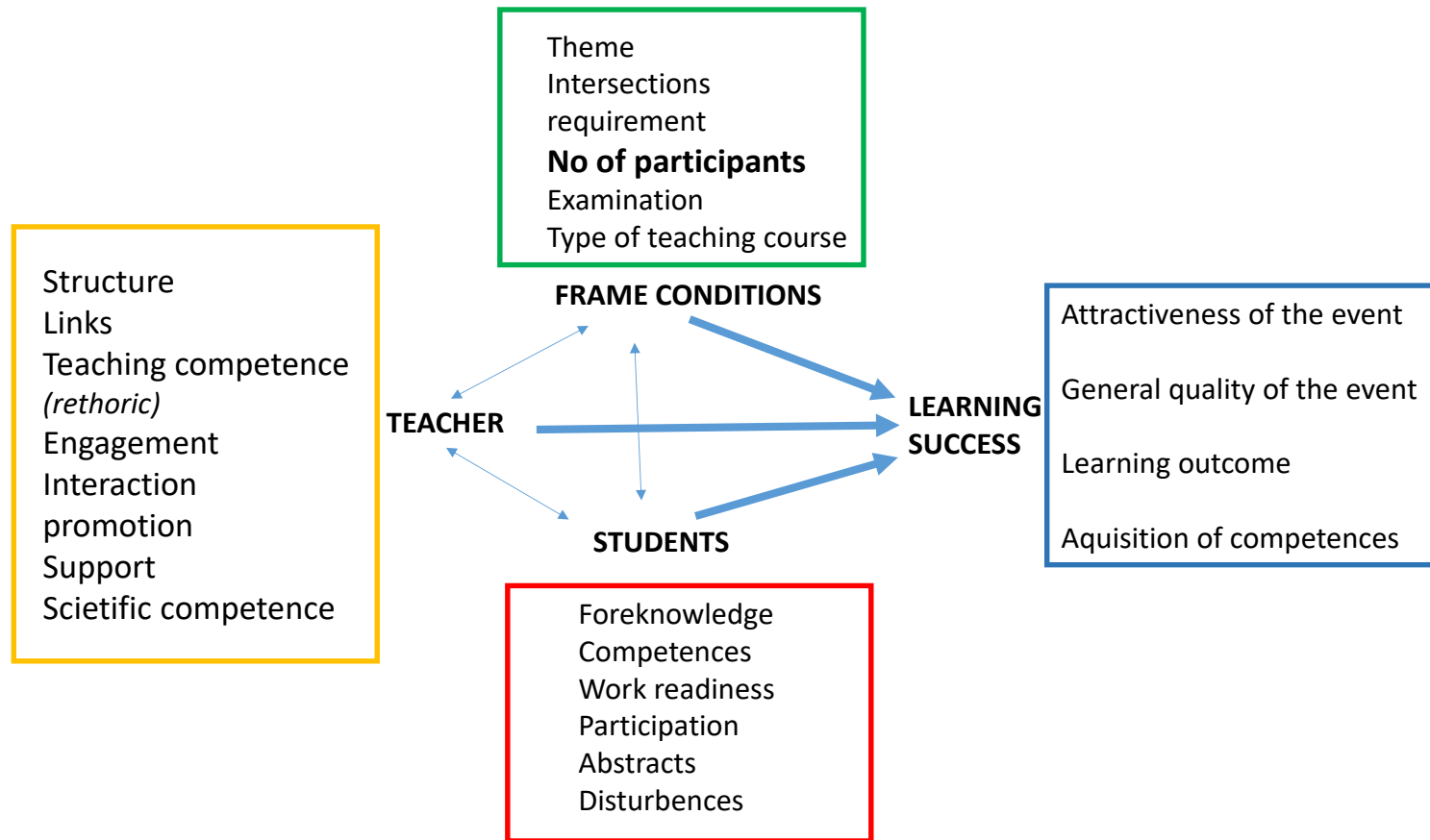


Figure 1: Conditions for successful learning, according to Rindermann and Oubaid (1999).

Rindermann and Oubaid (1999) explain learning success as the combined result of three main independent factors (see Figure 1):

- teacher's qualities in view of rhetoric, communication and scientific competences;
- The student's qualities in view of prior knowledge, competence, willingness to work and participation;
- In addition to 1 and 2 the general framework conditions are important. These are the topic of the course itself, the requirements for the course and the examination as well as the number of participants: small groups are better for a good learning success than large groups.

These three factor groups together influence the learning success which is defined as the learning outcome, the attractiveness and general quality of the teaching event and finally the acquisition of competences.

Steering options for improving quality

One of the important quality features is the number of students. The optimal number of students per study programme is very much dependent on the individual discipline. Social sciences, such as law or economics, are used to have large participant numbers in one semester because most of the teaching is comprised of lectures. Next to lectures, a forest study programme usually contains a number of exercises, seminars, excursions and lab courses with a relative high teacher-student ratio. This ratio is normally the control parameter for the holding capacity of a study programme. For the Faculty of Forest Sciences and Forest Ecology of the Göttingen University in Germany, the capacity for the Forest Bachelor programme was calculated to be 123 new forestry students per year in 2007. In 2017, due to political decisions (change of the accepted student-teacher ratio) in addition to an increased number of teaching staff, the holding capacity was raised to 169 new forestry students for the Bachelor programme per year. In reality, it is often difficult to fill up the study programmes with the optimal number of students. In 2007, the low interest of young people in academic forest education resulted in student numbers of only 50% of the capacity. Ten years later in 2017, the bachelor in forest sciences started with more than 200 new students per year for the intended 169 places (which is calculated on the basis of and decided by the teaching capacity). It is inevitable that this situation has a significant impact on the teaching quality.

Another aspect for the learning success, as a quality feature for academic teaching, can be seen in the educational background and competences of the students. Good education does not necessarily mean an academic degree from a university. However, there is an increasing trend in policy to bring more young people to the universities. In 1980 only 20% of the young people in Germany started an academic education at the university, today the number has risen to close to 60% (Statistisches Bundesamt, 2017) and this is comparably low when considering other European countries: The question must be allowed whether it is a good development to have an increasing portion of young people who are not qualified for an academic education at the universities, but enrol nevertheless. The fact that a large portion of the students does not finish their studies successfully is an alarming message.

Objectives of quality management.

Quality management in academic teaching has a number of objectives which have become increasingly important during recent years. There are some expectations associated with improving study quality: these include improving the attractiveness of courses in order to increase the motivation of students currently enrolled and also to get new students interested in the programmes. It is assumed that improved study quality is not only reflected in a better identification of students with their studies, but also that the number of dropouts can be reduced significantly (Wong *et.al.*, 2010).

In order to ensure good study quality, it is necessary to identify deficiencies in the study programmes and courses and, if necessary, to eliminate them. Universities have significantly improved the framework for ensuring and improving the quality of studies in recent years. First of all, this becomes evident in the creation of structures that guarantee a better quality of studies at various levels. At the University of Göttingen, the staff number has been increased significantly in recent years, both at the interdisciplinary central level and at the level of the individual faculties in the field of study and teaching. In the meantime, the central university administration does employ about 100 people, including staff for the study advisory service, study regulations, for e-learning and IT administration, and a quality management department, including areas like complaint management, idea management, diversity management and media and information management.

At faculty level, of course, the personnel structure of the study deanery which is responsible for all student affairs, is much smaller. For the Faculty of Forest Sciences and Forest Ecology with nearly 1,500 students, a total of 19 employees work in the Dean's Office, of whom 15 are involved in quality management in the broader sense. These include study advisors, staff members engaged in the examination office and coordinators for the different study programmes.

Instruments of quality management

The possibilities of implementing quality management in academic teaching are differentiated between internal and external instruments. The internal instruments include course evaluations, course talks, study surveys, complaint management, graduate studies, teaching reports of the faculty, and teaching and learning reports at university level. The external instrument is the accreditation by independent assessment organizations (McInnis, 2000).

Course evaluation

Course evaluation is one of the most important methods to maintain quality standards and improve them if necessary (Ramsden, 1991). More than 2,000 courses are evaluated by the students every semester at the University of Göttingen. The results are presented in tables and figures to the lecturers on the one hand and to the dean of studies on the other hand. In these surveys, students also have the opportunity to criticize the module by adding

handwritten comments to the evaluation sheets. According to the majority of the lecturers, these comments of the students are particularly useful to develop and improve the teaching.

Using the Faculty of Forest Sciences and Forest Ecology of Göttingen University as an example, the mid-term evaluation of the data shows that the average quality score has remained very constantly between 79% and 80% in recent years (reference: 100% would be perfect, if the course receives less than 50% the dean of studies must contact the teacher). Within the faculty, however, significant differences between the modules could be assessed. So, evaluations can be helpful in improving the performance of individual courses.

After almost 10 years of experience with teaching evaluation, some basic results can be summarized:

- Language courses have best quality evaluations;
- Courses with small groups have better evaluations;
- There is a correlation between learning success and general content;
- „Fairness“ of the teacher is important for good evaluations.

In particular, the last experience (the so-called fairness) must be regarded critically. If this criterion, principally standing for a friendly atmosphere in the classroom, is so highly evaluated, it is questionable, if this is actually a relevant quality criterion for the learning success. It must also be questioned whether a continuation of these surveys during each semester is justified, considering effort and benefit associated with them.

Consequences of course evaluation

Laborious regular evaluations can only make a difference if there are concrete options for improvement. If individual courses are repeatedly assessed badly by the students and the scores fall below a certain threshold, meetings of the dean of studies and lecturers are required. As a result, the poorly evaluated lecturer may possibly be asked to attend an appropriate training to improve his/her teaching skills. At Göttingen University, however, there are also far-reaching consequences for the departments. A proportion of the department's financial budget is based on the teaching quality parameters. The algorithm calculating the department's share does not only consider the number of lessons, the examinations carried out and the supervised qualification theses, but also the evaluation of the lectures. It is important for students to know that their evaluation of the courses has a real impact on the faculty's strategy.

Graduate study

The questioning of graduates conducted one to several years after completing their degree is primarily aimed at career opportunities of graduates. Since these are also related to the quality of the studies, such aspects are also queried indirectly in the same questionnaire. Study programmes with comparably few students, like forestry, benefit little from general student surveys at the level of the whole university, since the number of faculty graduates in the sub-sample is commonly small. Therefore, own surveys of faculty based graduate students have been carried out by the faculty in recent years, usually focusing on graduates

who have left the university one to three years ago. A further notably positive initiative was a joint graduate survey of all forestry faculties in Germany which was also published in a scientific journal (Liebal and Weber, 2016).

Accreditation

An accreditation is the only form of quality assurance that is usually done completely externally. At present, there are several accreditation agencies on the market that carry out the assessment of study programmes at universities. The German Accreditation Council has an overarching coordination and control function.

By March 2018, out of a total of 5,856 undergraduate programmes in Germany, 3,054 were accredited. That corresponds to a share of 52%. Of the total of 4922 Master programmes, 2971 were accredited, which counts for 60%. This accreditation process also has to deal with a continuously increasing criticism. Above all, this criticism is based on the high level of bureaucracy, the inefficiency and the high costs associated with such an accreditation. Many universities are undergoing a shift from so-called programme accreditation to system accreditation. This should strengthen the autonomy of universities and reduce costs.

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QUALITY MANAGEMENT AT SEVERAL LEVELS IN THE ENVIRONMENTAL SCIENCES PROGRAMME AT THE SWISS FEDERAL INSTITUTE OF TECHNOLOGY

URS BRÄNDLE AND FLORIAN KNAUS

Abstract

In this paper we provide an overview of the quality assurance measures for teaching at the ETH Zürich. In addition to centrally defined elements, a number of other forms of evaluation have been developed in the various study programmes and their areas of specialisation. These differ in their formal anchoring, the regularity of their application and the actors involved. Using concrete examples from the Environmental Sciences programme, we explain how these forms of quality assurance can trigger immediate and long-term changes in the programme and where we see further potential for improving our own quality management instruments.

Keywords: Curriculum management, course monitoring, graduate surveys, qualifications, environmental sciences.

Introduction

The Eidgenössische Technische Hochschule (ETH) is organised into 16 departments responsible for education, research and services in their respective science and technology domains. The departments are further subdivided into institutes (or laboratories), which are formed by thematically related professorships. In the Department of Environmental Systems Science (D-USYS), the institutes and their scientific staff bear the main responsibility for the implementation and development of subject-specific teaching, while the basic scientific and mathematical training is carried out by the corresponding departments. In addition, some of the applied courses are offered together with experts from outside the university.

ETH attaches great importance to quality management in teaching in order to promote and guarantee education at the same high international level as that of its research. In 2013, the Executive Board adopted an ETH teaching policy (ETH Zürich, 2019a) that defines basic teaching values. On that basis, principles for curriculum development and criteria for good teaching were defined. Teaching quality management controlled by the ETH Vice Chancellor (ETH Zürich, 2019b) consists of optional student midterm feedback, annually alternating student course/exam evaluations, graduate surveys and the teaching aspects of the departmental self-evaluations (Figure 1). The results of these are made available to the departments for critical analysis, evaluation and derivation of necessary measures. The departments report to the rector in SWOT style on their study programmes as part of the annual academic achievement (AAA) reports.

In addition to those central elements, departments are free to add further teaching quality assurance measures which are tailored to their specific needs. Here, we illustrate how

different forms of feedback and analysis are being used to monitor and improve the study programme on Environmental Sciences (EnvSci) and, in particular, we will look at examples from the Major in Forest and Landscape Management (FLM) (ETH D-USYS, 2019).

Forms of evaluation

The various elements of quality control in teaching at D-USYS are listed in Table 1. They differ in terms of the organisational unit responsible for the element, intervals at which they are performed, and their formality as illustrated in Figure 1. Elements which are applied more frequently tend to be informal and are primarily organised at the level of actual teaching or within the institutes, while the formal elements are the responsibility of the department or the university.

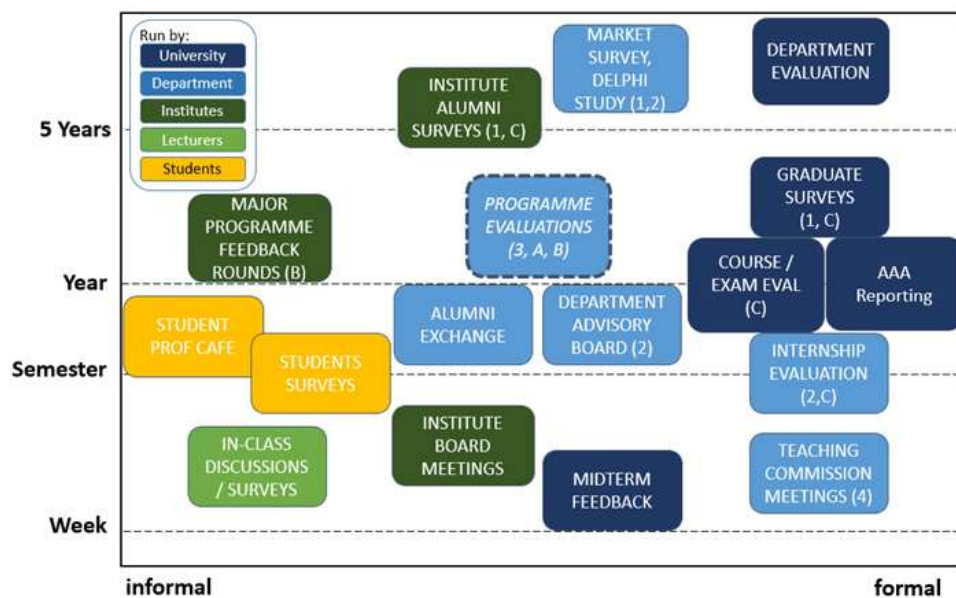


Figure 1: Elements of programme evaluations run by different academic groups and varying by granularity, timing, and programme level. See text and Table 1 for further explanations. Elements are labelled with numbers if discussed in chapter “Examples” and letters if discussed in chapter “Future Development”.

Table 1: Elements of Programme Quality Management at ETH D-USYS.

Responsible	Quality Management Element	Form and Function	Frequency
University	DEPARTMENTAL SELF-EVALUATION	Department compiles self evaluation report (w/ section on teaching) for visiting external reviews, final report to executive board	once every 6-7 years
	GRADUATE SURVEYS	Swiss Bureau Of Statistics conducts survey of all university graduates, 1 and 5 years after completion of studies; mainly on employability items, but with additional ETH questionnaire covering problem solving competences	every other year
	AAA-REPORTING	Annual Academic Achievement Reporting, teaching part contains SWOT like analysis	once a year
	COURSE&EXAM EVALUATION	standard questionnaires, annually alternating between lectures and course exams	yearly
Department	MARKET SURVEYS, DELPHI STUDY	Specific surveys conducted among stakeholders from policy and industry focussing on current issues and competences in demand by the job market, e.g. as part of programme revision	irregular, every 5-10 years
	PROGRAMME EVALUATIONS	For the moment consists mainly of monitoring course bookings, but will become a key element of evaluation by integrating information from all evaluation levels, including course booking data.	once a year
	ALUMNI EXCHANGE	Regular exchange with the alumni association (at programme level), focussing on recent alumni's views of needed skills and competences	once a year
	DEPARTMENT ADVISORY BOARD	consists of sixteen external partners from policy and industry and sixteen internal representatives from the six D-USYS institutes and the department leadership; teaching is represented by Study Directors	once per semester
	INTERNSHIP EVALUATION	Standardised questionnaire for students and companies after 4 month mandatory internship	Continuous, after internship
	TEACHING COMMISSION	Equal commission of scientific staff, students and professors; discusses all issues concerning study programmes, including quality (e.g. course/exam evaluations) and curricular development	twice per semester
Responsible	Quality Management Element	Form and Function	Frequency
Institutes (responsible)	INSTITUTE BOARD MEETINGS	Consisting of institutes professors, all issues concerning content and teaching resources of corresponding major programmes are agenda points	every month during semester

for Major programmes)	MAJOR PROGRAMME FEEDBACK ROUNDS	informal meetings where teachers, learners and coordinators of a major meet to exchange ideas and experiences of that particular programme	up to twice per semester
	INSTITUTE GRADUATE SURVEYS	Like ETH graduate survey but focussing on graduates of specific major programmes	every 3-5 years
Lecturers	CLASS DISCUSSIONS / SURVEYS	Many lecturers are in regular informal exchange with students; sometimes also based of formalized midterm-feedback (surveys) or as end of semester discussions in years with formal course evaluation	usually once per semester
Students	MIDTERM FEEDBACK	Formalized student feedback in week 5-7 of semester using classroom response system (ETH EduApp); initiated by students representatives who then also discuss results with lecturers	max. once per semester
	STUDENT-PROF CAFE	Informal meetings of first year students with professors, with special focus on freshman integration	once a year
	STUDENTS SURVEYS	Other forms of student driven evaluations, often intended to speed up curricular change	irregular

Examples

Graduate surveys monitor how well acquired competences meet professional needs and may trigger curricular adjustments at the programme, major and course levels

The Swiss Federal Statistical Office (BFS) conducts graduate surveys for all Swiss study programmes every two years. One section of the dataset provides the graduates' self-assessment of the levels achieved during the programme and the levels required by their employers for a variety of subject specific and non-specific competences from the programme's qualification profiles. In a recent study based on surveys from before and after the Bologna reform we found evidence that "most graduates general skills and subject related skills meet professional requirements better after the reform" (cf. Hansmann *et al.*, 2017, Table 1). The same analysis however showed reduced levels of achievement for competency in "environmental regulations" and – although still at very satisfying levels – for "interdisciplinary knowledge". The first challenge was readily corrected by re-focusing the law course on environmental aspects. The restoration of the level of interdisciplinarity is more difficult to achieve and requires multiple steps at the curriculum level, which we initiated on the occasion of our recent programme reform.

Since it is not possible to get major-specific data from BFS surveys, the Institute for Terrestrial Ecosystems, which runs the FLM major, conducts separate graduate surveys on institute level, which are published in the *Schweizerische Forstzeitschrift* (Ibrahim and Knaus, 2018). The results show that our graduates are still highly competitive in the targeted occupational field. A recent survey asking employers in the forest sector about the needed and acquired competences however suggests that some courses (e.g. in geoinformation science) should be made a mandatory part of the major curriculum in order to guarantee this competitiveness in the future (Gredig and Lieberherr, 2019).

Close interactions with the professional network outside the university provide valuable information for curricular planning and facilitates the application process for future interns

The EnvSci study programme underwent a fundamental revision in the years 2013-2015. In a Delphi study involving department representatives, members of the advisory board and other external representatives, we asked which competencies were necessary for future graduates to be effective in research, business and society. The results suggest that the university is expected to impart basic and advanced scientific competence, while the opinion prevails that management and leadership competence will be acquired mainly later in professional life (Figure 2).

A mandatory internship semester in companies or institutions outside the academic world is part of the MSc programme and provides first hand professional experiences. We routinely ask the companies at the end of those internships to indicate the skill levels of our students in different areas (Figure 3). The very positive results help future interns to gain additional confidence in finding suitable placements.

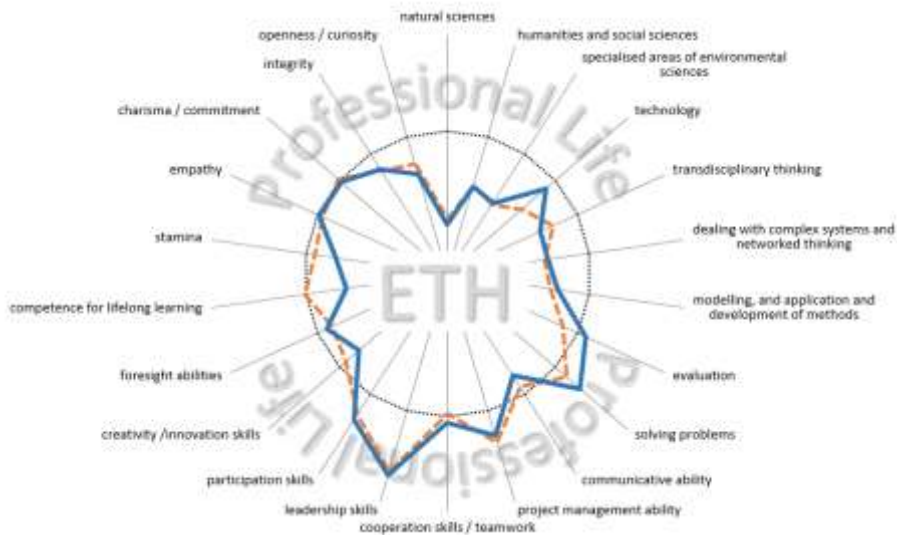


Figure 2: Where should environmental experts acquire competence –at ETH or in professional life? During a Delphi study conducted in 2013, 40 participants external and 39 internal to the department were asked to indicate for each competence to what extent it should be acquired at university (inside dotted line) or later during the course of a career (outside dotted line), respectively. (adapted from Pohl *et al.* 2014, p.17).

In addition, the internship surveys also provide very direct and short-term feedback from practice on changing methodological requirements (e.g. the increasing need for GIS competencies or Big Data analysis skills). This continues to have a considerable impact on curriculum planning. Since students often plan their elective courses on the basis of the experience they have gained during their internship, such changed requirements can also easily lead to an increase in the number of students in the corresponding courses.

Monitoring course bookings quickly points to shifts in students' preferences

While some effects of curricular changes can be foreseen, others are not easily predictable since they depend on several factors like fluctuating student interests and course schedule conflicts between electives and mandatory courses. For example, the 2013 revision of the FLM Major introduced larger course units (five instead of three ECTS credits). The students choose one of three available courses in each of four modules and can freely choose courses with a further 15 ECTS credits across the modules. The intended results were that the students would gain a deeper understanding of the subjects taught and that the profiles of the graduates would diverge less. Unintended side effects during the semester were a much higher workload (reported in the Teaching Commission) and a strong change in the distribution of core courses among the different modules (Figure 4). In order to identify such trends at an early stage and react if necessary, it is essential to constantly monitor course enrolment.

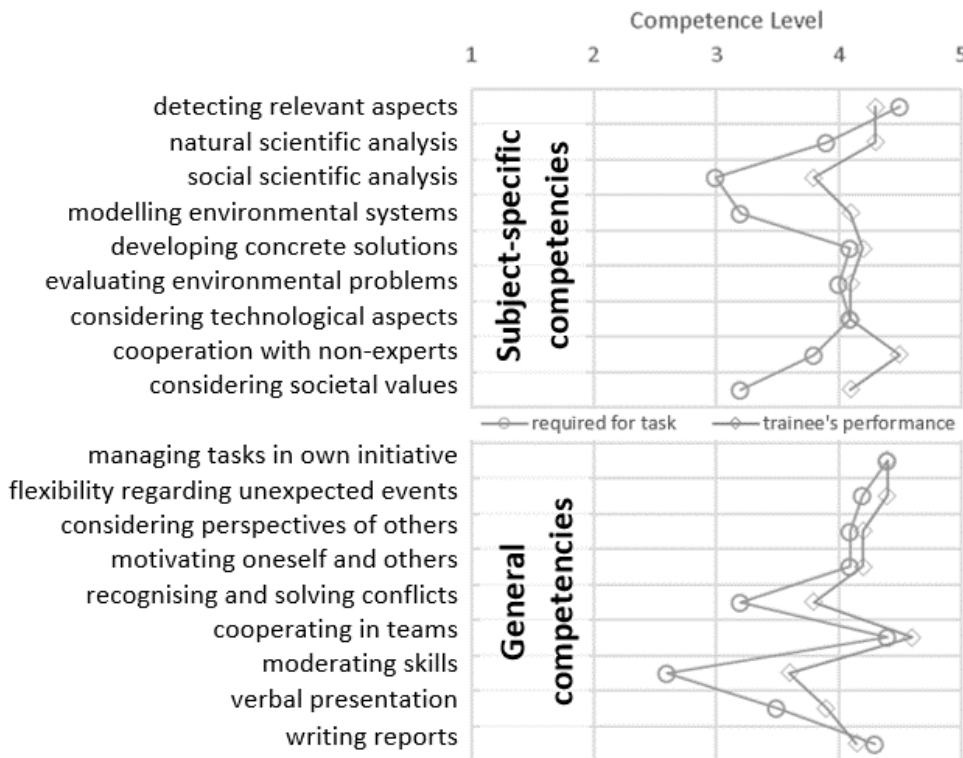


Figure 3: Internship Evaluations: Assessment of the Master students' subject-specific and general skills by supervisors of the work experience (N = 75, 1 = low level ... 5 = high level; 2010, adapted from (Steiner, 2010)).

The Teaching Commission provides short term monitoring of curriculum adjustments, sometimes even before implementation

The Teaching Commission discusses all requests for new courses and curriculum changes. It meets twice per semester and has a very active student's representation, such that most issues are reported and can be tackled within weeks of their appearance. For example, following a decision to increase the volume of the BSc-Thesis from 5 to 10 ECTS credits in 2011, students did more extensive experimental work leading to more data analysis in their thesis. Students almost immediately reported excessive workloads, and supervisors let the commission know that students did not have enough statistical skills. The Teaching Commission then initiated the design of an applied statistics course which started only a year after the curriculum change, a lot faster than the two year course evaluation cycle would have allowed for. This elective course was very successful from the beginning and is now part of the mandatory programme.

In our latest BSc curriculum revision, it was planned to cancel biosystematics excursions (including dendrology) in the first year in order to concentrate the resources of the institutes on specialized courses later in the programme. The participating students from all semesters were against it, because for them the excursions had played a decisive role in the choice of their major. They convinced the other members of the commission to maintain the topic in the new programme within the framework of the newly created biodiversity excursions.

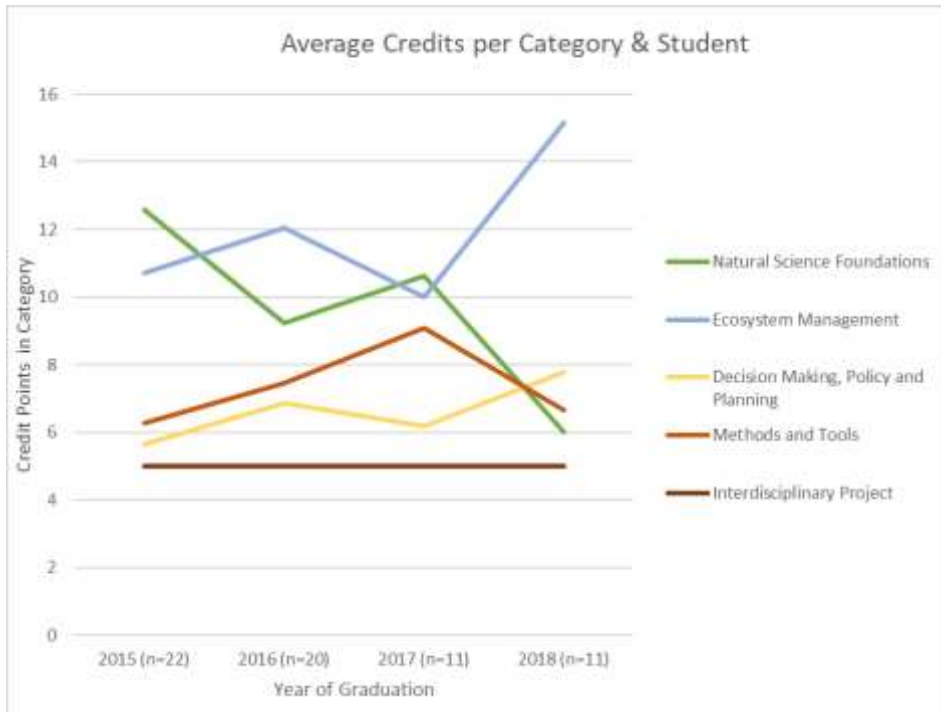


Figure 4: Students course preferences as indicated by credits scored in the years following the reform of the FLM curriculum. Students have to acquire at least five ECTS credits in each of the five categories and a total of 40 ECTS credits over all categories.

Future developments

The above examples illustrate that information from the programme and course levels over different time-scales, gained with different methods and from different actors, can be used to monitor intended and unintended effects of curricular changes and adjust curricular elements accordingly. With the Teaching Commission we have a core institution to make sure such adjustments are initiated. However, we see three major areas of potential improvements which ultimately lead to more efficient quality control:

- *Establishment of a framework for annual programme evaluation:* Although a lot of data is available on course quality, student's performance and their elective preferences, we yet have to implement a system that integrates this information annually and triggers potential adjustments to the curricula.
- *Establishment of a feedback culture for the study programme:* Much of the feedback on the overall programme comes from alumni, from individual discussions with students at major level or reaches the Teaching Commission by chance. In order to receive timely and regular feedback on the strengths and weaknesses of the study programme from a student perspective, we plan to conduct annual programme feedback rounds with as many students as possible towards the end of their studies. To this end, we are currently

testing rating conferences (Keller *et al.*, 2012), a combination of short questionnaires and group interviews.

- *Facilitation of students' access to evaluation results*: Students generally have online access to the results of course and examination evaluations. For their study planning, however, they need above all information about which qualifications are in demand in the coming career, and which courses and internship companies are considered particularly suitable for achieving the desired competencies. For students with a focus on forest sciences, the student organisation already offers such information in cooperation with the responsible institute. Our goal is to extend this best practice example to all other majors in the EnvSci programme.

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SYSTEM ACCREDITATION AND QUALITY MANAGEMENT AT THE TECHNISCHE UNIVERSITÄT MÜNCHEN

GERHARD MÜLLER-STARCK, HANNA DÖLLING AND MICHAEL SUDA

Abstract

At the Technische Universität München (TUM), Germany, Programme accreditation has been replaced by System accreditation. Impacts are noticeable in forest science degree programmes. TUM's quality management system has been introduced as an administrative tool for university-wide evaluation and fine-tuning of the quality of education (teaching and learning). Its chief objective is to design, implement, and enhance degree programmes to be attractive, challenging and internationally competitive. Focusing on students and the quality of their academic training, this system covers all related academic processes, i.e. from the introduction of a programme to its continuing operation, evaluation, and optimization.

The success of this quality management system depends on the participation and commitment of everyone affiliated with TUM. In accordance with criteria established on an inter-university basis, quality management measures are implemented throughout schools, colleges and additional scientific and non-scientific TUM institutions. Quality management and accreditation should not be treated as an exclusive system inside universities. Flexibility is required in order to adapt degree programmes to the needs of future students, and to balance academic freedom and demands of the job market.

Keywords: Forest science, accreditation, quality management, TUM, BSc, MSc.

Introduction

Until 2009, the study programme division forest science and resource management (Studienfakultät für Forstwissenschaft und Ressourcenmanagement) of the Technische Universität München (TUM) was subject of Programme accreditation. This type of accreditation was implemented by the ACQUIN Akkreditierungsagentur. It was initiated and financed by the Study Programme Division.

In 2014, TUM became subject of System accreditation following the regulations of the Swiss Centre of Accreditation and Quality Assurance in Higher Education. The decision is valid until September 30, 2020. It applies to all degree programmes that have passed TUM's internal quality management assessment procedures. Consequently, programme accreditation of the Study Programme Division Forest Science and Resource Management was replaced by system accreditation.

System accreditation

The TUM System accreditation procedure essentially consists of a self-evaluation followed by a series of external appraisals which are conducted by agencies certified by the Swiss Accreditation Council.

The benchmarks used in this procedure include the European Standards and Guidelines for Quality Assurance in Higher Education (ESG) and criteria specified by the Standing Conference of the Ministers of Education in Germany (Kultusministerkonferenz) and the Swiss Accreditation Council.

In Bavaria, all Bachelor's and Master's programmes are subject to accreditation (Article 10 Bayerisches Hochschulgesetz). By agreement with the Bavarian State Ministry of Sciences, Research and Arts, TUM formally committed itself to system accreditation in May 2005. Those central service units, which represent areas where teaching and learning intersect, are included in the accreditation procedure. For survey of the involved institutions and regulations see Figure 1.

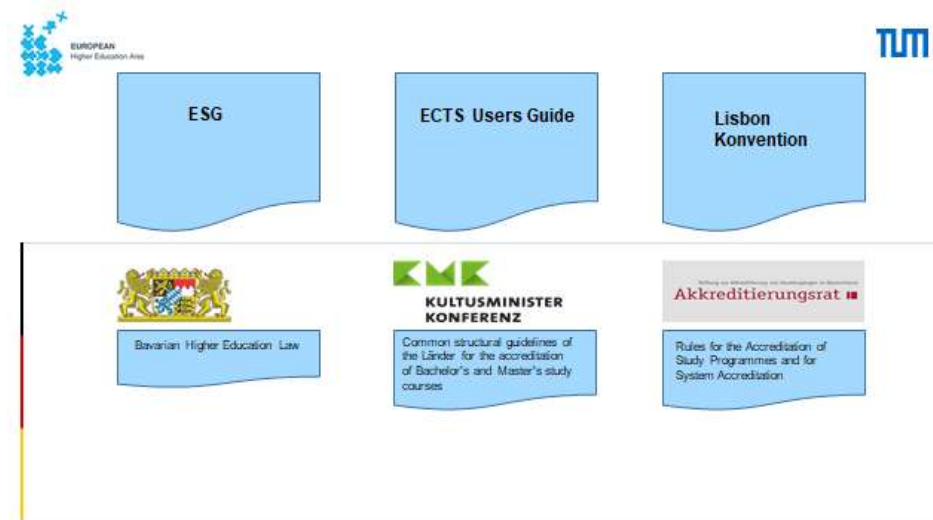
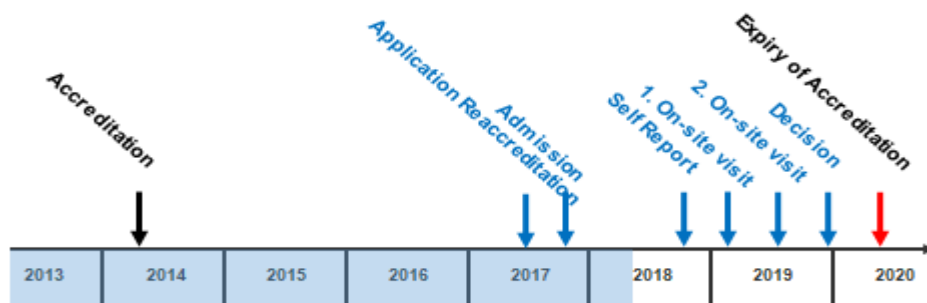


Figure 1: Frame conditions for accreditation. ESG= Standards and Guidelines for Quality Assurance in the European Higher Education Area (Anonymous, 2019).

The timetable for accreditation is illustrated in Figure 2. The accreditation procedure of TUM started in 2014 and was followed by an application for re-accreditation and corresponding admission in 2017. The A self-report followed 2018, and at least two on-site visits will complete the procedure before the next accreditation cycle will start.

TUM Timetable Accreditation



5

Figure 2: Timetable of the current TUM accreditation procedure and subsequent actions. (Anonymous, 2014; 2019).

Quality management

A significant element of the Bologna process, following the Bologna Declaration (1999), is quality assurance (Anonymous 2016). The initial version of “Standards and Guidelines for Quality Assurance in the European Higher Education Area” (ESG) originates from 2005. A revised version was adopted by the ministers responsible for higher education in Europe in 2015. In Germany, the Musterrechtsverordnung (Anonymous, 2017) defined corresponding ESG criteria. In order to fulfil these criteria, TUM established quality management (QM) in the following way:

TUM's quality management system is an administrative tool used university-wide to evaluate and fine-tune all factors affecting the quality of teaching and learning. Its chief objective is to design, implement, and enhance degree programmes that are attractive, challenging and internationally competitive. This system covers the entire degree programme life cycle and all related academic processes: introduction, operation, evaluation, and optimisation.

In order to establish a QM system, TUM engaged qualified staff, which is distributed all over the TUM faculties and collaborates with scientists and administrative employees at TUM. Consequently, QM is a coordinating point of scientists, lecturers and administration staff, that collects the different perspectives and leads the varied aspects to common solutions in terms of course development processes. The success of the QM system depends on the participation and commitment of everyone affiliated with TUM and the collaboration between the specific staff and the scientists and administrative employees at TUM. In accordance with criteria established on an inter-university basis, QM measures are implemented

throughout TUM's schools and colleges and additional scientific and non-scientific TUM institutions.

TUM views itself as an entrepreneurial university that serves as a responsible partner to industry and society. Consequently, QM initiatives are not limited to searching for optimal solutions within the frame-work of a state institution of higher education. Strategic goals are continually reviewed and refined. Active participation in the optimisation of the QM frame-work itself is of prime importance.

In case of study programmes, an overall QM cycle was defined which consists of a four step to-do list:

- Plan: Set quality objectives and identify potential targets for optimisation;
- Do: Select and implement appropriate optimisation measures;
- Check: Monitor the effects of these measures, draft follow-up recommendations;
- Act: Implement these recommendations.

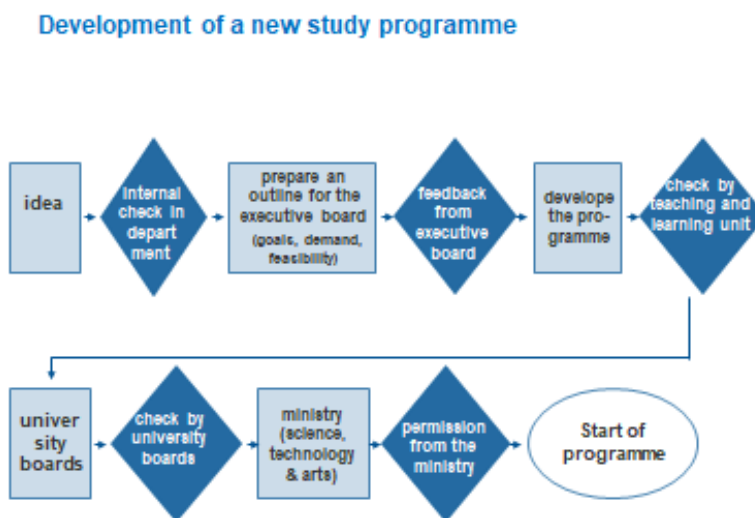


Figure 3: Pathway from the initiative to the start of a new study programme (Anonymous, 2019).

During the life cycle of any study programme, its operation is evaluated and re-evaluated in case of structural modifications. If it is intended to establish a new study programme, a dialogue with inner university boards and the responsible ministry is required. The workflow is depicted in Figure 3.

In general, study and teaching follows a complex organisational structure. In Figure 4, administrative workflows and responsibilities of faculties (schools) are surveyed. Conventional institutions such as the Ministry of Science, the TUM Supervisory Board, the Executive Board, the Senate, and the Faculties, still are decision-making bodies but in addition, new boards are involved: Extended University Steering Committee (EHP), Student's Service Centre (SSZ), University Unit Study and Teaching (HRSL), Managing Board Teaching and Parliament. For organisational details and definitions, and for QM with respect to academic and students affairs see Anonymous (2014, 2019).

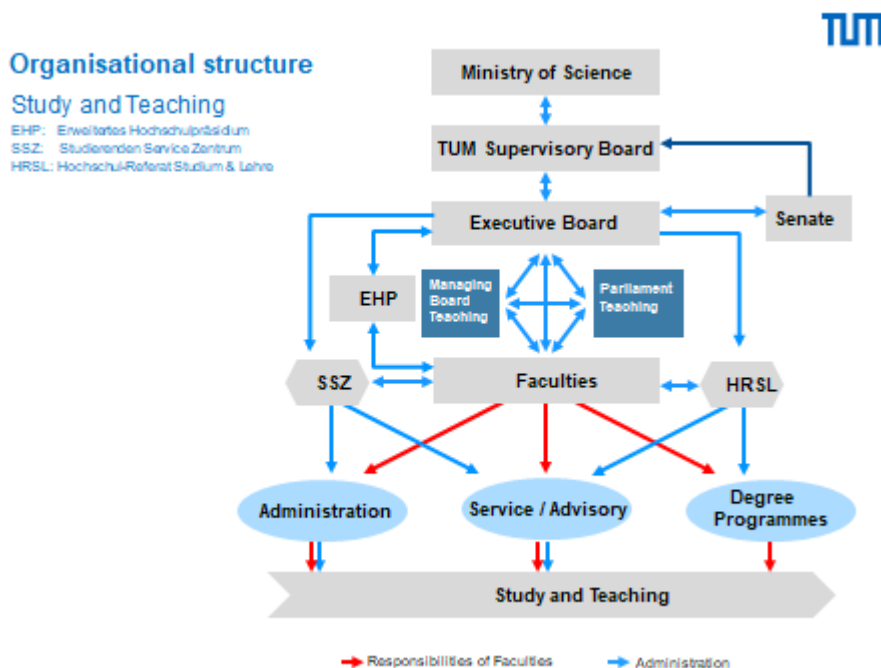


Figure 4: Survey of institutions and boards which are involved in any decisions concerning study and teaching at the TUM (Anonymous, 2019).

Study programme documentation, evaluation and feedback

In both, Bachelor and Master programmes, the modules are documented within the same framework. It includes basic information about the respective module level, the language, the duration and the occurrence; it embraces also numbering of credits, total hours, self-study hours, and contact hours per semester. In the description of achievement and assessment methods, type and duration of assessment, and the date for assessment retake are communicated. The description of content, intended learning outcomes and teaching methods is a major element of the module description. As an example, in Table 1 a module description is compiled which is part of the Master programme "Sustainable Resource Management".

Table 1: Description of the module “Genetic Resources Management and Forest Protection”

Genetic Resources Management and Forest Protection				
Module Level:	Master	Credits:	5 Credits	
Language:	English	Occurrence:	winter semester	Duration: one-semester
Total Hours:	150h	Contact Hours:	50h	Self-study Hours: 100h
Assessment Retake:	Next semester			
Description of Achievement and Assessment Methods				
The learning outcome will be assessed by a written exam (duration 60 min) where the students have to analyse the risk of given pest and abiotic hazard-scenarios and to develop adequate management strategies. Furthermore, they have to analyse a case study and interpret the genetic diversity situation presented there, including discussion of possible management strategies and problems. In this way, the students can demonstrate that they have obtained the ability to use their knowledge in real world management situations.				
(Recommended) Prerequisites				
None				
Intended Learning Outcomes				
On successful completion of the module, students are able to				
<ul style="list-style-type: none">- assess genetic diversity patterns in natural populations of different groups of organisms (mammals, birds, plants);- understand the importance of maximising genetic diversity;- understand the impact of biotic and abiotic factors on vitality and stability of individual trees and forests;- assess the impact of fungal pathogens and insects on tree health;- apply their ecological knowledge to minimise and forecast the risk of damages by fungal pathogens and insect pests;- characterise the impact of forest management on insect populations and crop loss.				
Content				
Part I: Genetic Resource Management				
1. introduction: DNA, genetic code, genes, alleles, genomes				
2. speciation, hybridization, phylogenies				
3. basics of population genetics				
4. genetic variation in forest ecosystems				
5. tree breeding, gene conservation & sampling strategies, certification of gene resources				
6. genetics of plants and animals in the mountains				
7. genetics of plants and animals in the tropics				
8. sustainable management strategies				
Part II: Forest Protection- pathogens, insect pests, climatic and abiotic factors.				
a) fungal pathogens in forest ecosystems				
1. fungal pathogens-woody plant interactions worldwide (incl. Phytophthora pathogens)				
2. techniques to identify fungal pathogens in forest ecosystems				
3. techniques to inhibit pathogen spread				
4. management strategies for nurseries and forest ecosystems				
b) insect pests in forest ecosystems				
1. insect morphology, anatomy and development				
2. insect biology				
3. herbivorous insects on trees				
4. economically important herbivorous insects				
5. pest control (monitoring and forecast)				
7. insect pest management				
c) abiotic hazards				
This part addresses risks of non-biotic damages (wind, water in different aggregation states, fire, pollutants, extreme climate conditions) and its interactions with pests and diseases as well as preventive management activities.				

Teaching and Learning Methods	
lectures and presentations, field trip (optional)	
Media:	
lectures and presentations (pdfs)	
Module Structure	
Course 1	Genetic Resource Management
Course 2	Biotic and Abiotic Forest Protection

Evaluation is conducted at three levels:

- Course level: Course evaluation by students using questionnaires (one per semester).
- Degree programme level: Online questionnaires for students and graduates.(every two years).
- School or department level: Peer reviews with self-evaluation and on-site visit (every four years).

These evaluations are documented by the QM circle of the respective school and department, respectively, and communicated to the Executive Board, the Managing Board Teaching, and the Parliament Teaching (see Figure 4).

In Figure 5, the feedback system of the TUM is illustrated. In addition to conventional feedback procedures, which are mainly based on students and graduates opinion polls, feedback from employers and experts is important for TUM. This feedback constellation is supplemented by statements of students changing their subjects and those who failed (“drop-outs”).

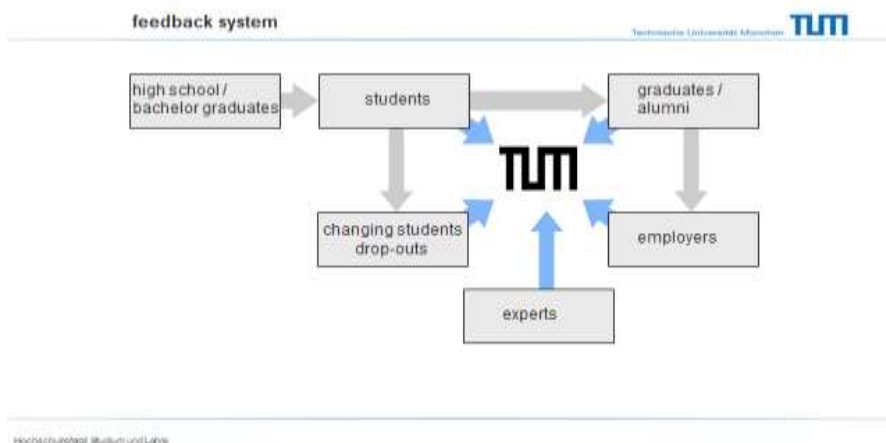


Figure 5: Illustration of feedback from students, drop-outs, employers and experts (Anonymous, 2019).

Feedback from employers and the job market in general is important for the Study Programme Division Forest Science and Resource Management because practice orientation is a significant element of degree programmes (e.g. Epema *et al.*, 2016; Müller-Starck and Weber, 2016; Weber and Müller-Starck, 2016). The improvement of students' mobility (Ziesak and Müller-Starck, 2014) and the resulting experiences are further components of a feedback system.

At the university level, a circle of experts is associated to the TUM, whose members represent major fields of economy, politics and science. Such external input is a significant additional element of the TUM quality assurance system.

Concluding remarks

The TUM System accreditation terminated the former programme accreditation of the Study Programme Division Forest Science and Resource Management, and thus restricted the scope of action in this field. Furthermore, the administrative complexity was increased considerably.

On the other hand, the financial burden was reduced for the Study Programme Division Forest Science and Resource Management, and manifold benefit was achieved as a consequence of the TUM quality management. This system is used university-wide. It covers all academic processes, i.e. from the introduction of a degree programme through its continuing operation, evaluation, and optimisation. It allows to evaluate and fine-tune the quality of teaching and learning particularly at the level of courses and of degree programmes. Thus, it stimulates degree programmes to be attractive, challenging and internationally competitive.

Feedback is an essential component of the quality management. It is based on students' and graduates' opinion polls, but also on the responses of employers and experts in those fields which are relevant for the respective degree programme.

It seems necessary that accreditation and quality management should not be handled as exclusive systems inside universities. Flexibility is required in order to adapt degree programmes to the needs of future students, and correspondingly, to the dynamics of the job market. Balancing academic freedom and demands of the job market is considered as a continuous challenge.

Acknowledgements

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OPPORTUNITIES AND LIMITATIONS OF ACCREDITATION PROCESSES AS PART OF QUALITY ASSURANCE - EXPERIENCES AND CONSEQUENCES FROM HAFL - BFH, SWITZERLAND

ROLAND STÄHLI AND MARTIN ZIESAK

Abstract

Accreditation is a common, in some cases even obligatory, process at European universities. In this context, accreditation should not mainly become a burden, but a useful tool that contributes to improve teaching and learning. In this article some recent trends concerning accreditation processes are presented from a Swiss viewpoint. With the recently finalised accreditation process, Berner Fachhochschule (BFH) is the first public university of applied sciences in Switzerland which received an accreditation on the institutional level. The main question addressed in the presentation tries to identify what impact may be achieved from this accreditation success for the quality of study programmes. This is reflected from various perspectives and for future accreditation processes.

Keywords: Accreditation, quality management, forestry.

Introduction

Quality assurance is an important instrument for the successful advancement of universities. Anyone who is prepared to critically review his own quality in an ongoing process recognises the strengths needed to be maintained, but also the stumbling blocks needed to be overcome. Quality development can take place in very different ways. Many different systems and procedures are proposed in literature, which differ, among other things, in whether the analysis and generation of measures is based on self-assessment or on external assessment. It is generally agreed that quality is a multidimensional construct (e.g. Matul and Scharitzer, 2002, p. 609) and that every university must ultimately define and operationalise individually what it understands by quality. However, external framework conditions and requirements must be taken into account, such as those resulting from formalised processes, public research funding or the standards defined in the course of the Bologna process for BSc and MSc programmes.

Most of the guidelines for quality assurance at Swiss universities are formulated openly. One of the essential requirements is the mandatory implementation of accreditation processes. The present text provides an insight on the procedure for the accreditation at higher education institutions in Switzerland and addresses the question, what contribution this process provides for goal-oriented, efficient quality development.

HAFL: A department of the Bern University of Applied Sciences

Berner Fachhochschule (BFH) [Bern University of Applied Sciences] is structured in eight separate, thematically grouped departments, one of which is Hochschule für Agrar-, Forst- und Lebensmittelwissenschaften (HAFL) [School of Agricultural, Forest and Food Sciences], located in Zollikofen near Berne. Within this department forest science is one of three major thematic fields of the HAFL life sciences. Some more details including recent figures were presented recently (Ziesak *et al.* 2018).

During its young history of forest science, established in 2003, the question of accreditation was always important. In a first approach and typical for that time an individual, study programme-oriented accreditation process was undertaken and finalized resulting in a certificate (see Figure 1). This accreditation was valid from 2008 till 2015. It then became evident that an institutional accreditation will be triggered on the BFH level, replacing the need to have the labour intensive process repeated at forest science level.



Figure 1: Programme accreditation for BSc in forest science as from back in 2008.

Accreditation processes at universities in general

The system for the accreditation of higher education institutions in Switzerland is based on the idea that all cantonal universities, universities of applied sciences and colleges of education as well as other institutions of higher education recognised under existing law, must be subject to regular examination as part of a formalised process. The so-called "institutional accreditation" is a prerequisite for the use of the term higher education institution, university or teacher training college and it is also a condition for public universities to be eligible for financial contributions (Art. 29 Hochschulförderungs- und koordinationsgesetz, HFKG). The accreditation processes in Switzerland are intended to ensure that "the universities have their own quality assurance systems and that quality assurance takes place effectively in accordance with national criteria and international standards. In addition, institutional accreditation should provide higher education institutions with greater national and international visibility, serve as a guide and decision-making aid, and help to improve the international recognition of degrees" (Schweizer Akkreditierungsrat, n.d.).

Accreditation at higher education institutions in Switzerland is based on a procedure that consists in the following steps:

- Reasoned application by the higher education institution to open the procedure.
- Admission decision, i.e. admission to the procedure by the authority, if all prerequisites are fulfilled;
- The Accreditation Agency will start the examination work;
- Assessment of the higher education institution by an external expert group;
- Application by the agency to the state authority, which has three options in their decision: Accreditation without conditions if all the conditions are fulfilled, accreditation with conditions if there exists a need of improvement or refusal of accreditation if important elements are missing;
- Publication of the accreditation decision;
- Where appropriate, verification of compliance with conditions.

For participating universities, three activities must be carried out within the assessment of the institution, which is step four) in the framework above:

1. A self-evaluation dossier must be prepared, which should be oriented towards the specified criteria.

It is assumed that the self-evaluation report is self-reflective and self-critical. The documents are expected to contain information, descriptions and analyses on which an assessment can be made of the degree to which the quality standards have been met. The information to be provided includes material on the following points (AAQ, 2015):

- Portrait of the university (special features, organisation, key figures);
- Description and procedure of the self-evaluation process;
- Reports or results from previous quality assurance procedures, where appropriate;
- Presentation of the quality system;
- Assessment of quality standards with regard to compliance;

- For each quality standard or standard area, a description of strengths, weaknesses and opportunities for development;
- Action plan for the further development of the quality system.

2. Based on the self-evaluation dossier, an on-site visit will be organised during which the expert group will hold discussions with various actors from the university in order to deepen the information from this report.

The composition of the peer review group must be balanced. To this end, the agency considers the gender, background and age of the reviewers as well as the special features of the university and, if applicable, its special teaching methods. It seems obvious that the reviewers must be independent in order to guarantee an impartial assessment.

Within the framework of their work, the external reviewers examine the university's entire quality assurance system based on specified quality standards. The concepts and mechanisms of quality assurance and quality development are analysed. In addition to the individual elements, it is also examined whether the various elements form a complete and coherent whole which enables the higher education institution to guarantee the quality and continuous improvement of its activities according to their type and specific characteristics. The proportionality between the resources used and the results obtained is also considered (AAQ, 2015).

The quality standards used cover the following areas of quality

- Quality system (strategy & assurance system);
- Governance;
- Teaching, research, services;
- Resources;
- Internal & external communication.

3. The report, which is written after the on-site visit, can be commented upon by the university management before the documents are sent to the accreditation agency.

For the entire accreditation procedure, a duration of 18 to 24 months is to be expected as a rule. All universities are requested to renew the accreditation every seven years.

Accreditation at the Bern University of Applied Sciences

The Bern University of Applied Sciences (BFH) was one of the first universities in Switzerland to decide to implement the new accreditation process as outlined above. The management committees of the BFH hoped that the rapid implementation of the new requirements would provide impetus for the ongoing strategic planning processes.

BFH began the accreditation process in late summer 2015. Synergies with the parallel strategy process could thus be optimally used. BFH submitted the self-evaluation report in mid-December 2016. In April 2017 the on-site visit by the external experts of the Swiss Agency for Accreditation and Quality Assurance (AAQ) took place. BFH was able to comment the expert report at the beginning of July 2017. Subsequently, AAQ submitted an application for accreditation of BFH to the Swiss Accreditation Council, which approved it in September 2017.

The results of the accreditation can be summarised as follows: the international, external expert group appointed by the Swiss Agency for Accreditation and Quality (AAQ) acknowledged BFH a good report and emphasised "the overall extremely positive enhancements of BFH in the past ten years". It certifies that the BFH "has a quality assurance system that covers all areas of the university". With two conditions, the AAQ points out the development potential that the BFH should exploit within the next two years. However, this is no longer part of the project, but will take place during ongoing operations.

In detail, the evaluators recognise the overall positive development of the BFH. It is stated that BFH presents itself with a clear profile. The expert group was impressed by the cohesion of the various groups of people among themselves, who, as students, teachers, researchers or service providers, as external observers or recipients of services, etc., represent different demands against the BFH. Management appears to be based on well-documented concepts and encompasses the various service areas of BFH. Among the strengths of BFH is the potential it can draw from its diversity.

In addition to the regular basic training, certain training areas are regarded as specially accentuated or specialised. Certain degree programmes are unique among Swiss universities of applied sciences in their fields. The evaluators found satisfied students and user-oriented services at the BFH. Interesting co-operations have emerged in various fields of research and services.

Besides these strengths, BFH is confronted with some challenges. The historical fragmentation into several locations remains an obstacle for efficient use of resources until the planned campuses are established. It is precisely here where BFH will be able to further improve the sustainability of its operations. In research and teaching, the topics and different perspectives related to sustainability seem to have been given not enough consideration. The interdisciplinarity, as made possible by the diversity of BFH, is consciously promoted in various areas, namely in research funding, but does not yet appear to have been optimally implemented.

According to the expert group's assessment, international networking is in place, but could be aligned even more closely with the BFH strategy. There are also challenges for the BFH regarding the quality assurance system. Participation in quality development must be increased in the future. The sequence of top-down and bottom-up structures in quality assurance does not always reach the addressees. It has been proven that the quality assurance of degree programmes is in a state of flux. As a result, it still seems somewhat not sufficiently structured at the moment. It is precisely here where the potential offered by the different approaches of the individual departments in quality assurance can be seen.



Figure 2: Accreditation certificate for BFH, as issued by AAQ in 2017.

A review of the accreditation process from different perspectives

A review of the completed accreditation process can be analysed from different perspectives. In the following sections we distinguish between the view of the entire university (BFH), the view of the department and its study programmes, in particular Forest Science, as well as the view of the individual lecturers.

In the perspective of the Berne University of Applied Sciences, the accreditation process can be regarded as successful. The various stages were completed quickly, many actors were involved, and a positive result was achieved. The university is thus accredited for the next seven years, albeit with conditions. However, it should be kept in mind that no university in

Switzerland has as yet been recognised without conditions. Accordingly, these additional conditions are a widely accepted instrument which allows the decisive authority to influence the further development of higher education institutions to a certain extent.

In retrospect, the effort required for the entire accreditation process must not be ignored. In addition to the involved process coordinators, more than 100 persons from the university were included in various actions such as data acquisition, report preparation or the on-site visit. The total workload amounts to more than 5000 working hours, an investment not to be underestimated, which can be evaluated positively in the present case. In addition to the workload, there is the coordination effort to be managed and the associated time pressure. For an accreditation process to be successful, it must be organized consistently and efficiently.

From the point of view of individual departments, it can be said that the entire accreditation process was realised at the university level. As a result, the departments had little to do with the process. At the same time, the commitment of the departments seemed to suffer somewhat. The tasks were delegated to the "headquarters" and thus also "handed on higher level" there. Fortunately, the departments can now benefit from the positive outcome of the accreditation. Changes in the courses offered by individual departments does no longer need to be approved by state bodies but can be decided by the – accredited – university management. On the other hand, the system accreditation replaces a former programme accreditation (see Figure 1), thus relieving the department, respectively the forestry group, from all the corresponding laborious and resource binding process actions. Therefore, this shift from departmental to university level may be noted positively as an act resulting in a reduction of overhead processes for the department.

From the point of view of the persons involved in the accreditation process, three subjective impressions were reported. On the one hand, many had the impression that the time during the interviews had been very tight. In addition, the questions asked seemed very diverse and, in some cases, poorly coordinated. On the other hand, it could only be partly understood how the experts had arrived at their derived recommendations.

In the short term, the accreditation process seems to have had little influence on the daily work routine of the lecturers. However, there are positive effects. During the process, cooperation between the departments was promoted. In addition, a constructive dialogue on quality aspects was generally initiated. It can be assumed that processes in teaching and research will also be optimized at individual level.

Conclusion

While it is clear, that a system accreditation itself is a time and resource costing process, there is an expectation to gain positive effects and not only to fulfil a legally binding procedure. The regarded institutional accreditation is dominantly providing consequences on this institutional level. As such it may trigger helpful and important discussions on quality in any dimension. On a departmental level it may intensify visibility and interdepartmental cooperation. However, on individual level from teachers' view, the impact on daily routine

is quite limited, it has nearly no impact on individual reputation. However, achieved quality standards and smooth processes are of benefit for all individuals, professors, students and administration.

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EVALUATION OF HIGHER EDUCATION - EXAMPLES FROM SWEDEN AND THE EUROFORESTER MASTER PROGRAMME

ERIC AGESESTAM

Abstract

Evaluation of higher education can be done in many ways and from different perspectives. The Swedish government wants control over the quality and use of resources. Departments, course managers and teachers want to know how to improve individual courses and elements. Therefore, approaches of evaluation differ greatly. Over time, in early 2000s, Swedish university authorities tried to use MSc theses to show how the education succeeded in achieving goals according to the curriculum. The most recent evaluation methods of education find higher acceptance by teachers and other faculty staff since they have become more of a dialogue and all parts of the universities are evaluated. The persons in charge for the Euroforester programme, which is an international programme in forests and forestry offered at the SLU Campus in Alnarp, have conducted a survey for alumni. The students are generally very satisfied. This type of questionnaire gives the course management specific information that is much more useful than conclusions derived from the large national evaluations.

Keywords: Higher education, evaluation, teaching, alumni, Euroforester

Introduction

Euroforester is an international MSc programme in forestry at the Southern Swedish Forest Research Center (SSFRC), Faculty of Forest Sciences, Swedish University of Agricultural Sciences, (SLU), Sweden. The focus is on forest and forestry including ecology in Northern and Central Europe. The education is specifically targeted at international students and all teaching activities are in English. The programme started in 2001 and has since developed in cooperation with many forest faculties in Northern Europe. The majority of students are international students. Since 2001 more than 760 students from 43 countries from six continents have participated in one or more of the courses. Many students take four courses during two semesters and then return to their home-country and credit the points in their national exam. So far 74 students wrote a MSc thesis at SLU and applied for a SLU diploma (Brunet *et al.*, 2018).

Evaluation of university education is very common, so also in Sweden, e.g. by ENQA (2017). Evaluations are performed at different levels and with different methods. The Swedish state wants an overview of university education and also control. how universities and faculties use public funding. The universities want to know, how faculties and departments work with programmes and courses. The directors of studies and teachers at departments and study programmes want to know, which courses or parts are successful or which ones need to be developed. Current and future students want to know more about the

quality of different courses and course-packages and, preferably, students and employers want to make sure that education provides competence useful in relevant areas.

Evaluating the quality of the programmes can be done in many different ways. It mainly depends on the perspective used but also general trends in pedagogy and state policy. In Sweden the methods for evaluation used by the state have varied during recent decades (Wahlen, 2012). One method has been to evaluate, how the aim of the programme was met, another to evaluate, how the education is implemented and a third one addressing the quality of the teaching and education. At the faculty and department level it is common to use students' course evaluations. Students and graduates are often involved in such evaluations of individual courses and programmes.

Evaluation of study-programmes

In Sweden, higher education and university programmes are evaluated by UKÄ, the Swedish higher education authority, previously Swedish National Agency for Higher Education (HSV). There is a long tradition of evaluations of UKÄ and HSV (Wahlen, 2012).

The Swedish evaluations of higher education have during the last decade changed from control and developed towards being a support and tool for development. There is a desire that the evaluations should help the universities to improve their educational structures and processes and evaluations have been seen as a journey and an educational aid. For a time, a very important part of the evaluations was the university's own quality development work, i.e. how the universities themselves work with quality issues. In Sweden, the evaluations are carried out by experts groups consisting of professionals mainly from the university staff, students and representatives from the respective sectors of the labour market.

Beginning in 2000, interest increased also in evaluating the results of the education. Degree projects (MSc theses) were then given a very important role in these evaluations, as they were considered to show how programmes met expectations and goals for university programmes. A first step in the assessment was to make a selection of educational objectives or goals suitable for evaluation. The evaluation was then done with the help of a number of randomly selected and anonymous MSc theses. There were many and very different perceptions of the method of using degree projects to assess the entire educational programme (Wahlen, 2012).

In addition to examining the degree projects, universities and educational programmes described the academic environment, such as resources available and the teachers' competences, as well as how quality follow-ups and quality work were carried out. This type of self-evaluation is common in Sweden.

Students' perceptions of their studies were gathered, usually with the help of different forms of questionnaires. The questions focused on how the expectations were met and whether they felt they would achieve the curriculum goals. In the same way alumni were asked about

the education and how it prepared students for working life. It has been done for a long time in Sweden but now it was formalized and got a larger weight in the evaluations.

Finally, visits to faculties and departments were made where representatives from the state authority (UHÄ) could ask questions to teachers, students and representatives of the universities.

Universities and faculties could lose their right to issue a degree. But they first had the opportunity to make improvements and report these within a year. About 10% of the evaluations showed serious lack of quality, but in almost all cases enough corrections were made. In some cases, after heavy criticism, universities decided to close a few programmes, (Holmquist *et al.*, 2015).

Current system for evaluation of higher education in Sweden

The current system for evaluations of higher education in Sweden started in 2017 (UKÄ, 2016). Evaluations today apply (1) degree certificates, (2) evaluations of educational programmes, (3) reviews of the universities' own quality work and (4) thematic evaluations.

The evaluations include four components; (a) the university's governance and organization, (b) resources and teaching environment, (c) implementation of teaching and results of teaching and (d) follow-up and retrospective actions.

In the evaluations, great emphasis is placed on gender equality, the demands and wishes of the working life and the students' views. A new element in the evaluations is how different topics are addressed in the education as gender equality and sustainable use of limited resources.

When evaluating a degree certificate, it is examined whether the conditions exist for good teaching. Further it is assessed if resources, educational environment, the teachers' competences, research connections and number etc. are sufficient. This has not been a problem for SLU, and the forest study programmes, including Euroforester, have since long been licensed.

With four to six years intervals, university programmes are evaluated. The emphasis is on actual conditions and results. Here, the results of the education are compared with the stated goals as they are described in e.g. curriculum and syllabus.

Some of the evaluations are so-called self-evaluations carried out at universities. Here, educational leaders and study directors describe strengths and weaknesses in the education from their own point of view. Assessment of degree projects (MSc theses), as a way of describing how the goals are met, is still used. But after previous criticisms, see above, this part has been reduced compared to previous cycles of evaluations. Great emphasis is placed on the students' views on the education. Representatives of the labour market in the respective sector are also asked to give a supplementary picture of the benefits of the study programmes.

Education programmes are classified as either of “high quality” or “questionable quality”. If the quality is questioned, the degree certificate may be withdrawn, but the university will have one year to improve quality. The forest education at SLU has all been given the “high quality” label.

Previously, evaluations have often been perceived as a control both from the top-down. SLU's work at the latest evaluation has been carried out in such a way that committed teachers think is much more relevant. It has been a dialogue rather than a control. Various parts of the university have been reviewed. The efforts of the university administration, the student admission unit and of the international department have all been assessed. The teachers' views on such support functions have been requested and the university also seems to have taken on views, which is greatly appreciated by those who do the teaching at the institutions. Employees are much more positive about evaluations in this new system.

The departments' work targeted at quality in education

The traditional way of working with quality at department level is course evaluations. At SLU it is mandatory and all courses are evaluated and a web-based system is used for course evaluations, called EVALD (SLU, 2019). There are a number of compulsory questions concerning prior knowledge, the time student spent on studies, the administration of the course, expectations of the course and the outcome of the course. In addition, the teachers can add their own questions. There is room for comments from the students. When the course evaluation is closed, a student summarizes and interprets the views of the participants and discusses them with the course management.

Course evaluations are a powerful tool and are taken seriously by teachers to develop courses. The results are discussed also by the faculty staff and by the student union.

The weakness of course evaluations is that the response frequency is often low and that the result can be affected by coincidences, such as bad weather in field exercises. The course evaluations are not compulsory for students and the response rate is often around 50%, but varies greatly.

Courses included in the Euroforester programme receive good to very good grades and, with a few exceptions, the grade is usually between 4 and 5 on a five-degree scale. Certain elements that get criticisms usually lead to adjustments in the teaching in coming years (Brunet *et al.*, 2018).

Evaluation of Euroforester programme by former students

National evaluations as described above are general and not very valuable to further improve the quality of study programmes and make them valuable for the working life. Student surveys could be a powerful tool, but students in general don't have perspective and experience of working life. For a study programme like Euroforester information from alumni are very valuable. Student/alumni surveys among former students of the Euroforester

programme have been done twice, 2008 and 2017/2018 (Brukas and Blicharska, 2010; Brunet *et al.*, 2018).

The last survey (2017/2018) was answered by 252 former students. Most respondents (94%) were employed, with the majority in an occupation for which their education was relevant. The survey also revealed a high level of graduates' satisfaction with their current job situation, even though there are considerable differences by country and gender. The alumni were in general very positive to the Euroforester programme, particularly appreciating student-centred pedagogy, acquisition of transferable skills and non-hierarchical relationships between teachers and students.

The Euroforester programme includes field based training and field trips in Sweden but also abroad, and these were considered valuable. Many respondents mentioned that the knowledge and generic skills acquired in the Euroforester programme was a very important contributor to their current career. In addition, many students also emphasized the long-term benefit of the networks they established during their studies.

Other conclusions from the alumni survey (Brunet et al., 2018):

- International students highly appreciate the "block structure", with courses running fulltime for 10 weeks, In total six courses, each 15 ECTS credits, in total 1,5 academic years.
- For students there is a large variety of master thesis options at the forest department in Alnarp, at other departments and faculties within SLU and the programmes international partner faculties.
- The programme has an experienced international teacher team with strong scientific background. All course leaders are active research scientists, ensuring course contents to be in line with current scientific progress.
- Students create a life-long network due to the multinational group of students sharing knowledge and experience in Alnarp and the Euroforester programme.
- There is a good infrastructure on Alnarp campus, including well-equipped lecture halls and seminar rooms, a new student residence for Euroforesters on campus, and the Alnarp park, arboretum and landscape laboratory.
- For many students the close contact to the forest sector in southern Sweden is valuable, for understanding forestry and for future employment.
- Thanks to dedicated alumni and teachers there is an active alumni network with conferences every three years (Estonia 2018, Latvia 2015, Lithuania 2012, Poland 2009).
- There is a good job market for both exchange students and Swedish students. Many 'Euroforesters' have moved on to postgraduate and academic positions. Others have been employed by state or private forest companies. Several graduates work with IKEA's international operations in forests, timber and furniture.

For the department and for the teachers working with Euroforester programme, a survey like this is important. It strengthens the perception of doing something important. It is also an important document to display to the faculty- and university-management in the fight for resources. Although in general terms, the Euroforester programme is of good quality, based

on the survey we also know what needs to be addressed in the future. Hopefully, the positive evaluation is also helpful for recruiting international students to the programme.

Conclusion

For the Faculty of Forestry at the Swedish University of Agricultural Sciences and the department in Alnarp (SSFRC), the national evaluation of the Euroforester programme is essential to obtain and keep the possibilities to graduate students and to generate resources for education. The Faculty uses course evaluations to understand, control, support and suggest changes to individual courses and programmes. For the department and involved teachers, but also for potential applicants, input from former students is most valuable in developing the Euroforester programme for the future needs of the forest sector.

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Remark: There is a quite an amount of additional literature about evaluation of higher education in Sweden at UKÄ, Swedish higher education authority, available here: <https://uka.se/> and some in English <https://english.uka.se/>

QUALITY AND COMPETENCE ORIENTATION ON COURSE LEVEL – CONSIDERATIONS AND EXAMPLES FROM FOREST WORK SCIENCE COURSES AT THE UNIVERSITY OF FREIBURG

SIEGFRIED LEWARK

Abstract

The role of competence orientation in curriculum design and quality assurance has been discussed many times at annual conferences of SILVA Network, especially at those in Valencia in 2006 and in Lleida in 2012. Competence orientation is important on the level of the curriculum, but also on the levels of the study subjects and the single courses. This orientation should be a conscious aim of teachers and learners and should be formulated in the respective curricula and course descriptions.

Realisation of such considerations is exemplified with study courses from Forest Work Science, which has traditionally been a study subject in the forest sciences programmes in Germany. This contribution focusses on courses held in the forest sciences study programme of 1995 at the University of Freiburg, which are used as examples of courses aimed at basic students' competences in ergonomics. The course objectives were achievement of knowledge of work study methods, the ability to use them, and also affective orientation.

While quality assurance in higher education is often seen in connection with formal approaches, especially accreditation, the reasoning of this contribution as well as of the examples outlined are showing that much of the quality of the learning process is realised on the level of single courses.

Keywords: curriculum development, elective courses, study course structure, expected learning outcomes, course assignments

Introduction

Concepts and criteria of quality in higher education

Going back to concepts and definitions often is helpful for structuring ideas: In questions of quality assurance, as e.g. used in business, quality has sometimes simply been defined as “fit for purpose”. A similar example is the term wood quality. So a specification of the purpose is needed, both for the objects, for which quality is to be assessed and improved, as for the quality assurance process as such. “Fit for purpose” may be transcribed as suitability according to goals and objectives of the production process, in our case of the process of education.

When transferring these conceptions to Higher Education (HE) quality shows by the degree of achieving the Expected Learning Outcomes (ELO), which are typically formulated

having potential success on the labour market in mind. The SILVA Network conference in Lleida was devoted to the ELO, definitions and their role (Schmidt *et al.*, 2014). First a definition of ELO is required, then also ways of assessment of achievement. In between, primarily to be looked at, there are the measures to go from goals to achievement, which in higher education normally are learning and teaching. In principle it is all about the learning process, in study programmes, in the single courses and in self-study, be it in connection to courses, be it beyond, e.g. extra-curricular activities.

Quality assurance then is going for and assuring quality of the learning process. We are dealing with formal education when considering learning processes in study programmes. There are formal approaches of quality assurance like accreditation or graduate surveys, or some types of course evaluation, but also many informal processes, especially on course level, which are at least as important for quality outcome as the formal ones.

Responsibility for learning quality, i.e. the achievement of ELO, at the different levels, lies with all involved in the learning process of higher education:

- Learner;
- Teacher;
- Faculty;
- University;
- Ministry.

Formal quality assurance is a periodic job, e.g. of a curriculum commission when designing or revising a study programme, or during accreditation by universities and accreditation agencies. But informal processes with impact on quality are going on permanently, as a daily job of students and teachers.

Aim of this contribution

The focus, after the basic considerations, is on quality of single courses and sets of courses under a specific subject of study, traditionally connected to a scientific discipline, for which conceptual considerations and ways of realisation will be demonstrated.

This is partly a continuation of earlier contributions to SILVA Network conferences with course examples from forest sciences studies at the University of Freiburg, especially contributions on compact courses (Lewark, 2016), on gender courses (Lewark, 2006; Jansen-Schulz and Lewark, 2016) and on the introductory course ESPRO (Lewark *et al.*, 2006). Thereby this text is once again referring to courses in the study programme on forest sciences of 1995 (Lewark, 1998), as its programme structure and the way the courses were organised were special in many ways, which allows the demonstration of reasoning and performance, also with respect to quality features. Furthermore its introduction and structure are well documented in publications in German and English, in conference proceedings as well as in journals of higher education (Lewark, 2002a; b), and in evaluation reports (Mutz, 2001; Webler *et al.*, 2000).

Background

Study programme "Forest Sciences" 1995 at the University of Freiburg

For many years before 1995 there were only minor adaptations of the study programme, that was similar to that of the other forestry faculties in Germany. The Faculty of Forestry was determined to make major changes of the forest sciences studies this time. The study programme of 1995 is suited for demonstration for several reasons:

- Goals and ELO have been formulated for the first time;
- An innovative curriculum structure had been prepared by a thorough discussion, inside and outside the faculty;
- There was didactical support from outside;
- Formative external and internal evaluations were done for the first time.

A comparison with the study programme before this fundamental revision of the programme (Lewark, 1998) would today be only mostly of historical interest. In a similar vein, comparing the study programme of 1995 with the large number of BSc and MSc programmes of today could lead to illuminating insights, but this is also not the aim of this text and could not easily be done.

Hence, describing some of the innovative structural elements of the reform of 1995 will be helpful here for understanding the line of argument, as they had an impact on the quality of the learning processes. But it should be stressed that great impact also came from encouragement of teachers to use a variety of forms of teaching based on the structure, which will be demonstrated with the sample courses in the next section. Before the revision a high share of the excessive load of obligatory teaching hours was done by plain lecturing, without an obligatory presence of students. Task oriented course organisation was encouraged in the interest of competence and learning by doing.

Students were encouraged to be self-responsible for learning. Self-study and different ways of performance and responsibility for the attempted individual competence profiles required the "active learner". There was a great choice of elective courses, and the possibility to make choices has been named as very important in discussions with students (Schneijderberg and Lewark, 2014).

The 1995 revision of the study programme in Freiburg was also responding to new legal regulations, which were limiting the number of teaching hours in a study programme. This posed difficulties as on the other hand every professor had to do a certain number of teaching hours, which summed up to more than the limited number of programme hours would allow. The solution was to offer more electives than before. In the study programmes after implementation of the Bologna structures, this dilemma did not exist anymore, rather teaching input from external experts was needed.

The changes in the revised study programme, in addition to those already addressed, of relevance in our context included 20 contact hours per week scheduled, leaving room for 20 hours of self-study. One half of contact hours scheduled for obligatory courses, the other half for electives.

- Guided self-study encouraged, with feedback;
- Different ways of performance and assessment encouraged;
- Extra credits given for additional, selectable assignments of different size, offered either by lecturers or students, adding to choice and also an initiative for individual competence elements.

The block study structure allowed and supported all this. Surprisingly the regulations gave more room for innovative and new structural elements than expected.

After ten years, the study programme of 1995 has been replaced by other study programmes enforced by the top-down regulations following the Bologna process as the legal and regulatory framework are different in many respects. At the same time organisational changes in the university and mergers with parts of another faculty have led to more subjects and more different study programmes. Certainly the actual study programmes are more strictly regulated, in particular the BSc programmes.

Some innovative elements of the reform of 1995 have been transferred to the new study programmes. The introductory project ESPRO and the block study structure have been adopted in the Master programmes. Also the module handbook was issued in a similar way as before, including entry of ELO on course level. Other elements mentioned as quality characteristics contributing to learning success are no more included in the new study programmes. Especially the BSc programmes seem to leave less didactical freedom for teachers, less choices for the students and less variety of courses. Reducing the self-responsibility bears the risk of students of relapsing into old roles, primarily only following the regulations and demands.

Course examples from Forest Work Science

From ELO to course development

The idea of this section is to trace the development of single courses, especially with respect to ELO and contents, beginning from a general description of competences in a field of study, in this case Forest Work Science. The text will follow the presentation held at the SILVA Network conference, which itself is based in parts on a presentation given earlier at a IUFRO congress¹.

In English often the term Ergonomics is used instead of Forest Work Science. For both and similar other names of the scientific discipline there is a huge number of definitions, like those in Figure 1.

¹Lewark (2017)

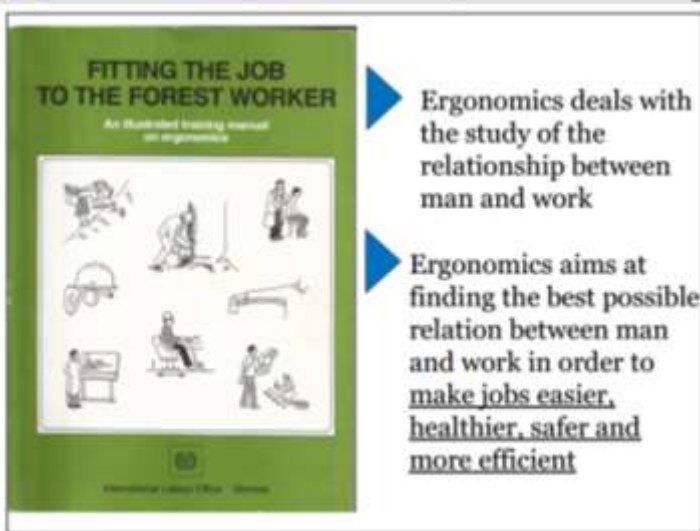


Figure 1: Definition and aims of Ergonomics in forestry by the International Labour Organisation (ILO, 1992).

The International Ergonomics Association (IEA) also defines in detail competences required of “practitioners of ergonomics and ergonomists” (Figure 1). This detailed definition, formulated for specialized ergonomists, will be helpful for understanding, but goes far beyond the level which can be achieved in courses of Forest Work Science in study programmes of Forest Sciences. A simple formulation, for forest work, is used in an older Training Manual on Ergonomics, named *Fitting the Job to the Forest Worker* (ILO, 1992) in Figure 2. In principle it is about men at work, their abilities, attitudes, performance and working conditions.

Teaching in Forest Work Science started with a short introduction of three days in an obligatory block course Forest Economics and Work Science. After that a great number of elective courses were offered, as the study programme of 1995 gave the chance to break down teaching in a study subject into single elective courses. A selection of them is listed in Figure 3. Some of the electives were held many times, like Stress and Strain, more than twenty times in ten years, which was presented at an earlier SILVA Network conference (Lewark, 2016). Others were held a few times and still others held only once. These last ones were often connected to visits of fairs of forest operations and machinery, which gave the occasion for quite specialized assignments, like in the third course example of Table 1.

Other courses, not included in Figure 3, had topics like work study, work organisation, safety and health, labour markets for forestry graduates, and methods of scientific work and writing, using examples from Forest Work Science.

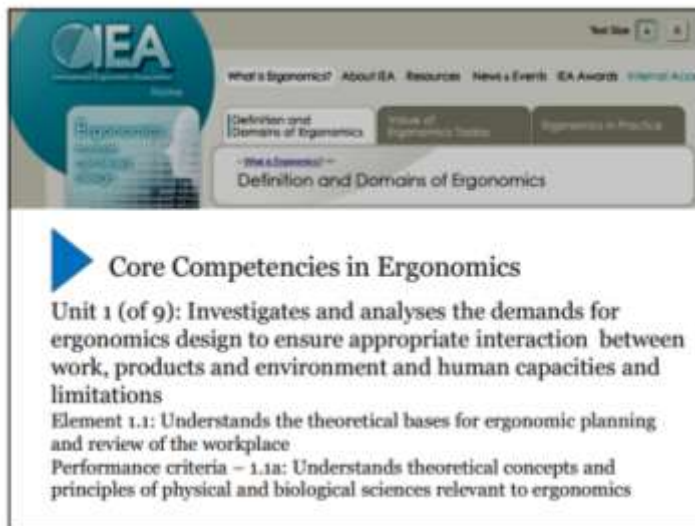


Figure 2: Core competencies in Ergonomics in a definition by IEA (2001).

Forest Work Science: many electives

- ▶ Forest ergonomics – online (English)
- ▶ Work study I, one week (German)
- ▶ Work study II and forest technology, one week (German)
- ▶ Work conditions & ergonomic work design in tropical forests, one week (German)
- ▶ Psychology aspects of forest work organisation, one week (German)
- ▶ Gender analysis and forestry, one week (German), two weeks (English)

Figure 3: Selected examples of electives in the study subject of Forest Work Science.

Contents and ELO of some courses

A few courses have been selected to serve as examples with further details. Contents as well as some other features with relevance to quality of the learning process are presented in Table 1.

Table1: Details of three elective courses in Forest Work Science.

	Work study I(Stress and Strain)	Work study IV (Work psychology)	Work organisation, safety and health at INTERFORST fair
Contents	Stress and strain in forest work	Mental strain, work structuring, social working conditions	Safety and health in modern work systems
Study object, studied operation	Pruning	Concept of semi-autonomous group work	Exhibition of modern forest machines at a fair
Didactical approach	Demonstrations of operation, data assessment and evaluation, self-study, additional task	Concept presentation by its developers, analysis of evaluation instruments and results, group task	Development of observation check-list, interviews, assessment analysis in groups, poster presentation
Objectives	Knowledge, skills, affective orientation	Knowledge, skill of analysis using psychological activity assessment instruments	Knowledge, analysis and presentation skills
Task	Stress and strain study, time study, design, execution, evaluation	Design of interview for socio-technical system analysis	Analysis of machines with respect to safety and health
Expected learning outcomes	Ability for planning, application and evaluation of work and time study	Ability for application of psychological work analysis instruments	Ability to analyse work organisation and safety and health at work
Assessment	Group work results, self-study results, extra assignments (extra credits)	Group work results, self-study results, extra assignments (extra credits)	Group work results, self-study results, extra assignments (extra credits)
Attempted transferable skills	Ability for structuring and executing of tasks, presentation technique	Ability for structuring and executing of tasks, presentation technique	Design of analysis instruments, poster presentation
Teachers	Lewark, Karmann, Mühlsiegl	Lewark, Kastenholz, Westermayer	Lewark, Mühlsiegl, Brogt

The tasks and projects worked out in the courses were always closely related to real working life situations, which is generally appreciated by the students.

Extra assignments

A special feature of the elective courses were extra assignments. The purpose was to give the students an impulse to take initiative for an extra task leading to additional experience and competence, honoured with additional two to six credit points, according to workload. The credit point system required a minimum number of credit points from extra assignments in the four fields of study, thus giving some choice between basic credit points gained directly from successful participation in electives and credit points from these assignments.

Box 1: Assignment proposed at the spring school GenCom (Developing Gender Competences in Higher Education Programmes on Natural Resources Management) (Lewark and Karmann, 2015).

Exploring an internet site of a large international organisation

Idea:

In the field of environmental management there are a lot of international organisations with vast internet sites. These sites all include gender aspects, in very different ways. So exploring and analysing this would add valuable information to our course as well as to your competence. The idea is to share the job and to inform each other about the outcome.

What to do:

- You decide about the international organisation to focus on, for example FAO, ILO, CIFOR, GTZ or World Bank – or find another one yourself.
- Have a first look and then decide on the leading questions you want to explore, please state your search questions in your documentation.
- Then document your main findings
- Draw your conclusions which you want to tell the others.
- Upload the report in the MOODLE e-learning platform for the spring school.
- Have a look at the documentations and conclusions of the others (at least one) and give your comments, in the e-learning platform.

Assignment on gender quota and affirmative action

Idea:

Affirmative action and gender quota are widely discussed and in some cases adopted. The idea is to find out about the concepts and processes in this respect and the views of people concerned and discuss pros and contras of the actions taken.

What to do:

- Decide about one country (situation, trends of development, comments) or two countries (comparison) to concentrate on (home country, guest country, other good example) for your assignment.
- Search for relevant information in the web and / or in libraries.
- Write a text of 1200 to 2000 words according to standards of scientific writing (style, references).
- Upload the text in the e-learning platform.

Assignment on Property rights and inheritance patterns – gendered?

Idea:

Property rights, user rights and rights of access to resources of natural resources, especially to forests and forest resources are crucial for many people worldwide. These rights are often based on regulations and patterns of inheritance.

What to do:

- Decide about one country (situation, trends of development, comments) or two countries (comparison) to concentrate on (home country, guest country, other good example) for your assignment.
- Search for relevant information in the web and / or in libraries.
- Write a text of 1200 to 2000 words according to standards of scientific writing (style, references).
- Upload the text in the e-learning platform.

Such extra assignments could e.g. be essays or empiric studies, like follow-up of studies done in a course. They would be proposed by the course organiser, who showed examples of assignments done before, or proposed by the student. In the mentioned courses of Forest Work Science e.g. interviews of forest workers have been done about work motivation or work satisfaction or accidents experienced, or evaluations of exposition stands at the fairs,

all connected with the course contents exemplified in Table 1. Examples of assignments proposed by the course organisers may give an impression of formulations of assignments, from still another course (Box 1), which were also serving the interaction between the course participants.

Evaluation

Course evaluations by students and with students came into use in Freiburg in the 1990s on a voluntary basis, so they were not regularly done at that time. There was no standardized procedure, with, for its part, all its implications including proper statistical handling and issues of comparability and publication (Lewark, 2001).

In the courses mentioned as examples here a mindmap (Figure 4) was used as questionnaire, modified each time for the respective course (Hartung, 1995). Comparability was thus given among the evaluations of Forest Work Science electives. The questionnaire was filled in at the end of the course and evaluated immediately with frequency distributions. Then the results were presented and discussed with the course participants. This procedure proved to be well accepted and useful for its purpose.

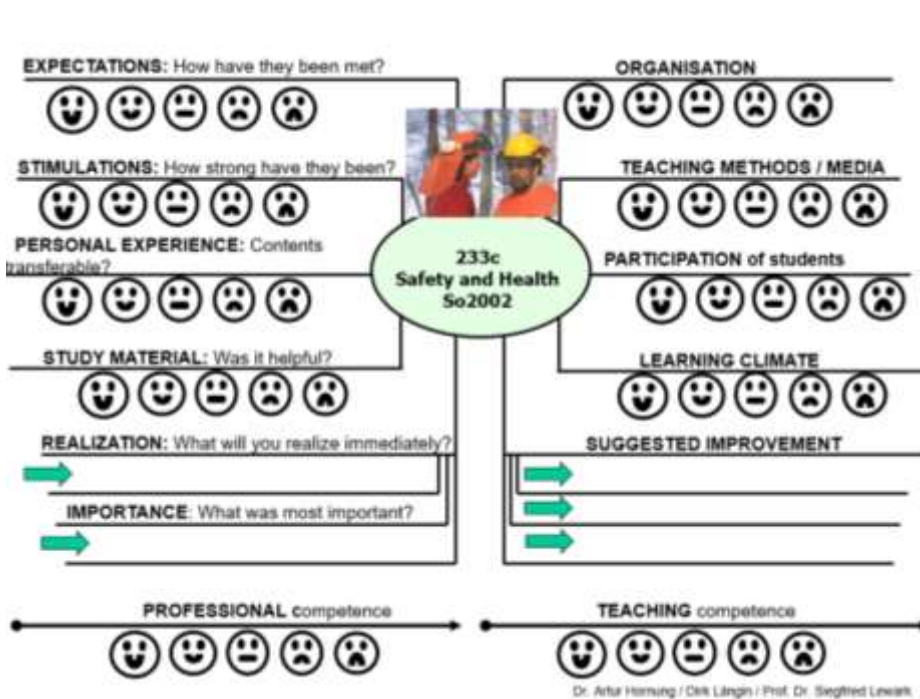


Figure 4: Mindmap for evaluation of an elective course in Forest Work Science.

Assessment

In the study programme of 1995 the credit point system served to steer and administrate the course participation. Each course was concluded with an assessment, the compulsory courses mostly with written tests, while the elective courses were assessed with a great variety of performances. There were no credits given for only sitting in the course. The

degree in which these regulations were binding was one of the innovations, which was intensively discussed at the beginning. But the completion of the studies was still done in a more traditional way, by written tests in a preliminary examination and written tests plus oral exams in the final examination.

Whereas traditionally there was no training for the written and oral examinations, in the study programme of 1995 the frequent testing as described served also for preparation of the preliminary and final examinations. In this context the performance at the electives had special importance, as the results of empirical studies and group work were regularly presented in the plenum. The extra assignments with their variety of approaches and methods also were a good preparation for the choice and the execution of the diploma thesis, which got considerably more weight in the final marks. All this contributes to the quality of the learning process and the performance of the students as well as their competence.

Concluding remarks

While quality assurance in higher education is often seen in connection with formal approaches, especially accreditation, the reasoning of this contribution as well as the examples outlined are showing that much of the quality of the learning process is realised on the level of single courses. The characteristics of the courses presented, including their contents and structural elements under a single study subject, clearly underline this.

The examples taken here are from a special HE environment in a study programme, that was designed to encourage the development of a variety of courses and approaches intended to result in individual competence profiles of the graduates, based on a broad choice of learning paths and students in the role of self-responsible active learners. The approaches were using tasks focussing on real working life problems, in the sense of task oriented or problem based learning. Such approaches are limited by regulations, but the experience with the implementation and running of the forest sciences programme of 1995 at the University of Freiburg proved, that the regulations may give a wider frame of learner orientation by varied course structures and teaching methods than often expected, provided that there is a will to make changes according to the learning paradigm.

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INTERNATIONAL E-LEARNING COURSES WITHIN FOREST SCIENCE MSC PROGRAMME AT THE UNIVERSITY OF PADOVA, IN ITALY: POTENTIAL AND CHALLENGES FOR QUALITY ASSURANCE

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Abstract

Following the increasing demand for digital learning, the University of Padua, in Italy, introduced its first e-learning course to forest science disciplines in 2006, jointly with other European universities through the Erasmus Mundus programmes SUTROFOR, SUFONAMA and MEDfOR. More recently, another course was added thanks to the ECOSTAR project which was funded by the Erasmus+ Knowledge Alliance programme of the European Commission. Currently, e-learning courses based on intensive online interaction with students are well consolidated in the Forest Sciences MSc programme, while Massive Open Online Courses (MOOC) are being tested. Several lessons can be learned from the experience so far. The most prominent of these relate to the challenging issues around the administrative bottlenecks for the enrolment and management of external participants who are not formally enrolled in partner universities (i.e. students from other universities or non-academic practitioners). Changes are needed to tackle these issues to increase the potential of e-learning. Such changes include making administrative rules more flexible and digitalized, providing enough resources to have an adequate ratio between e-students and educators and train the latter in communication techniques and technologies (e.g. video making, story-telling).

Keywords: e-learning, forest science, online interaction, quality assurance, higher education

Introduction

In the recent past, many universities have been delivering e-learning courses as integrative teaching activities, to complement traditional frontal lessons (blended learning and courses entirely based on distance learning). However, during the last years, e-learning courses assumed a growing role in structuring the fundamentals of study curricula. This can be seen as a consequence of various factors. They include an increasing use of innovative digital information technologies (Hong *et al.*, 2019), an increasing demand for high-level qualifications (European Commission, 2017) and for innovative and participatory-oriented teaching techniques, and information globalisation. The increasing competition among universities in attracting highly motivated international students has also played a role in this. This has resulted in universities getting higher international visibility and reputation and obtaining human and financial resources for dealing with the increasing number of students. In Europe it seems “clear that effective education and training systems are a

foundation of fair, open and democratic societies and of sustained growth and employment” (European Commission, 2017, p. 2). This sustains that there is growing attention towards higher education and skills development. Well-designed higher education programmes and curricula can take advantage of the new options offered by technologies and solutions for distance learning, “including open, online and blended learning that increase flexibility and teacher-student interaction” (European Commission, 2017, p. 5). Potentially, digital learning helps governments to achieve emission reductions targets and may be the only solution during a pandemic. Getting the multiple benefits of attracting international students, increasing the visibility of universities and innovating teaching capacities, various distance-learning options have been created within international education programmes also in forest sciences and related disciplines. The University of Padua, in Italy, jointly with other European universities, has been running e-learning courses in forest science disciplines since 2006. Indeed, it has been progressively increasing the options for attending these courses for students regularly enrolled at the University to other, external, users. In terms of quality assurance of study programmes, this shift implies various challenges that are briefly described and discussed hereafter. In particular, the present contribution aims at sharing the lessons learned from the experiences developed within the international MSc programme on Forest Sciences at the University of Padua.

An overview of e-learning courses

Teaching media have been changing radically with the evolution of the digital age, by the use of Internet and e-learning tools. Nowadays, a set of educational resources and activities, open to all interested users or restricted to paying ones, are available (see Figure 1): traditional synchronous classroom-based learning activities organized on campus (i.e. lectures, labs, field training) and online resources (e-learning). Blended learning based on combinations of traditional on-campus activities and online learning are playing an increasing role in many higher education systems.

According to Serdyukov (2015, p. 61), “online learning creates a learning environment that, compared to traditional, classroom-based education, is less personal, more independent, often fragmented, rarely systemic, distributed in space and time, and dependent on the learner rather than on the teacher”. However, differences exist between two main types of online courses that are used in forest sciences as well as in other disciplines, namely a) intensive interactive e-learning courses, and b) Massive Open Online Courses (MOOC). Both types of courses can be associated with the recognition of ECTS. Their main general characteristics are described hereafter.

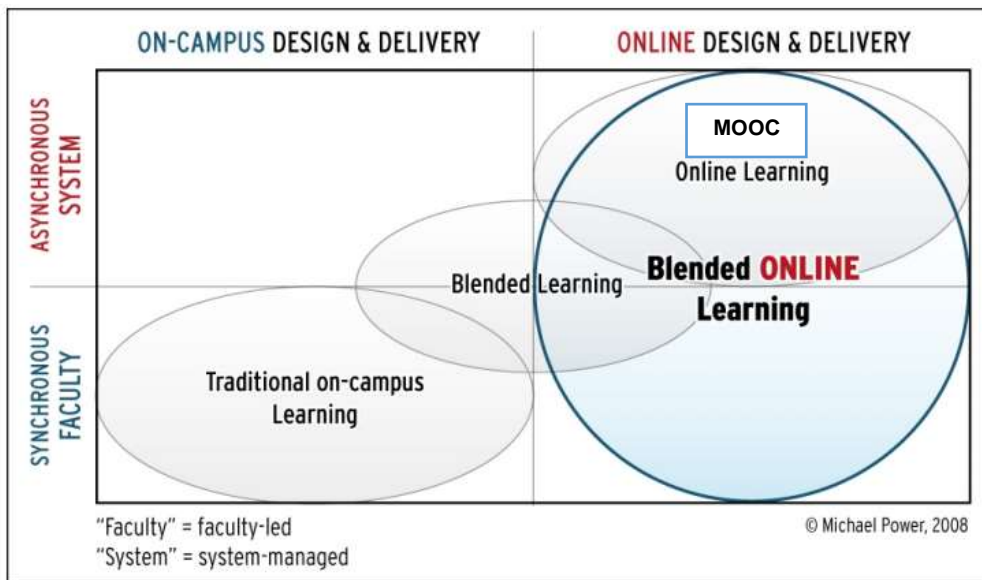


Figure 1: Different types of learning tools. Source: Power, 2008 (modif.).

Intensive interactive e-learning courses

In interactive e-learning courses, also named e-modules, are typically delivered in pre-defined weeks and periods: one e-module can last one to two weeks, depending on the topic; while the entire e-course encompasses five - six e-modules or more, depending on the number of ECTS. These courses are typically run once a year, during a specific semester, and are formally embedded in the study programme – being delivered within the university e-learning tools (e.g., Moodle - Modular Object-Oriented Dynamic Learning Environment; Absalon or others). During these pre-defined periods, teachers (e-moderators) have to guarantee intensive and continuous interactions with the enrolled students, inspiring discussions (in online forums) and providing stimulus to further and deeper reflections by students. The teaching material includes texts and videos prepared by the teacher(s)/e-moderator(s), readings, links to web sites, Power Point presentations and others. In-course activities are designed, and specific tasks assigned to attending students, who have to respect intermediate and final deadlines for each e-module. The online interaction results in creating a course-community among students and teachers and a collaborative learning experience. The core aspect of this type of course is the creation of a good and "direct" relationship between each single student and the teacher(s)/e-moderator(s): when a student is not active for a while, the teacher(s)/e-moderator(s) has/have to directly contact him/her with a personal e-mail message to check whether there are technical reasons for low online participation (e.g., difficulties in regularly accessing internet, personal troubles), and re-motivate the student to actively contributing. This prevents and reduces the risk of dropout, but it is challenging for the teacher(s)/e-moderator(s) particularly when the number of students is high compared to the number of e-moderators (e.g., more than 30-40 students/moderator). The final evaluation of student performance is done by the teacher(s)/e-moderator(s), on the basis of a final assignment or questions. The whole course structure and functioning mechanisms allow for the creation of a highly dynamic learning environment.

Massive Open Online Courses (MOOCs)

In the case of MOOCs, e-modules are “made available over the Internet without charge to a very large number of people: anyone who decides to take a MOOC simply logs in to the website and signs up” (Oxford Dictionaries Online - <https://en.oxforddictionaries.com/definition/MOOC>). Typically, a course is structured – as in the interactive e-learning courses – in weeks and associated topics. Enrolled participants can ask for clarifications and provide comments on elements of the online course; typically, these comments are managed by one or more tutor(s) who provide feedback. Online discussion forums are part of the teaching tools, together with texts prepared by the teacher(s)/e-moderator(s), videos, recommended or compulsory readings, Power Point presentations, links to web pages, etc. However, despite the structure being very similar to other types of e-learning courses, in MOOCs the interaction between students and teacher(s)/e-moderator(s) is mainly driven by the interest and motivation of students. With the high number of participants that characterise MOOC (in principle, thousands of students can take the same course at the same time), the performance of students, for the most part is based on their willingness to learn and their self-engagement. Students are guided to intermediate self-evaluation forms that allow them to understand whether they have acquired (or not) the expected learning outcomes at the end of each e-module. Often, the final step is also a self-evaluation, with online quizzes and tests that students autonomously fill in to check whether they have acquired the minimum amount of knowledge required to pass the course. E-moderators of MOOCs tend not to set students with complex final assignments (such as a written essay), as it would be hard to evaluate them as teacher(s)/e-moderator(s) do in other courses with lower numbers of participants. The result is an approach that appears more static and less interactive. In addition, as MOOCs are available for free to anyone interested, regardless of academic achievement, participants may have a high dropout rate (Hong *et al.*, 2019). However, despite some limits (a certificate from a MOOC is not the same as a university degree), these types of online courses are providing access to world-class education to anyone interested in the topic and having an Internet connection, and this opens enormous possibilities. Amongst the various platforms offering MOOCs, the three top ones are Coursera, edX and FutureLearn (<https://www.reviews.com/mooc-platforms/>).

Case study: e-learning courses within the Forest Science MSc programme at the University of Padua

The University of Padua has been running e-learning courses in forest science disciplines since 2006, linked to three Erasmus Mundus programmes (SUTROFOR, SUFONAMA and MEDFOR) jointly organized with other European universities in three consortia. All three are interactive e-learning courses delivered on the Moodle platform based on a wide range of activities: task assignments (with individual and group work of the students on readings provided online), developing, posting and commenting intermediate assignments; discussions in online forums with the teacher(s)/e-moderator(s), as well as with their e-fellows (the other enrolled students); and written assignments for the evaluation of student performance at the end of the course.

In particular, the first online course launched and provided since 2006, is “Climate Change and Tropical Forestry: Monitoring and Policies” (6 ECTS), offered within the Erasmus Mundus MSc programmes on Sustainable Tropical Forestry (SUTROFOR – <https://sutrofor.eu/>) and Sustainable Forest and Nature Management (SUFONAMA – <https://em-sufonama.eu/>) under the agreement with the other European universities of the Consortia². Approximately 20-25 students attend the e-course each academic year, with two e-moderators engaged in teaching (one professor and one assistant). The evaluation of the performance of students is based on the quality and regularity of online activities (50%) as well as on the quality of a final written assignment (50%).

In 2013, a second course was introduced, titled “Research Project Development and Methodology – Applications” (4 ECTS), within the Erasmus Mundus MSc programme on Mediterranean Forestry and Natural Resources Management (MEDfOR – <https://www.medfor.eu/>), in agreement with the other European universities of the consortium³. Approximately 10-25 students attend the e-course each academic year, with one professor in charge as e-moderator. As with the previous course, 50% of the evaluation of the performance of students is based on the quality and regularity of students attending online activities and 50% on the quality of the final written assignment.

Finally, in 2017, a third online course was introduced as one of the outputs of the ECOSTAR project (www.ecostarhub.com), funded by the Erasmus+ Knowledge Alliance programme of the European Commission. The course focuses on “Ecosystem services entrepreneurship: from ideas to business” (6 ECTS) and aims at guiding students and professionals to acquire high-level entrepreneurial skills by working with the private sector, to convert innovative ideas into successful business plans for impact investments in the field of natural resources. In its first edition (2017-2018), it was coordinated by the University of Padua and jointly delivered with the contribution of all the project partners⁴. In total, 15 e-moderators were involved (one professor and coordinator, one assistant, several lecturers who were initially trained for guaranteeing consistency in the teaching approach) for providing 150 learning hours/student. The second edition (2018-2019), which was run at the end of the ECOSTAR project, was coordinated and delivered by the University of Padua with the contribution of the Universidad Politécnica de Madrid. The evaluation of the performance of participants was based for 25% on the quality and regularity of online activities, 25% on the quality of a mid-term assignment and 50% on quality of the final

² SUTROFOR: University of Copenhagen, Faculty of Science, Department of Food and Resource Economics, Copenhagen (Denmark) (Coordinator); Bangor University, School of the Environment and Natural Resources, Bangor (UK); Technische Universität Dresden, Institute of International Forestry and Forest Products, Tharandt (Germany); AgroParisTech, Paris Institute of Technology for Life, Food and Environmental Sciences, Montpellier (France). SUFONAMA: University of Copenhagen, Faculty of Science, Department of Food and Resource Economics, Copenhagen (Denmark) (Coordinator); Bangor University, School of the Environment and Natural Resources, Bangor (UK); University of Göttingen, Faculty of Forest Sciences and Ecology, Göttingen (Germany); Swedish University of Agricultural Sciences, Southern Swedish Forest Research Centre, Alnarp (Sweden).

³ MEDfOR: University of Lisbon (Portugal) (Coordinator); University of Lleida (Spain); University of Valladolid (Spain); University of Tuscia (Italy); Karadeniz Technical University (Turkey) and Catholic University of Portugal (Portugal).

⁴ They included Ecosystem Marketplace – Forest Trends (United States of America), the Universidad Politécnica de Madrid (Spain), the University of Manchester (UK) and the University of Brasov (Roumenia).

written examination. In total, 156 people participated to the first edition, of which 67% were students formally enrolled in the project-associated universities at various levels (BSc, MSc and PhD); these students attended the e-course for free. The remaining 33% of enrolled participants were non-students, e.g. young professionals who wanted to start their own businesses; these participants paid an enrolment fee. Out of 156 participants of 26 different nationalities from 9 different EU countries, 135 were very active but only 69 (corresponding to 51%) completed the e-course by submitting the final assignment. On the basis of an anonymous evaluation form that participants were required to fill in at the end of the e-course, 93% of participants were satisfied, as the e-course met their expectations, and 78% thought that there was not much duplication/repetition of contents with other courses offered by their universities or other organizations. Similar percentages, but with a lower total number of participants (47 in total; 12 of them were self-paying participants not regularly enrolled at the University), characterized the second edition.

Table 1: Summary of the two editions of the ECOSTAR e-learning course.

	1st edition	2nd edition
Academic year	2017-2018	2018-2019
Partners participating in online activities	6	3
Number of e-moderators	15	4
Number of participants	156	47
Percentage of students enrolled in partner universities	67%	75%
Percentage of participants not enrolled at a university	33%	25%
Enrollment fee for students	No	No
Enrollment fee for other participants (external)	Yes	Yes
Percentage of participants who completed the course	51%	97%
Percentage of participants satisfied (course met their expectations)	93%	91%
Percentage of participants who thought the course did not replicate/duplicate other courses	78%	82%

In Table 1 a summary of the two editions of the ECOSTAR e-learning course experience is presented.

Potential and challenges for quality assurance of innovative e-learning courses: a reflection based on the case study

Several lessons can be learned for online courses within forest sciences based on the experience that the University of Padua has acquired so far. However, two main themes are relevant for the issue of quality assurance: i) the participation to and successful completion of the course by participants who are not enrolled in partner universities (students from other universities or practitioner); ii) the fee for enrolling in a single course. These themes are clearly interconnected to each other, and briefly discussed in the following.

Participation and management of university vs. non-university students

The first two e-courses, based on interactive online activities, and delivered within the Erasmus Mundus SUTROFOR, SUFONAMA and MEDfOR programmes, were offered to one category of users only: students regularly enrolled in one of the abovementioned programmes. Thus, with some adjustments, they followed the ordinary procedures for evaluation, credits' recognition, exams (based on a written final assignment that students had to upload in the online system), etc. As already mentioned, ECOSTAR was a special case of e-learning course. Being oriented towards technology transfer to support training of entrepreneurs interested in creating innovation and new nature-based business, the e-course was designed for a broader target and had a remarkable presence of non-university participants from all over the world. Moreover, the e-moderators were coming from other partner universities, and from businesses with experience in relation to the subject, an organizational feature that has greatly increased the challenge of coordinating and fine-tuning for teachers (e-moderators). It is worthwhile mentioning that the moderation and case studies brought from the business sector highly contributed to increasing the interests of participants toward applications and job-orientation of the scientific contents. But also the opposite, i.e. knowledge brought from the students, has positive effects on the collaborative learning dynamics. Finally, the design, management, evaluation and integration of such a complex course into the University of Padua curricula raised several problems with the internal procedures and technical management of the e-course, that are quite rigid and somehow obsolete with respect to the dynamics of the global demand for high-quality online education. For example, only students who are enrolled at the University of Padua are automatically recognized by the IT system and allowed to access Moodle with their own credentials. For all the other (external) participants a special procedure is needed to provide them with access, with the involvement of the IT staff (who have to create individual access login codes), the teacher/e-moderator (who has to make a formal request to the IT staff for the technical aspects, and to the president of the MSc programme for the authorization). This procedure in itself is not particularly long or complex, but several problems arise when external participants try to access the platform for the first time, for example, access issues due to login codes not working (which then have to be re-generated and re-sent to the interested participants). Other problems such as the participants experiencing (sometimes temporary) difficulties in recognition by the system and asking for assistance via e-mail, and other technical issues associated with, for example, the malfunctioning of participants' e-mail addresses. All these technical issues need to be solved prior the beginning of the online activities, to guarantee that all participants are ready to access and start when the e-lessons are scheduled to start. With a high number of participants, as was experienced during the first edition of ECOSTAR, these technical adjustments require extra time that need to be taken into consideration when allocating resources.

Payment for single courses in case of non-university students

Another issue is the amount of fees for payment of single courses. Universities typically allow persons not enrolled in a full BSc or MSc programme to attend single courses, for which they are required to pay a specific fee. The fee covers administrative costs such as those needed for the individual enrolment, assignment of identification codes, emission of invoice, regional tax and stamp duty, and the issuing of a final certificate once the student has passed the exam. The fee amount varies significantly depending on country and

university. For example, at the University of Padua, for the entry level fee for participation to a single course of six ETCS at the MSc level the current fee is 224.50 Euro (and 200.00 Euro for any additional single course, and up to five courses in total) (<https://www.unipd.it/en/tuition-fees>); at the University of Copenhagen, the fee for a single course of seven and a half ECTS at the MSc level for EU students is 7,500 DKK (ca. 1000 Euro) (see <https://jura.ku.dk/english/education/continuing-professional-education/singlemasterlevelcourses/>), which is considerably higher. Despite these differences, both fees seem significantly high with respect to the costs that a non-academic practitioner is willing to pay for attending an online course, even if delivered by a university, and especially if compared to prices offered by Coursera and other platforms. On the one hand, external users, like nature-based entrepreneurs who participated to ECOSTAR course, are more interested in advancing practical knowledge associated with the topic, rather than acquiring a top-quality academic qualification and they might find alternative courses delivered by other organisations, at lower prices (or for free, if provided by means of MOOCs). On the other hand, in certain topics that are very innovative and at the frontier of research, only universities or other high education centres might have advanced knowledge to be transferred to practitioners. Therefore, the challenge is finding a better balance between the need of covering the internal administrative costs for the university, and the need of keeping the fee for single courses low in order to attract external and unusual “customers” (such as entrepreneurs). This would also help to reinforce the technology transfer capacity of the university. Moreover, because of the complex internal procedures needed to follow each single student along the whole process, in the case of a high number of students attending a single course (such as ECOSTAR in its first edition), bottlenecks in the system are very likely to happen. The problem was solved by assigning the management of external participants to the spin-off of the University of Padua, Etifor, which was the coordinator of the ECOSTAR project and is a private company. Etifor managed the enrolment and evaluation process of those participants who were not-university students in a more flexible way, until the issuing of the certificate. In this way, the fees remained lower and thus attractive for more participants, while the risks of administrative bottlenecks due to the processes for individually managing a high number of external participants on the basis of strict and inflexible administrative rules of the university have been prevented. However, the quality of the evaluation process was safeguarded because the same criteria were applied by the same teachers/moderators to all the participants, whether they were university students or not.

In Table 2, a summary of the positive and negative aspects deriving from a quality assessment of the ECOSTAR e-learning course experience are presented.

Concluding remarks

Digital learning activities are becoming a common component of higher education both in the form of blended learning and of specific e-learning courses. As with any radical innovation, the offer of e-learning courses is associated to some changes in the organization of higher education institutions.

Table 2: Summary of the quality assessment of the ECOSTAR e-learning course.

Positive aspects/potential for improvement	Negative aspects/challenges
Diversification of the courses offered by the University	Shorter/simplified scientific contents
Flexibility of the e-modules' schedule (time-complementing frontal lessons)	Need for special skills (e.g., qualified e-moderators, communication/video design and recording teams)
Attraction of high number of participants from all over the world: internationalization, increased visibility and reputation of the involved universities	More human resources needed than in traditional courses (ideally there should be one e-moderator/lecturer every 12-15 students)
More inclusive teaching techniques, as suggested by our "Teaching4Learning@UNIPD" pedagogical specialized team, to increase the level of students' satisfaction and performance	Different administrative procedures for the enrolment of the internal students and the external (self-paying) participants
Easier involvement of experts/lecturers from other universities/organizations	Problems of ECTS formal recognition and issuing of a certificate by University of Padua for the external participants

In our experience of quality assessment of e-learning activities at the University of Padua, the most relevant changes needed are:

- Reforming and digitalizing some internal obsolete administrative procedures for the enrolment of students and external participants, the payment of the enrolment fee, the provision of the access to the online resources, the issuing of the final attendance certificates;
- The recognition of an adequate number of ECTS for the online courses;
- The selection, coordination and payment of a coordinator and e-moderators;
- The didactic support to the coordinator and the e-moderators (training on the organization of the online resources, technical support to prepare storyboards, videos, etc.);
- The involvement of businesses and practitioners to make scientific knowledge more contextualized and viewed from a practical and job-oriented point of view.

With the advancing progress in the use of blended learning, the overall system has to revise its quality assurance system. Such a revision is nothing new: experience was gained internationally by the universities involved in e-learning and in MOOC development and in Europe by some organizations like the European Association for Quality Assurance in Higher Education (e.g. Grifoll *et al.*, 2009). We are confident that the progress in e-learning will increase the overall intelligence, innovation capacity and competence within the university organisations and make them more prepared to the challenges of the digital age.

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FORESTRY STUDENTS' OPINION ON COURSE EVALUATION PROCEDURES

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AND PAOLA GATTO**

Abstract

This report presents results from a survey on forestry students' opinions of the evaluation procedures adopted at University of Padova for forestry-related courses. The poll was organized by the forestry students' association – AUSF. The data allowed a better understanding of the student's perspective regarding their engagement in quality assessment of single courses and how students perceive importance of course topics. Results show that students think that their feedback through the online and paper feedback forms is important. Even if their appreciation of the overall importance of the procedure is very high, the perceived importance of the single methods used (paper and online feedback form) does not vary much. Regarding the importance of course topics, the responses have a high variance, showing that opinions are not homogeneous. This can be interpreted as study programmes providing a good mixture of topics, even if students do feel that some topics are more important than others and are not so much weighted in the course offer.

Keywords: course evaluation, student engagement, forest science, quality assessment

Introduction

Understanding students' perception of the efforts of didactics, in terms of offered courses and learning methods, plays an important role in improving higher education. The role of students has evolved to being more active and proactive in both the way they learn and interact. Several SILVA Network conferences have provided insight on this matter, for example in Tartu, Estonia, where the focus was on the “learner” (Schmidt, 2017). Activation of the learner is not just related to lectures but can also be related to participation in evaluation phases regarding quality and choice of teaching contents. Quality management was the topic of the SILVA Network Conference held in Padova, Italy, in 2018, titled “Quality management and accreditation for study programmes in forest sciences and related disciplines”. Quality management and accreditation in the University of Padova implies various activities, some of which see students in an active role.

The objective of the investigation reported about here is to understand the opinion of the forestry students on the choice of course topics that are offered and on the evaluation process from the students' side.

Methods

This investigation included an online questionnaire that was created to receive anonymous feedback from students regarding three study programmes at University of Padova, listed in Table 1. The respondents were BSc Forest Science students and MSc Forest Science students of the University of Padova.

Table 1: Study programmes targeted by questionnaire.

	Study Programme	N. Responses
TFA	Forestry and Environmental Technology (Bachelor degree, in Italian)	29
SFA	Forestry and Environmental Science (Master degree, in Italian)	39
FS	Forest Science (Master degree, in English).	8

The questionnaire was divided into two sections. The first section regarded how students perceived the importance of the various evaluation methods of the single courses and included multiple choice questions and an open question. The three multiple choice questions and possible answers are shown in Figure 3.

How much do you think that the **ONLINE questionnaire** is important for the improvement of the didactics of the course?*

Not Important 1 2 3 4 5 Extremely important

○ ○ ○ ○ ○

How much do you think that the **PAPER questionnaire** is important for the improvement of the didactics of the course?*

Not Important 1 2 3 4 5 Extremely important

○ ○ ○ ○ ○

In general, how important do you think students' didactics evaluation is useful in order to improve the individual course and the entire degree?*

Useless 1 2 3 4 5 Indispensable

○ ○ ○ ○ ○

Figure 3: Three questions included in section 1 of the questionnaire.

The second section regarded how students perceived the importance of courses offered, aggregated by topics and including two questions with multiple choices. The grid (see Figure 4) allows students to answer two questions for each course topic – perception is always referred to as student's perception:

- Perceived importance for future employment: how much do you think that the respective course topic provides important skills for the future?
- Perceived relevance by students given to course topic: about the following topics, how much importance do you think is given to them in your study programme?

Possible answers are numeric and go from 1 «very low or not important» to 5 «highly addressed». An extra option “6” is «I don’t know/I don’t express myself».

	1	2	3	4	5	6
SILVICULTURE - FOREST MANAGEMENT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GIS - LIDAR - REMOTE SENSING AND INFORMATION SYSTEMS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FLUVIOMORPHOLOGY AND RIVER RESTORATION - HYDROLOGY AND WATERSHED MANAGEMENT - HYDROGEOLOGICAL RISK PROTECTION	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FUNGAL ECOLOGY - FOREST PATHOLOGY AND WOOD ALTERATIONS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
URBAN FORESTRY - ECOLOGICAL COUNTRYSIDE MANAGEMENT - NURSERY MANAGEMENT OF ORNAMENTAL PLANTS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FOREST OPERATIONS - LOGISTIC AND FOREST ROAD NETWORK	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 4: Grid for the two questions related to the course topics in section 2 of the questionnaire – values from 1 to 6 allow student to provide feedback on the question. See also text.

The course topics were listed by the students who prepared the questionnaire. It is obviously a subjective grouping of courses, with a limited number of classes to avoid an overly complex and long list.

The online questionnaire was promoted by the website of the Department of Land, Environment, Agriculture and Forestry (Territorio e Sistemi Agro Forestali – TESAF), through the official page of the Forestry Student’s Association (Associazione Universitaria Studenti Forestali - AUSF) of Padova and their mailing list. Therefore, this must be considered a poll on the forestry-related courses of University of Padova.

Results and discussion

A total of 76 students answered the questionnaire. The distribution per programme was not homogenous as can be seen from Figure 5 and Table 1. Of course, this depends on the overall number of participants in a study programme.

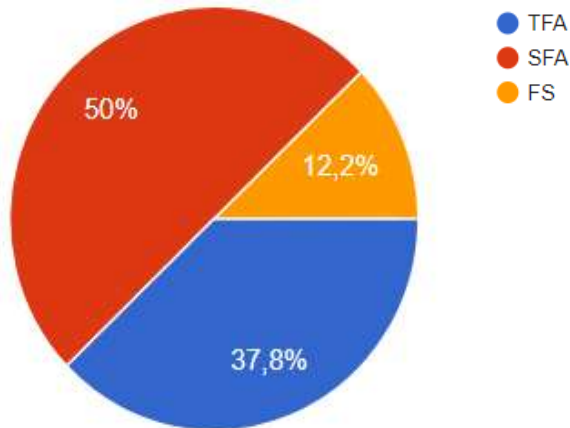


Figure 5: Distribution of students over the study programmes, answering the questionnaire – acronyms of study programmes are from Table 1.

Section 1 was evaluating the perception of the students regarding the online and paper feedback form for single courses. At the University of Padova, the online questionnaire on course perceived quality is filled in after the course, which is mandatory in order to register for an exam. The student cannot register a mark for an exam without having completed the online questionnaire. The paper questionnaire, on the other hand, is not mandatory, but often given towards the middle of the course to generate feedback from students. Results from paper questionnaires allow teachers to make changes if the students provide negative feedback on comprehension or other comments that are useful to improvement of the course. Figure 6 and Table 2 show results on how the students perceive the importance of the two types of questionnaires, online and paper, and their perception on overall importance given to their feedback, i.e. “does my feedback make a difference?”. The plot visually shows that, if a value of three is considered “average” in the sense as student saying “unsure if it is important or not”, all students regard both types of questionnaires important (above three), even if more confidence shows for the online one and the overall value. No significant difference is evident between study programmes or questionnaire types. A further analysis can be done by evaluating the standard deviation, which is evident, thus showing that not all students perceive the same way about the effectiveness of completing the questionnaire.

Table 2: Average and standard deviation (in brackets) of responses to section 1 questions grouped by question and study programme.

	Importance of ONLINE questionnaire	Importance of PAPER questionnaire	General perceived importance of evaluation method for students
FS	3.88 (0.99)	4.13 (0.35)	4.75 (0.46)
SFA	3.62 (0.91)	3.54 (1.12)	4.00 (1.05)
TFA	3.97 (0.91)	3.52 (1.12)	3.83 (1.14)

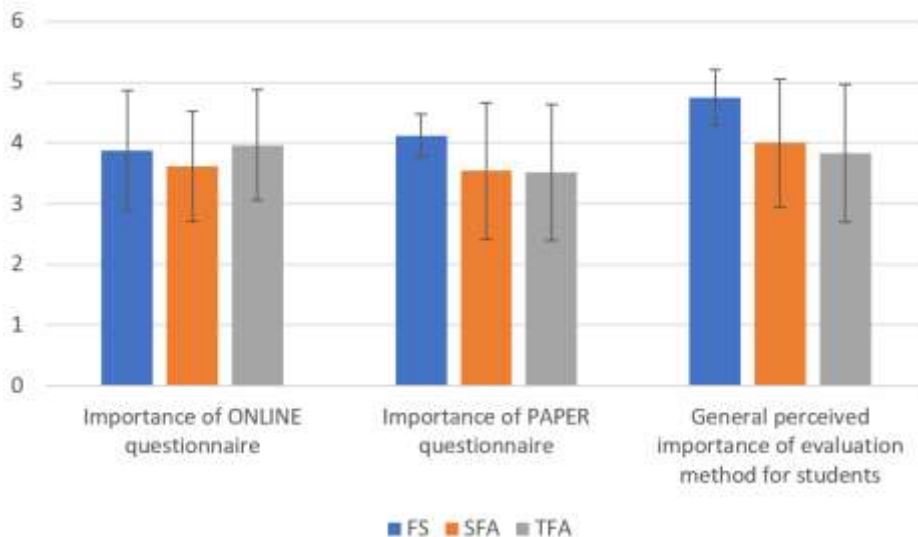


Figure 6: Results of section 1 questions, average and standard deviation. Numeric answers were from 1 to 5 (0 not included).

Results are shown in the following two tables, regarding how students perceive two aspects of the topic of courses that are offered in the study programmes, i.e. (i) the importance they feel a course has for their future activities in the forestry sector and (ii) how much they feel that a certain course topic is given relevance in their study programmes. **Fout! Verwijzingsbron niet gevonden.** shows how a certain course topic is perceived as being important by students. Course topics are ranked from most to least important course topic. Of course, it is evident that students only see part of the picture, and prefer practical courses, where they can perceive the application in practice. A consideration worth remarking is that ranking means that courses are ordered in terms of relative importance, and courses that are at the bottom are not necessarily perceived as not important, but less important than the ones ranked higher. This is trivial but must be highlighted to avoid misinterpretation. An interesting point is that the students in the Bachelor study programme (TFA), perceive English language courses and basic courses as less important. An explanation for English courses being ranked less important by students in the Bachelor programme can be that many of them do not consider working abroad thus consider learning English as a useless endeavour. This might reflect the mentality of some students, having mostly a local perspective only, and might be solved by increasing internationalization efforts, to increase awareness of importance of an international network for finding job offers and future employment opportunities. Regarding basic courses, it is a known phenomenon that students tend to enjoy more following courses that are more directly related to the topic of their chosen study programme (forestry) and do not perceive so much the importance of courses like Mathematics, Biology, Physics and other basic courses. The standard deviation of results in both English and basic subjects show that there is high variance in opinions, which is obviously due to students planning not to continue to a Master degree.

Fout! Verwijzingsbron niet gevonden. on the contrary shows how students think that the course topic is given importance in their study programme. Again, it is trivial to note that we

are talking about perception from the point of view of the student, who did not yet complete his or her studies, but very important to assess which actions can be undertaken to respond. It is interesting to note that the overall distribution of averages is shifted to lower values compared to those of **Fout! Verwijzingsbron niet gevonden..** This is also clear in Figure 5, where points are plotted in 2D space and are clearly below the oblique line with slope=1. It might be interpreted as students wanting all courses to be given more relevance. Another interpretation is that the average of importance is around 4, whereas the average perceived relevance is around 3, and the former with much less variance than the latter. This can be interpreted as a positive perception that course topics are all considered important, but that not all are covered with enough emphasis in the study programmes.

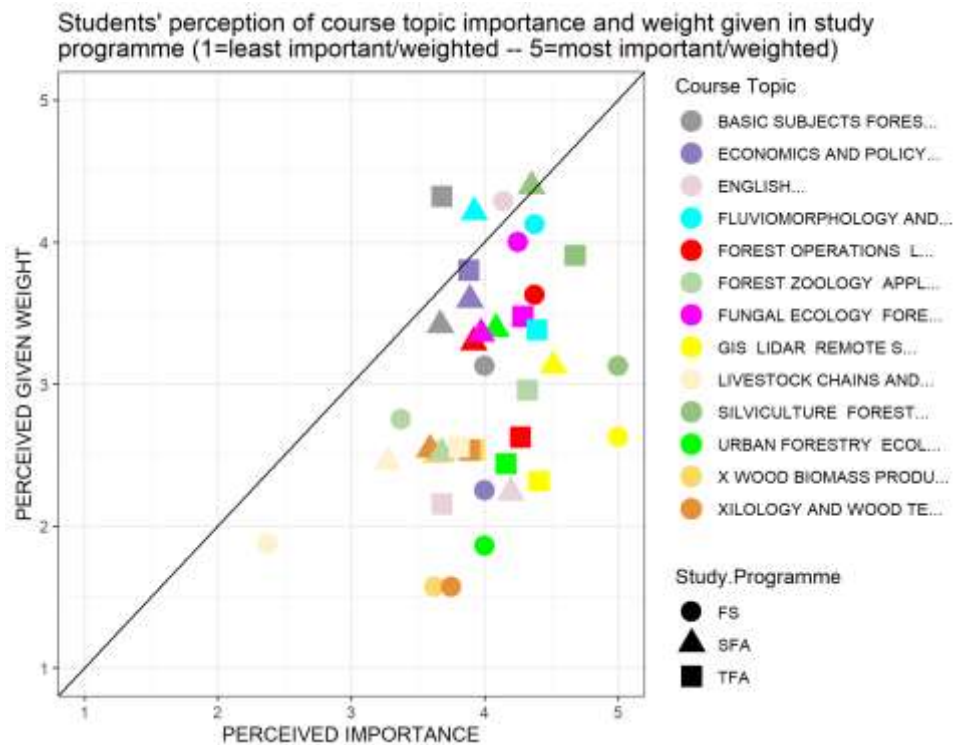


Figure 7: Two aspects of how students perceive course topics plotted to understand the unbalance between perceived importance of course topic and perception of how much the course topic is weighted in the three study programmes: X-axis = perceived importance of course topic, Y-axis = perception of given weight in study programme.

If the values for each course in Table 3 and 4 are subtracted and normalized, it is easier to assess which course, from the point of view of the students, should be given more space in the study programme – see Figure 8. Perceived weight of course topic given in study programme, minus perceived importance of topic; if result is negative, it means that a student perceives that a course topic is weighted less in the study programme than should be. As pointed out in the previous paragraph, there is a shift to negative values because for almost all courses students feel that the importance is more than the weight. This is clear in

Table 1: Perceived importance of the students for course topic, average (standard deviation) ranked from highest to lowest for each study course.

FS		SFA		TFA	
Silviculture - forest management	5.00 (0.00)	Gis - lidar - remote sensing and information systems	4.51 (0.61)	Silviculture - forest management	4.68 (0.55)
Gis - lidar - remote sensing and information systems	5.00 (0.00)	Silviculture - forest management	4.35 (0.95)	Gis - lidar - remote sensing and information systems	4.41 (0.69)
Forest operations - logistic and forest road network	4.38 (0.92)	English	4.19 (0.86)	Fluviomorphology and river restoration - hydrology and watershed management - hydrogeological risk protection	4.39 (0.79)
Fluviomorphology and river restoration - hydrology and watershed management - hydrogeological risk protection	4.38 (0.74)	Urban forestry - ecological countryside management - nursery management of ornamental plants	4.08 (0.91)	Forest zoology - applied zoology - conservation and management of animal species	4.32 (0.77)
Fungal ecology - forest pathology and wood alterations	4.25 (1.04)	Fungal ecology - forest pathology and wood alterations	3.97 (1.00)	Fungal ecology - forest pathology and wood alterations	4.29 (0.90)
English	4.14 (0.90)	Forest operations - logistic and forest road network	3.92 (1.00)	Forest operations - logistic and forest road network	4.27 (0.72)
Urban forestry - ecological countryside management - nursery management of ornamental plants	4.00 (1.20)	Fluviomorphology and river restoration - hydrology and watershed management - hydrogeological risk protection	3.92 (0.97)	Urban forestry - ecological countryside management - nursery management of ornamental plants	4.16 (0.85)
Basic subjects (forest plant taxonomy, ecology, biology and chemistry)	4.00 (1.20)	Economics and policy of forest resources - environmental appraisal - forestry and environmental law	3.89 (1.01)	Wood biomass production for energy use	3.92 (1.13)
Economics and policy of forest resources - environmental appraisal - forestry and environmental law	4.00 (0.76)	Forest zoology - applied zoology - conservation and management of animal species	3.68 (1.27)	Economics and policy of forest resources - environmental appraisal - forestry and environmental law	3.88 (1.09)
Xilology and wood technology - wood products technology	3.75 (0.71)	Basic subjects (forest plant taxonomy, ecology, biology and chemistry)	3.67 (1.17)	Xilology and wood technology - wood products technology	3.88 (0.95)

Wood biomass production for energy use	3.63 (1.19)	Wood biomass production for energy use	3.64 (0.99)	Livestock chains and products quality - mountain agriculture	3.81 (1.10)
Forest zoology - applied zoology - conservation and management of animal species	3.38 (1.30)	Xilology and wood technology - wood products technology	3.59 (1.05)	Basic subjects (forest plant taxonomy, ecology, biology and chemistry)	3.68 (1.47)
Livestock chains and products quality - mountain agriculture	2.38 (0.74)	Livestock chains and products quality - mountain agriculture	3.27 (1.07)	English	3.68 (1.28)

Table 2: How much students think the course topic is given importance and weight in his/her study course, average (standard deviation) ranked from highest to lowest for each study course.

Fs		Sfa		Tfa	
English	4.29 (1.50)	Silviculture - forest management	4.39 (0.68)	Basic subjects (forest plant taxonomy, ecology, biology and chemistry)	4.32 (0.90)
Fluviomorphology and river restoration - hydrology and watershed management - hydrogeological risk protection	4.13 (0.83)	Fluviomorphology and river restoration - hydrology and watershed management - hydrogeological risk protection	4.21 (0.70)	Silviculture - forest management	3.90 (1.14)
Fungal ecology - forest pathology and wood alterations	4.00 (0.53)	Economics and policy of forest resources - environmental appraisal - forestry and environmental law	3.59 (0.91)	Economics and policy of forest resources - environmental appraisal - forestry and environmental law	3.80 (1.01)

Forest operations - logistic and forest road network	3.63 (0.74)	Basic subjects (forest plant taxonomy, ecology, biology and chemistry)	3.42 (1.16)	Fungal ecology - forest pathology and wood alterations	3.47 (1.22)
Basic subjects (forest plant taxonomy, ecology, biology and chemistry)	3.13 (1.46)	Urban forestry - ecological countryside management - nursery management of ornamental plants	3.39 (1.20)	Fluviomorphology and river restoration - hydrology and watershed management - hydrogeological risk protection	3.38 (1.20)
Silviculture - forest management	3.13 (0.83)	Fungal ecology - forest pathology and wood alterations	3.35 (0.95)	Forest zoology - applied zoology - conservation and management of animal species	2.96 (1.22)
Forest zoology - applied zoology - conservation and management of animal species	2.75 (0.46)	Forest operations - logistic and forest road network	3.29 (1.22)	Forest operations - logistic and forest road network	2.63 (1.15)
Gis - lidar - remote sensing and information systems	2.63 (1.30)	Gis - lidar - remote sensing and information systems	3.13 (1.14)	Livestock chains and products quality - mountain agriculture	2.56 (1.29)
Economics and policy of forest resources - environmental appraisal - forestry and environmental law	2.25 (1.28)	Xilology and wood technology - wood products technology	2.54 (1.30)	Wood biomass production for energy use	2.53 (1.06)
Livestock chains and products quality - mountain agriculture	1.88 (0.99)	Forest zoology - applied zoology - conservation and management of animal species	2.52 (1.35)	Xilology and wood technology - wood products technology	2.53 (0.92)
Urban forestry - ecological countryside management - nursery management of ornamental plants	1.86 (1.21)	Wood biomass production for energy use	2.50 (1.14)	Urban forestry - ecological countryside management - nursery management of ornamental plants	2.44 (0.89)
Wood biomass production for energy use	1.57 (1.13)	Livestock chains and products quality - mountain agriculture	2.45 (1.37)	Gis - lidar - remote sensing and information systems	2.32 (1.25)
Xilology and wood technology - wood products technology	1.57 (1.13)	English	2.24 (1.36)	English	2.15 (1.16)

Figure 8, with most bars on the negative side of the Y-axis. The error bars are calculated as the square root of sum of the two standard deviations, as required for correct error propagation calculations. The size of the error bars shows how inhomogeneous the answers were, showing that all study programmes have a (high) diversity in terms of opinions from the students' side.

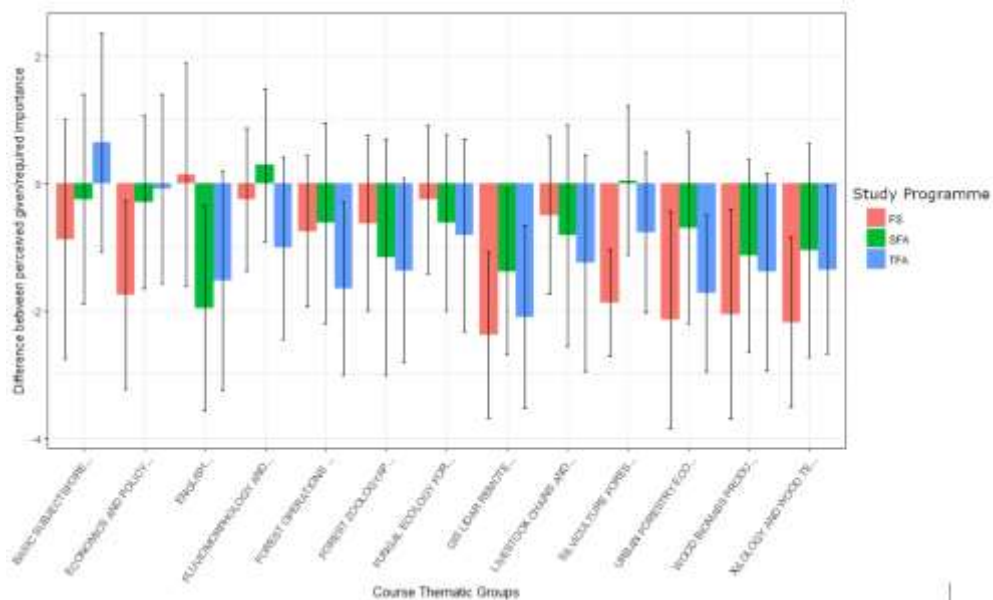


Figure 8: Difference between importance and weight as perceived by students. Negative values mean that the course is considered important, but not enough weighted (e.g. in terms of hours of lectures) in the study programme.

Conclusions

The data collected by the forestry students' association (AUSF) allowed to get a better understanding of the student's perspective regarding their engagement in quality assessment of single courses and how students perceive importance of course topics. Results show that students think that their feedback through the online and paper feedback forms is important, even if their perception of the overall importance is greater than the perceived importance of the single methods used (paper and online feedback form). Regarding the importance of course topics, the responses have a high variance, showing that opinions are not homogeneous. This can be interpreted as study programmes providing a good mixture of topics, even if students do feel that some topics are more important than others and that to their opinion they should be given more weight in the study programme. Another possible explanation is that it is student's perception that underestimates basic preparatory courses in favour of skills which are more attractive because the link between them and their intended future activities is more immediate. A last conclusion can be addressed here saying that

open cooperation between student representatives and academia involved in teaching is of foremost importance to address gaps in the course offering of a study programme.

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THE ROLE OF INTERNATIONALISATION IN IMPROVING THE QUALITY OF DEGREE PROGRAMMES

SUSANNE KLÖHN

Abstract

The internationalisation of the higher education institutes id of raising importance. The University of Padua recognises this and stimulates teaching in English, joint and double degree programmes and participates in XXXX of them. The number of mobility students increases and apparently these students obtain more ECTS credits and finish their study programme in shorter time. Their employability is better.

Keywords: student mobility, forest science education, quality of study programmes.

Introduction

With the implementation of the Bologna Process, the internationalisation of the higher education institutions has been of raising importance. Internationalisation takes place directly at the universities with increasing international awareness and the development of new curricula or it is related to the physical mobility of students and staff. The main responsibility for concrete activities lies in the hands of the universities themselves and leads to individual policies and strategies in each institution (EACEA, 2018). Increasing mobility can enhance employability of students. That was recognized by the European Commission within the 2020 strategy, setting the target that at least 20% of students should spend a period at another university inland or abroad within their universities carrier (EC, 2010).

Internationalisation and quality assurance are among the key policy issues at the University of Padova (UP). The universities policy aims at the creation of an international academic environment where student mobility –incoming and outgoing –goes hand in hand with the presence of teachers from foreign universities. To stimulate this, UP among other measures, promotes the increase of courses held in English, the creation of joint programmes and double-degree curricula to increase the number of students seeking an international degree who are enrolled in the UP Bachelor, Master and PhD programmes⁵.

According to the national funding criteria, internationalisation becomes an important indicator for the performance of Italian universities in evaluations by the National Agency for the Evaluation of Universities and Research Institutes (ANVUR) (MIUR, 2016). The Italian Quality Assurance and Accreditation System ‘AVA’ for universities and degree programmes includes specifically the following indicators⁶:

⁵ <https://www.unipd.it/linee-strategiche-2016-2020>

⁶ <https://www.anvur.it/attivita/ava/indicatori-di-monitoraggio-autovalutazione-e-valutazione-periodica/>

- Percentage of ECTS credits acquired in a foreign country by students regularly enrolled in the frame of the normal duration of the degree programme
- Percentage of students graduated within the normal duration of the programme (Bachelor, Master, single cycle degrees), who acquired at least 12 ECTS credits in a foreign country
- Percentage of students enrolled at the first year in a Bachelor, Master or Single-cycle-degree who completed their previous studies in a foreign country
- The University of Padova pays also particular attention to international rankings⁷, like the Times Higher Education World University Ranking (THE) where the international outlook is one area of indicators⁸.

This article reflects on forestry education and the contribution to the internationalisation process at the University of Padova and the impact of internationalisation on the quality of education.

University of Padua,

The University of Padova is a university with almost 60.000 students. It is subdivided into 32 departments. The departments are in charge of research and education as well as the knowledge transfer to the region. In order to organize the didactic activities more efficiently, the departments are united in eight different schools. Forestry education takes place at the School of Agricultural Science and Veterinary Medicine. Currently 22 degree programmes are taught in English and the university participates in 20 double-degree consortia. The university takes part in Erasmus Mundus Joint Master degrees (EMJMD), many of them already in their third or fourth edition, like the study programmes in forestry. Other double degrees with one or more European partners exist, like for example the T.I.M.E. project (Top Industrial Managers for Europe) or double degrees with non-European partners, like the Master degree in Crop and Soil in collaboration with the University of Georgia (USA).

School of Agricultural Science and Veterinary Medicine

The School of Agricultural Science and Veterinary Medicine caters for around 3900 students currently enrolled. Internationalization has been implemented very actively: the school offers 20 Bachelor and Master degree programmes, five of which taught entirely in English, being part of six double degrees. The first Master degree programme entirely taught in English was the MSc in Forest Sciences, starting in the academic year 2014/2015. Before that, the courses in English have been part of a curriculum within the Master degree in Forest and Environmental Sciences taught in Italian. Other Master degree programmes taught in English are the MSc in Sustainable Agriculture, MSc in Italian Food and Wine, MSc in Biotechnology for Food and a Bachelor degree programme in Animal Care.

The Master Degree in Forest Science participates in three Erasmus Mundus Joint Master Degrees (EMJMD) funded by the European Commission namely SUTROFOR,

⁷ <https://www.unipd.it/en/ranking-evaluation>

⁸ <https://www.timeshighereducation.com/>

SUFONAMA and MEDfOR, respectively on management of tropical, European and Mediterranean forests. All EMJMD lead to double or multiple degrees, no joint degree is awarded yet. The programme TRANSFOR-M leads to a double degree with one of the participating universities in Canada.

The Master degree programme in English holds not just replicas of the courses taught in Italian; it has a clear and distinctive mission. The courses are, in fact, often more interdisciplinary with an international perspective and a higher amount of credits granted to students for the development of soft skills. Furthermore, new teaching methods have been successfully implemented, like course units offered completely as e-learning with the synchronized participation of students from partner universities.

Beside the Master degree programme Forest Science in English at the School of Agricultural Sciences and Veterinary Medicine there exist a Bachelor degree programme in Forest and Environmental Technology and the successive Master degree programme in Forest and Environmental Science taught in Italian. Internationalisation in those programmes takes place most of all in terms of incoming and outgoing student mobility, mostly within partner institutions in the frame of the Erasmus+ programme inside Europe.

Quality assurance

Quality assurance in the Erasmus+ programme is well defined and conducted on various levels and follows the indications of the Erasmus+ Programme Guide of the European Commission (EC, 2018). The Erasmus Charter for Higher Education (ECHE) sets the general quality framework for cooperation activities within the Erasmus+ programme. This is a prerequisite for institutions in partner countries for their participation in mobility projects⁹. The bilateral agreement, which has to be established before starting the exchange of individuals, defines the details of cooperation between higher education institutions. The Learning Agreement defines the individual study or traineeship project and assures the recognition for each study abroad, while the Erasmus Student Charter describes the rights and obligations of the students.

The number of forestry students participating in student exchange is continuously increasing (Figure 1).

⁹ https://ec.europa.eu/programmes/erasmus-plus/sites/erasmusplus2/files/files/resources/he-charter_en.pdf

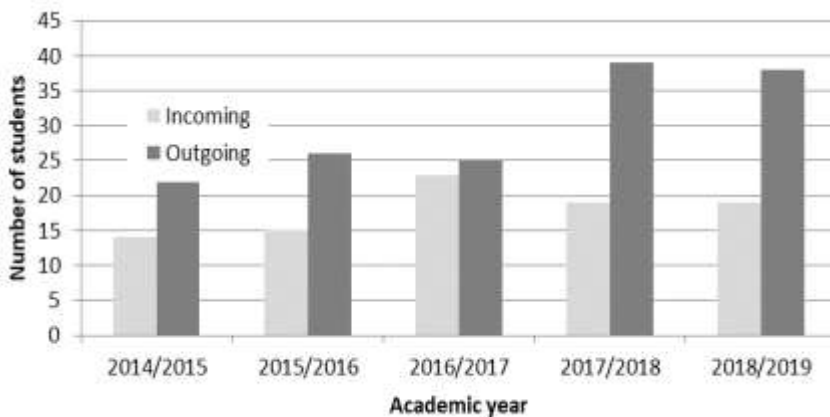


Figure 1: Number of students in mobility (forestry related studies), at the University of Padua.

Nevertheless, a negative attitude, which envisions the Erasmus exchange semester as a mere fun or recreational moment, thus a loss of time, still exists. This was indicated by the results of an internal survey carried out by the University of Padova after the Call for Erasmus+ for Studies for the academic year 2018/2019 between students of all disciplines. When asked why students did not apply for an exchange period, 26 % of the respondents declared that they were afraid to delay their graduation. Other students cited the lack of funding (17 %) or their insufficient language preparation (15%). Therefore, many exchange places remain free. Hence, the University makes efforts in order to increase the number of outgoing students.

Mobility takes place mainly during the Master studies (Table 1). Only 5 % of the Bachelor students in Forest and Environmental Technology used the possibility for studying abroad, but once at the foreign university, they are staying for a longer period and thus acquire more credits than Master students abroad. Meanwhile 18 % of the Master students in Forest and Environmental Science included a mobility period into their student carriers.

Of the Forest Science students, 27 % are engaged in mobility in exchange programmes, which is a higher percentage than in other study programmes. If we add to that number the students who are enrolled in double degree programmes, 46 % of the students have conducted part of their studies in a foreign country.

Comparing the credits acquired per semester, students in mobility gain more credits in one semester than the classmates staying home. Considering, that only around 60 % of the students take their degree within the regular duration of the Master programme in Forestry and Environmental Sciences (Gatto *et al.*, 2018), student mobility should also contribute to graduating in less time.

In order to encourage students to take the opportunity to study abroad, the degree programmes included into their regulations the possibility to get one extra point (ECTS credit) for their thesis evaluation. The minimum requirements for this extra point are three months of mobility and at least ten credits acquired in a foreign country for the Bachelor Degree and 15 for the Master Degree. Thus, students can increase their graduation grade thanks to a study period abroad.

Table 1: Students of forestry related studies at the University of Padua in mobility 2016/2017)

Degree course	Number of students	Students in mobility			Students staying at home university
		(%)*	Average Mobility period (months)	ECTS credits per semester	ECTS credits per Semester
Bachelor in Forestry and Environmental Technology (in Italian)	394	5	5,7	35,1	18,1
Master in Forestry and Environmental Science (in Italian)	192	18	5,3	28,3	18,8
Master in Forest Science (in English)	48	27	4,6	24,9	21,8

*Exchange mobility in the frame of the Erasmus+ for study programmes (no traineeship) and bilateral agreements.

The statistics show also, that the number of credits acquired in one semester by students enrolled in the Master degree in Forest Science is higher than the credits acquired by the students enrolled and the equivalent Master degree taught in Italian. This should lead also to a graduation without delays within the normal duration of the programme of two years. One reason for that might be the high number of scholarship holders enrolled as double degree students, who are depending on the financial support for their self-subsistence and must finish in time. Unfortunately, reliable statistics on this are not yet available.

An international experience during the education has an impact on the employability of students. The Erasmus+ Higher Education Impact Study (EU, 2019) shows that 79 % of the graduated students with an Erasmus+ experience get their first job in less than three months. Moreover, 67 % of the graduates of the Master degree programme in Forestry and Environmental Science are employed after one year from graduation (Gatto *et al.*, 2018). No specific data are available yet about the difference between students with an mobility experience or students that are enrolled in the Master degree of Forest Science.

Conclusion

The role of internationalisation for enhancing quality of higher education has been recognized and enforced within the European Higher Education Area, especially during the last decade. Universities in Italy are required to internationalise in order to receive funding. The quality of education of universities and degree programmes can benefit from internationalisation due to the indicators that are taking into account the ECTS credits gained abroad or the number of international students enrolled, but both can benefit also due to a shorter duration of studies and a higher employment rate.

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CONCLUDING REMARKS AND POSTFACE

NORBERT WEBER

During the 2018 Annual Conference of SILVA Network, different views on quality management and accreditation were provided by representatives of stakeholder groups involved in forest sciences education and related disciplines. A lot of formal aspects were addressed in the contributions, especially the implementation of European Union legal acts regarding accreditation in a multi-level context in nation states, universities and study programmes. However, it became obvious that informal aspects sometimes are even more important. That is why teaching values, culture of quality, feedback culture, fairness and trust were mentioned as necessary conditions to achieve far-reaching and permanent improvements. Quality improvements are even more challenging, as expectations about quality differ between major stakeholder groups, e.g. students, professors, administrators and employers. Moreover, it seems that the paradigm change from teaching to learning is not being represented in many lists of accreditation criteria.

Nearly every university offering education in forest sciences and related disciplines is applying evaluations, even though in different forms with regard to levels, actors, timespan and techniques. However, a kind of “evaluation of evaluations” (cf. Pirotti et al., this volume) should be conducted from time to time to find out if the established instruments are still adequate.

As a typical element of SILVA Network conferences, in addition to oral contributions of presenters, more interactive formats were offered as well. Participants of Roundtable 1 joined along the provocative headline „Bureaucracy: a necessary evil in teaching?” They came to the conclusion that bureaucratic processes for organization of teaching and learning, although often not very comfortable, have important purposes, e.g. they are helpful in preparing audits. If certain procedures are criticized, sometimes it is more a matter of perception or communication than the process itself. However, as the effort for bureaucratic documentation is growing, the question of expectable benefits and impact becomes more and more important. Besides, technical aspects should be better considered e.g. to avoid unnecessary double efforts.

Roundtable 2 worked on a “Draft communiqué on quality assurance and accreditation”. Although the communiqué could not be finalized, within the discussion several aspects were identified as pivotal to quality assurance and accreditation. First and foremost, it has been a basic concern of SILVA Network to improve quality of teaching to assure that graduates are equipped with the required competences. To achieve this aim, a lot of instruments are already available: quality assessment and quality assurance, accreditation, internationalization (e.g. within international learning groups that are “opening minds” of students), permanent

quality dialogues on all levels (course, study programme, university). More recent forms, e.g. peer review of teaching, peer visits of lectures, e-learning, should be considered as well. However, some serious constraints should not be neglected. For instance, acceptance by all stakeholders (lecturers, students, employers, administration) is crucial. In a similar vein, as was mentioned by one of the participants, “trust” is key.

Roundtable 3 discussed about The European dimension: strengths and limitations of joint efforts for securing teaching quality. – It concluded with the finding that there have been a lot of successful initiatives on European level to improve quality of forest study programmes during recent decades. Experiences and teaching resources have been shared, associated partners have been involved, summer schools have been established and other forms of mobility have been encouraged. However, when it comes to European voluntary initiatives like SILVA Network, sustainability of funding is still an unresolved issue.

When the conference was held in 2018, nobody could expect the impacts of the Covid-19 pandemic on academic teaching in forestry. Major shifts in “digitalization” are observable now on a worldwide scale, covering all steps in processes of teaching and learning from selection of courses to forms of evaluation. At the end of 2020, e-learning and distance learning, being a kind of experimental field for a smaller number of lecturers before Covid-19, are the dominating form how students meet their lecturers. It will be the task of the SILVA Annual Conference 2021 to assess the consequences of these developments.

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PROCEEDINGS OF THE SILVA NETWORK CONFERENCES

See also www.silva-network.eu

Year	Location	Title	Editors	Published in, as
1997	Wageningen, Netherlands	New requirements for university education in forestry	Schmidt, P., Huss, J., Lewark, S., Pettenella, D. & Saastamoinen, O.	1998, DEMETER SERIES 1
1998	Joensuu, Finland	Forestry in changing societies in Europe. Information for teaching module. Part I and Part II.	Pelkonen, P., Pitkänen, A., Schmidt, P., Oesten, G., Piussi, P. & Rojas, E.	1999, SILVA Network
2002	Warsaw, Poland	ITC in higher forestry education in Europe	Tahvanainen, L. & Pelkonen, P.	2004, SILVA Network Publications 1
2003	Beauvais, France			
2004	Freising, Germany	Quality and competence in higher forestry education	Tahvanainen L., Pelkonen, P. & Mola, B.	2004, SILVA Network Publications 2
2005	Wageningen, Netherlands	Forestry education between science and practice.	Schmidt, P. & Bartelink, H.H.	2006, SILVA Network Publications 3
2006	Valencia, Spain	Quality assurance and curriculum development in forestry and related sciences.	Schmidt, P., Rojas-Briales, E., Pelkonen, P. & Villa, A.	2007, SILVA Network Publications 4
2007	Freiburg im Breisgau, Germany	Design and functioning of international forestry curricula: considerations and experiences	Schmidt, P. & Lewark, S.	2008, SILVA Network Publications 5

Year	Location	Title	Editors	Published in, as
2008	Copenhagen, Denmark	What do we know about our graduates? Graduate analysis for forest sciences and related curricula	Schmidt, P. Lewark, S. & Strange, N.	2010, SILVA Network Publications 6
2009	Thessaloniki, Greece	Development of forest sciences curricula in Europe	Schmidt, P. Lewark, S. & Aravanopoulos, F.A.	2013 SILVA Network Publications 7
2010	Zagreb, Croatia	Bachelor / master education in forest sciences – Ready for the next decade?	Schmidt, P., Susnjar, M. Müller-Starck, G. & Lewark, S	2013, SILVA Network Publications 8
2011	Saint Petersburg, Russia	Bologna cycles 1 to 3 in higher forestry education – Objectives and reality	Schmidt, P., Müller-Starck, G., Chubinsky, A. & Lewark, S.	2014, SILVA Network Publications 9
2012	Lleida, Spain	Do students learn what they will need later? About expected learning outcomes and competences of graduates	Schmidt, P., Vega-Garcia, C., Müller-Starck, G. & Lewark, S.	2014, SILVA Network Publications 10
2013	Istanbul, Turkey	From teaching to learning – When will we take it seriously in forest sciences education?	Schmidt, P. & Lewark, S.	2015, SILVA Network Publications 11
2014	Zollikofen, Switzerland	Practice orientation in forestry curricula in universities and universities of applied sciences	Schmidt, P., Lewark, S., Müller-Starck, G. & Ziesak, M.	2016, SILVA Network Publications 12

2015	Vienna, Austria	Should all forestry students learn the same? Generalist or specialist approaches	Schmidt, P., Hasenauer, H. & Lewark, S.	2016, SILVA Network Publications 13
2016	Tartu, Estonia	Forest science education: Self-study and activation of the learner	Schmidt, P., Lewark, S. & Reisner, V.	2017, SILVA Network Publications 14
2017	Prague, Czech Republic	Forest for university education: Examples and experiences	Schmidt, P., Lewark, S., Remeš, J. & Weber, N.	2018, SILVA Network Publications 15
2018	Padua, Italy	Quality management and accreditation for study programmes in forest sciences and related disciplines	Schmidt, P. Lewark, S. Pirotti, F. & Weber, N.	2020, SILVA Network Publications 16