

FROM TEACHING TO LEARNING –  
WHEN WILL WE TAKE IT SERIOUSLY  
IN FOREST SCIENCES EDUCATION?

Proceedings of the SILVA Network Conference  
held at Faculty of Forestry at the Istanbul University,  
Istanbul, Turkey, November 1<sup>st</sup> – November 3<sup>rd</sup> 2013



SILVA Publications 11  
2015

Editors

P. Schmidt and S. Lewark

With the collaboration of Y. Serengil, G. Müller-Starck P.  
Paschalis-Jakubowicz, M. Rekola, C. Vega-Garcia and M. Ziesak

This book is published at the  
University of Freiburg  
Freiburg im Breisgau  
Germany

Keywords: Forest sciences education, Learning Paradigm, teaching to teach,  
Bologna process, relation to labour market, life-long-learning, mobility,  
forestry education in Turkey.

ISBN 978-3-00-049893-0

## **PREFACE I**

It is a mathematic law: after ten comes eleven. The book in front of you is the SILVA Network Publications 11, together with the previous ten a library full of forest sciences education.

This 2013 annual conference was co-organised by SILVA Network, IUFRO Task Force “Education in Forest Sciences” (EFS) and the Forestry Faculty of the Istanbul University in Turkey, each with its own speciality and its own knowledge.

The IUFRO EFS indicates IUFRO’s interest in education and as such is a natural partner of the SILVA Network. The funding by IUFRO EFS of the participation of members of the International Forestry Students Association (IFSA) is thankfully mentioned here.

The Forestry Faculty of the Istanbul University in Turkey hosted this annual conference. This faculty – itself more than hundred years old – is a young but enthusiastic member of the SILVA Network, which fulfilled – during the preparation and during the meeting – its tasks as a host and organizer in a most elegant way. Of course, a short overview of Turkish forestry was included, both through the excursion in the Asiatic part of Turkey (together with participants of the preceding Conference of Deans and Directors of European Forestry Faculties and Schools [ConDDEFFS]) and in a paper presented during the meeting and published in this volume.

This brings us to the most important participants, the speakers who turned into authors after the conference. Thanks to their creativity and energy and time input this volume came into existence. Quite often the reader can feel in the text the engagement of the author(s) for forestry and forest science education.

A much smaller group of teachers was involved in the quality assurance of this book. Six colleagues reviewed the submitted papers and made suggestions for improvements. Without them, the two editors could not have done their work.

We, the editors, would like to say thanks to these three groups of persons: the organisers, the speakers/authors and the reviewers. Without them, this book would not exist.

Pieter Schmidt and Siegfried Lewark  
The editors

## PREFACE II

I have started my academic career as a lecturer at the Faculty of Forestry of Istanbul University more than three decades ago. Some of my former students hold high level positions in the forestry sector. I believe that the years spent at university have a significant influence on the professional career of a forester. Therefore, instead of teaching focused only on theoretical knowledge, we must improve their capacities and skills and teach methods to solve actual forestry based problems.

Of course, the present day teaching objectives are not the same as they were earlier and those earlier objectives are of no concern for some of the lecturers now.

I remember very respected professors in our faculty. And they could not have been much more beneficial for the students. The things that I would like to underline are the attitudes of lecturers toward the students. The teaching methods should be appreciated by the students and should be seen with the eyes of the students, not with those of the lecturers, because they are to be considered as the outcomes and fruits of our education.

We know that the capabilities of machines in a factory do not mean anything unless the products are of high quality. Keeping this point in mind is what we try to do, launching a student focused education programme. But there are challenges we have to deal with. One of the most significant challenges is the resistance to change by the lecturers. Higher education is very active and innovative in many fields of medicine, economics and industrial sciences, but forestry is not one of them. In my view, forestry is a conservative field compared with many others. The major reason of this is the high influence and share of the government in the sector and lack of competition among faculties. More private sector influence might force forestry education to change and improve faster.

Despite this fact we have made during the last five years many achievements in our faculty, although there are still ways to go. One of our objectives now is to increase our capabilities at the international level. With international collaboration in education and research we aim to provide more innovative, sophisticated and productive education programmes that will carry our forests and forestry sector to the highest level.

The SILVA Network Annual Meeting we organised in Istanbul was a step towards this objective. We hope to improve our collaboration in the frame of the Network and go on being one of the most active member institutions. In this respect I would like to thank all our friends in the SILVA Network and in particular Siegfried Lewark for his efforts.

Prof.Dr. Ahmet Yeşil  
Dean of Faculty of Forestry  
Istanbul University

## **PREFACE III**

The IUFRO Task Force “Education in Forest Sciences” (EFS) has a mandate from the IUFRO World Congress 2010 to that of 2014, to work for “improved practice of Education in Forest Sciences worldwide” as a cross-divisional IUFRO unit ([www.tf-efs.proste.pl/en](http://www.tf-efs.proste.pl/en)). Clearly EFS and SILVA Network have essential aims in common, with a different scope of time and a worldwide mandate of EFS as compared to the permanent European work focus of SILVA Network. The cooperation with EFS is a continuation of that with other - partly former - IUFRO groups, like the Education group and the Silvicultural education group.

EFS has acknowledged SILVA Network as a partner from the very beginning, at its kick-off meeting in Warsaw in February of 2011. SILVA Network has also been represented at the later meetings of EFS, not in the least because the SILVA Network president served as deputy co-ordinator of EFS – and EFS was present at the SILVA Network annual conferences. So co-organising of the SILVA Network annual conference as an EFS education conference in Istanbul was a welcomed opportunity for further co-operation, which also was expressed by funding of the participation of IFSA members. The topic of the conference in Istanbul is certainly of major interest also of EFS.

So now we are happy to write this address and thus underline the interest in co-operation of EFS and SILVA Network.

Piotr Paschalis-Jakubowicz and Siegfried Lewark  
Co-ordinator and Deputy co-ordinator IUFRO-EFS  
Warsaw and Freiburg



Participants of the SILVA Network conference in Istanbul in 2013 (photo Reiner Mühsiegl).

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## **SUMMARY**

### **FROM TEACHING TO LEARNING – WHEN WILL WE TAKE IT SERIOUSLY IN FOREST SCIENCE EDUCATION?**

**PIETER SCHMIDT**

In their thematic introduction, SIEGFRIED LEWARK and PIOTR PASCHALIS-JAKUBOWICZ state that the shift from teaching to learning – as implemented in the title of this conference – will lead to the question of “how” the competences wanted may be achieved. It will result in a shift from the Instruction Paradigm to the Learning Paradigm, which was discussed more or less hidden already quite a number of times during earlier SILVA Network conferences. During this conference we tried to find out, how far we already went in forest sciences education, and what we could do to make more progress. The presented texts, based on the presentations at the conference, may give some answers.

The Centre for Faculty Services (CFS) of the University of Lübeck has, according to BETTINA JANSEN-SCHULZ, developed an innovative approach of a higher education didactic programme for teachers. This programme includes 50 courses and leads to three different didactic certificates. Innovative aspects are the orientation towards the teaching competencies, not the deficits, and the freedom to choose which competencies to improve and which course to follow in about three years. The diversity concept in higher education is grounded in interdisciplinarity and inter- and transcultural settings, combined with the principles of integrative gendering (including aspects of gender and diversity in academics’ everyday teaching). One important result is that there is a noticeable increase in the demand for teaching certificates. This fact should, so Jansen-Schulz, be reflected and given more weight in appointments of professors.

In his contribution ACHIM DOHRENBUSCH invites readers to think about the necessity of the shift from teaching to learning for forestry education. On university level this shift has a large impact. This change means turning away from an input-management system which is based on contents, to an output-management system, which is focused on the so-called learning-outcomes. While the traditional system is mainly orientated at the presentation of teaching contents, the proposed new system regards the results of learning. On university level this shift is visible from the students’ workload and in a change of the teachers’ position.

Higher forestry education has traditionally a strong connection to the forest administration. There are clear demands of professional knowledge. Therefore, higher forestry education is not very well suited to realise the principal shift from teaching to learning. But even if it is generally accepted that the shift from teaching to learning could be a useful improvement in education and forestry education as

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well, these new methods will not solve the current problem that more and more young people with low prospect of success attend university.

To gain insight into individual perceptions of students and teachers during the introductory phase to the Bachelor programme “Forstwissenschaften” (Forest Sciences) at the Technische Universität Dresden, NORBERT WEBER and LIA STEFKE conducted a survey addressing students and lecturers attending this programme. The results point to differing expectations from the lecturers’ and students’ point of view. Amongst others, lecturers complain about missing competences in school subjects like English, biology or chemistry and a misfit between expectation and real development of the cognitive dimension. On the other hand, 41% of the students feel that they are not sufficiently or not at all prepared for the study programme. Students’ low motivation (but very motivated graduates evolve from these programmes) and heavy workloads in the new BSc programmes may be named here. Although a lot of proposals have been made to improve the situation, their realization would necessitate financial means and additional staff capacities.

In the framework of IFSA MAGDALENA LACKNER and MELANIE SCHULTE surveyed BSc forestry students at the Technische Universität München. It appeared that students have high expectations from both teachers and courses. On the other hand, the demands on students are high too. Moreover, the teaching system has to face changes in society and to adapt the courses. Furthermore, students want their voices to be heard in this changing process, next to the teachers. Of course, the voices of future employers have to be included in this discussion too.

In 2008 the Spanish Government established according to CRISTINA VEGA-GARCIA, FRANCISCA SANTIVERI, CARMEN IGLESIAS-RODRIGUEZ, LUIS SERRANO and JORGE ALCAZAR a new educational organisation of degrees, in Bachelor and Master-level programmes, aiming at the conformation to the EHEA in a convergence process initiated after the Bologna Declaration. A Royal Decree was followed by Legal Orders from the Ministry of Education establishing regulations to set competences to be acquired, or learning outcomes, and contents in study programmes with professional qualification.

When new study plans were approved at the Agrifood and Forestry Science and Engineering School of Lleida in 2009, special courses of integrated practice were formulated. The courses of six ECTS credits each are compulsory in the first, second and third year of the Bachelor programme, as part of the new focus on practical training in Forest Engineering.

These integrated practice courses were to be developed with substantial time in the field and they were devoted to: a basic regional environmental study (1st year), a watershed scale study (2nd year) and a forest management plan (3rd year). These practical courses were to take place after students completed all related topics, at the end of each academic year.

Expected learning outcomes of these project-based learning courses were ambitious and manifold, including some related to field work design and implementation, group work, inter-personal skills, oral communication and presentation skills, and capacity-building in the assessment and management of forest resources at different scales and for multiple-use forestry. The authors discuss here the limited experience available on the development and achievement of learning outcomes of these courses so far, as they embodied the main effort in the teaching-to-learning shift implicit in the Bologna process adopted in Lleida.

The Bologna Declaration induced the Bachelor and the Master degree and thus opened the door for a new dimension of student mobility. By choosing another university for their upcoming MSc curriculum, BSc students can easily supplement their education and gain more specific qualifications. In contrast to this, however, the student mobility within the BSc programmes still is inadequate. According to GERHARD MÜLLER-STARCK, MARTIN DÖLLERER and THOMAS SCHNEIDER the main problem here arises from the lacking acknowledgement of course achievements from abroad in spite of the fact that various European guidelines exist which are well designed to promote student mobility. European higher education institutions still seem to neglect the corresponding cooperation. Consequently, students who want to follow mobility recommendations of the European Commission risk an involuntary prolongation of their studies in case they want to spend a term abroad. The ERASMUS Programme tries to bridge such problems but this does not help all those students who cannot participate in this programme.

As an example, student mobility at the Technische Universität München, Germany, is checked with respect to curricula in the fields of forest science. Appropriate tools for the improvement of student mobility are structural modifications of the BSc curriculum, execution of learning agreements, verification of external course achievements by an authorised transcript of records, and more flexible recognition practices. Corresponding cooperation between higher education institutions needs to be improved in order to avoid prolongation of the BSc studies.

The idea of life-long learning is a quite prominent element in the Bologna process. Hence universities are requested to play an active role in implementation of life-long learning. MARTIN ZIESAK, PATRIC BÜRGLI and ROBERT LEHMANN give examples from the Swiss School of Agricultural, Forest and Food Sciences (HAFL). The presented cases are both “certificate education programmes”, which are meant exclusively for people who graduated some years ago and who are in an active employment relationship. The first example gives a brief overview for an agricultural life-long learning offer at HAFL, the second case describes a bit more in detail a forestry initiative. In general, these certificate education programmes are useful and attractive “vehicles” for universities to realise attractive life-long learning options for jobholders. Some key factors like structural success features, but also adapted learning and teaching types are described.

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Forestry as a profession in the Netherlands, so wrote SILVIA BLOK, GERRIT EPEMA and PIETER SCHMIDT, developed due to scientific and societal changes since the start around 1880 till now, 2014. These developments have been major drivers influencing the set-up of the forestry education at Wageningen University and its predecessors, next to changing ideas on academic education and national and EU education policy. To monitor these changes the Alumni Society (KLV) and Wageningen University have carried out job market research since 1973. One of the main motives of monitoring the job market's positions is to implement the results in education. Here, the main trends in forestry education are presented together with the outcome of the surveys of forestry graduates. Special emphasis is given to the present adaptations of the forestry programme and the role of alumni investigations in the process. It turned out, that the flexibility of the programme makes it possible to prepare students better for the changing job market, while keeping the high academic standards, and without changing the programme drastically.

Education and working life are interlinked in many ways. MIKA REKOLA and EILA LAUTANEN measured the perceptions of employability and work-education match among forestry graduates in Finland. The focus related to employability was on working while studying and satisfaction with studies from the career point of view. Preliminary results from a survey (n=520) including academic foresters (MSc) and forest polytechnic engineers (BSc), graduated between the years 2000 and 2008, showed that working while studying had heterogeneous effects on the study length. Especially, according to the BSc students' perception, working improved learning and career prospects. Working while studying was also important for entering the labour market, since for the majority of the graduates the first job after graduation was the same as the one while studying. There was an overall satisfaction with education and its relationship to the labour market. From the point of view of quantitative matching the BSc graduates were under-educated and the MSc graduates over-educated. The BSc graduates' field of employment matched to a great extent with their education, whereas MSc graduates' match was much lower.

JIRÍ REMEŠ describes the actual strategy of education in forestry sciences at the Faculty of Forestry and Wood Sciences (FFWS), Czech University of Life Sciences Prague. This new strategy in educational activities is based on developing three priorities – students, teachers and graduates. For each of them the main actual problems, goals and ways how to achieve them are described. A key challenge in this area is to increase students' motivation through changes in the approach by the teachers. University professors should move into the role of moderators, who ask questions and manage discussions with the aim to motivate students to think independently and to work with information. Also, new scholarship programmes, increasing the supply of foreign internships and attractive conditions for study can increase students' motivation. The last pillar of the new educational strategy are the graduates and their acceptance in practice. The newly established Council for cooperation with practice is expected to increase employment of graduates in future.

University-level forestry education in Estonia is organised on the basis of the Bologna 3+2 system. HARDI TULLUS and VAIKE REISNER state that all forestry curricula have been awarded “Full accreditation” by the Estonian Higher Education Accreditation Centre in 2012. Suggestions made by the accreditation team in November 2006 suggested that the Master programmes should be made available for European applicants without proficiency in the Estonian language. Other suggestions were directed at the improvement of the marketing of forestry education curricula and to wider internationalisation, for instance to improve the English internet homepages of the university and to use more English in the study programmes. The feedback systems (students and alumni) should be more intensive and collaboration with other universities in Estonia should be enhanced.

The University of Sarajevo is the oldest and the most important university in Bosnia and Herzegovina. Its Faculty of Forestry (established in 1948) is one of the oldest faculties of this university. Till 2005, teaching at the Faculty of Forestry was conducted in the traditional way: a four-year study was followed by a two-year master study and doctoral study. According to MIRZA DAUTBAŠIĆ, ĆEMAL VIŠNJIĆ and FARUK BOGUNIĆ the study programme was reformed in 2005 in the form of a three-cycle system, following the Bologna principles. The undergraduate (BSc) programme has a length of three years, offering two different programmes: Forestry and Horticulture. The graduate/master (MSc) study has a duration of two years with two programmes: Sustainable management of forest ecosystems and Landscape architecture. The doctoral (PhD) programme Forestry and Horticulture has a duration of three years.

The lack of teaching staff and equipment is the main problem impeding a successful implementation of the Bologna principles. Low students’ percentages passing from one year to the next in the undergraduate programme is another problem. Efforts are made to improve this percentage by a more active engagement of professors and students in teaching and learning. Moreover it is tried to improve the mobility of students by harmonisation of curricula and programmes with universities in the neighbouring and other countries and also by signing Memorandums on Cooperation with related European universities.

Introducing her study into the relation between forestry education and forest policy, SEÇİL YURDAKUL EROL states that on the one hand forestry education is accepted as one of the contemporary forest policy tools. Forestry faculties contribute to the policy making process by their scientific research and educational activities. On the other hand the large part of forestry organisation’s staff consists of forestry professionals who graduated from forest faculties. Hence there is a dynamic interaction between forestry education and forest policy.

In the light of this standpoint Seçil Yurdakul Erol examines the development and interactions of forestry education and forest policy in the historical process and their current reflections to each other. A literature review and archive research give the essential data for the historical background. Next, important issues are investigated

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in the content of current forestry policy documents and strategic plans of universities with a forestry education. The main findings showed that “forest faculties and universities” and “science and research institutions” are accepted as the privileged stakeholders in forest policy processes. Also the forestry institutions and organisations were found to be significant stakeholders in the forestry education and research processes.

After independence Kyrgyzstan had to develop its own forestry education on both vocational and university level. NYRYDIN KARABAYEV and ELINA PROKHORENKO describe part of these processes. University forestry education is organised at the Department of Agronomy and Forestry in the Kyrgyz National Agrarian University. At the latter since 2009 a Bologna style BSc replaced the traditional one. Problems to establish a good quality education and the international assistance to achieve that are described.

In the last contribution, EKREM YAZICI states that Forestry education was a key focus of FAO’s activities during the 1990s, but suffered a decline after the abolishment of the Advisory Committee on Forest Education in 1997. However, during recent years, FAO Regional Forestry Commissions (RFCs) and Committee on Forestry (COFO) sessions, and the XIII World Forestry Congress, have called upon FAO to re-establish its forestry education programme, potentially through an enlarged project portfolio. Taking into consideration that various regional networks of forestry education already exist and the limited staff resources, FAO activities in education could be carried out through an enlarged project portfolio and coordinated at the global level, including through the Advisory Panel on Forest Knowledge (APFK) which is under preparation.

In his concluding remarks at the end of the conference, SIEGFRIED LEWARK reflects on the role of both students and teachers in the discussions and in shift from teaching to learning. He states that the role of the students is authentic, but limited: they experience the shift, but on the other hand they have limited theoretical knowledge and are only a short time there, and their interest is – due to many distractions – also limited. Teachers – quite often appointed on the base of their research experiences – have also limited theoretical knowledge and not always are interested in talking – and learning – about teaching, not offending the “good teachers” of course. A promising development is given in the first presentation. And the following articles also demonstrate fruitful things on the move in many faculties of forestry, more or less theoretically based.

## INTRODUCTION

### FROM TEACHING TO LEARNING – WHEN WILL WE TAKE IT SERIOUSLY IN FOREST SCIENCES EDUCATION?

SIEGFRIED LEWARK AND PIOTR PASCHALIS-JAKUBOWICZ

The topic of the SILVA Network annual conference 2013 in Istanbul may be seen as a logical continuation of that of the conference 2012 in Lleida: there we asked: Do our students learn what they will need later? (cf. Lewark, 2014). More detailed questions which were also discussed at an EFS conference (see Paschalis-Jakubowicz *et al.*, 2012), were:

- What do our students learn?
- What should they learn?
- Do they learn what they will need later?

These questions were focussed on the contents of study programmes and even more on the outcomes – the “what”. “The shift from teaching to learning” leads us to the question of “how” the competences wanted may be achieved, as outlined in the conference announcement:

“The shift from teaching to learning”: this formula has been increasingly used in North America as well as in Europe over the last two decades. It is connected with the shift from the Instruction Paradigm to the Learning Paradigm. According to this new paradigm education institutions have to do all they can to fulfil their ultimate responsibility, which is “to produce learning” (Barr and Tagg, 1995). In contrast under the traditional, dominant Instruction Paradigm institutions of higher education “have created complex structures to provide for the activity of teaching conceived primarily as delivering 50-minutes lectures - the mission of a college is to deliver instruction”. Actually this move is going back to articles dealing with the role of the student as active learner as early as in the 1970s. But this more recent shift from an old to a new paradigm is more comprehensive. Barr and Tagg (1995) say: “For many of us, the Learning Paradigm has always lived in our hearts. As teachers, we want above all else for our students to learn and succeed. But the heart's feeling has not lived clearly and powerfully in our heads.” This may be true for teachers in higher forestry education just the same. The shift from teaching to learning was included in the discussions of earlier SILVA Network conferences, but do we really take it seriously?

In our conference we tried to find out, how far we already went in forest sciences education, and what we could do to make more progress. The following texts, based on the presentations at the conference, give some answers.

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## HOW WE TEACH THE TEACHERS – AN EXAMPLE FROM GERMANY

BETTINA JANSEN-SCHULZ

### Abstract

This article refers to an innovative approach of a higher education didactic programme at the Centre for Faculty Services (CFS) at the University of Lübeck, which leads to three different didactic certificates, which teachers can achieve for their academic and teaching career. Innovations are situated on three levels:

- Our approach to academics' teaching skills is oriented towards their teaching competencies, not their deficits.
- Faculty members are free to decide, which competencies to improve and when.
- The programme's modular structure is an open concept, with the choice of course determined by the academics' own competence levels, interests and time available.
- The certificate-programme offers more than 50 courses. There is a three-year time frame for completing the certificate programme. The diversity concept in higher education is based on interdisciplinarity and inter- and transcultural settings, combined with the principles of integrative gendering (including aspects of gender and diversity in academics' everyday teaching).

Results after three years<sup>1</sup>:

- There is a noticeable increase in the demand for teaching certificates. This fact should be reflected and given more weight in appointments of professors.
- Since 2012 we had 429 participants, 211 female, 218 male with 1092 course participations.
- We reached approximately 50% of all teachers in the university in the first three years of the programme.

Keywords: Higher education didactic, certificate programme, gender-diversity, open course concept, competence orientation

### Introduction

The German standards of "Learning and Teaching in Higher Education" (LTHE) have seen a paradigmatic shift from teaching to learning, which, though not exactly new, is still very difficult to realise as a university teacher as well as a teacher of teachers. A lot of university teachers still think that they just have to impart knowledge to their students and learning will take care of itself.

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<sup>1</sup> This article was written in 2013 after two years running of the programme, the data in this article have been updated with those of 2014.

That this type of knowledge learning is not enough to empower the students' competencies is shown by the change in the study structures introduced in the European Bologna process as well as the new chances provided by the new media to learn, what and when you need it – and that worldwide (cf. the example of MOOCs, Massive Open Online Courses).

Before presenting the open course concept of learning how to teach in higher education at the Centre for Faculty Services (CFS) of the University of Lübeck, I want to explain some German national standards of LTHE:

National framing conditions for further education in LTHE:

- There are no legal requirements (either at federal or state level). There are, however, some recommendations from the German Rectors' Conference (Hochschulrektorenkonferenz, 2008), the German Science Council (Wissenschaftsrat, 2008), and from the Foundation Association for the German Science (Jorzik, 2013) on what “good teaching” should be and what structures are necessary in academia.
- Recommendations for a national standard for LTHE have come from the German Society for LTHE and the Network for Teaching and Learning in Medical Education. These bodies have published quality standards for LTHE which are accepted by most didactic centres in Germany, even though there are no recommendations at state level.

At the level of the federal states, there are some networks of the LTHE institutions and some regional networks and workgroups for the issues of media education, health-and-medical education, coaching, the advancement of junior scientists, higher education coaching, and gender and diversity:

- Most German universities (80-90%) by now have didactic centres for the instruction of professors and junior academic staff in the teaching of contents and methods in higher education. These further education programmes are usually structured as a number of – mostly consecutive – modules.
- Participating members of staff are awarded a teaching certificate after a minimum of 120 and a maximum of 220 units, or 10 to 20 courses (one unit = 45 minutes]. These standards are accepted by all German higher education centres and constitute the basis of their programmes.

The Centre for Faculty Services (CFS)<sup>2</sup> of the University of Lübeck has offered, in contrast to other centres, not a programme of consecutive modules, but an open-course concept while of course also meeting the quality standards of teaching in higher education.

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<sup>2</sup> A project of the University of Lübeck, supported by the Quality Pact for Teaching of the Federal Ministry of Education and Research 2012–2016. Since February 2013 it has been a central institute of the University of Lübeck.

The CFS has two main duties and responsibilities:

- LTHE: We offer a large certificate programme with more than 50 courses p.a. on good teaching, students' course evaluation and that of LTHE. We also support the development of medical curricula, and we offer individual coaching to experienced professors.
- Human resources management of the University of Lübeck: We are developing an open- course programme of professional development – further education for leaders, researchers, teachers, and administrative staff, which started in autumn 2014.

The addressees of CFS services are all members of the academic staff of the University of Lübeck across the two divisions, as well as the faculty members of the Lübeck University of Applied Sciences (the buildings of which are adjacent to those of Lübeck University), which offers teaching in the MINT subjects as well as the university.

Lübeck University is Germany's smallest public university with

- 3,500 students;
- 160 professors;
- 485 faculty members in two divisions: Medicine, MINT (Mathematics, Information Technology, Natural Sciences, Technology);

The University of Applied Science has

- 4500 students;
- More than 100 professors and other academic teachers.

### **The Lübeck Open-Course Concept (LTHE)**

So, what we have to take into account for the conception of our programme are the two universities' academic staff in the context of teaching and learning cultures in MINT, Medicine. This is one of the reasons for an open course concept.

We offer more than 50 courses p.a. on LTHE. The academic staff members are free to choose both which courses they want to do and when they want to do them. We divide our over 50 courses into six areas of teaching-competence for higher education (cf. Figure 1): Didactic competence, methodological competence, examination competence, media competence, leading competence, and competence in the areas of gender and diversity. Being the main competence areas in LTHE3, they have been well researched in the last few years and are based on the theory of social constructivist learning (Siebert, 2008).

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<sup>3</sup> See Fiehn et al., 2012; Trautwein and Merkt, 2012; Heiner, 2012; Heiner and Wildt, 2013; Webler, 2011; Brinker, 2012; own research in LTHE LeWI 2008-2012, <http://www.zhb.tu-dortmund.de/hd/lewi/>; Stelzer-Rothe, 2008



Figure 1: Model of Teaching Competences.

The following brief notes will give a first impression of what we do in the several competence areas.

- *Didactic Competence* includes the knowledge about individual learning settings, the strategies for translating this knowledge into learning situations with regard to contents and structures.
- *Methods Competence* includes the knowledge about those methods, which will support individual learning processes.
- *Media Competence* in LTHE refers to the didactic competence as well as the methods competence. It helps to choose the media for specific learning situations; in our case mainly the competence to use electronic media is important.
- *Examination Competence* is about the competence to conduct examinations in such a way, that the students can demonstrate not only the level of their knowledge, but the competences they have acquired. It includes also the ability to counsel students.
- *Gender, Diversity and Intercultural Competence* includes gender competence, diversity competence as well as didactic and methods competence. The academic staff is sensitised in this competence area to gender aspects and issues in social relations, socio-cultural differences and various forms of discrimination in academic society, in academic learning structures and in contents.

Table 1: Assigning of courses to competence areas.

Competence Area	Courses	WU	Competence of Methodology (total course: 84 WU)			
<b>Micro (6)</b> (total course: 54 WU)	Teamwork (supervision skills)	6		Techniques of Presenting	12	
	Applying media in teaching (media skills)	6		Clinical Teaching	12	
	Methods of examination in Medicine, the Sciences and Engineering (examining skills)	6		Lecturing and Presentation Techniques	12	
	Clinical Teaching (methodology)	6		Methods of Feedback	12	
	Techniques of Presenting (methodology)	6		Problem Based Teaching and Learning (PBL)	14	
	Problem-Based Teaching and Learning (PBL)	6		Methods in Seminars in MINT	16	
	Planning a Workshop (didactics)	6		Techniques of Lecturing and Presenting (German and English)	6	
	What is Good Teaching? (didactics)	6		<b>Didactic Competence (total course: 60 WU)</b>	Principles of Good Teaching	12
	Teaching in an Intercultural Setting (intercultural competencies)	6			Research of Higher Education	12
<b>Leading Competence (total course: 40 WU)</b>	Methods of Creativity in Teaching and Research	12	Planning Lectures		12	
			Team Leadership		16	
			Leading Learning Groups		12	
<b>Examining Competence (total course MED: 16 WU) (total course MIST: 12 WU)</b>	Examination Goals Examination Formats Methods of Examinations in MINT Methods of Examinations in Medicine: OSCE	12	Short Lectures in Medicine		12	
			<b>Training the Tutors (48WU)</b>		Intelligent Exercises in MINT	12
					Didactic Methodology in MINT	22
					Didactic Methodology in MINT	12
<b>Media Competence (total course: 24 WU)</b>	E-Learning 2.0, Interactive Learning and Teaching with Moodle	16	Didactic Methodology in MINT	14		
			<b>Specials (total course: 36 WU)</b>	Interdisciplinary Teaching	12	
<b>Diversity Competence (total course: 40 WU)</b>	Inter- and transcultural Teaching Gender and Diversity in Teaching English for Teaching	16		Voice Development	12	
			Teaching Portfolio	12		
			English for Teaching	12		
	Smart Board	8				

WU= work Unit

- *Leading Competence*, finally, encompasses other duties that academic staff has to carry out, such as leading teams, projects, or groups.

The principal courses of the LTHE Programme (most of them are offered twice a year) and the division of courses into competence areas are given in Table 1.

### **Educational beliefs for teaching in higher education**

In our courses we work with these three beliefs:

- Our approach is based on the teaching competencies of our clients, not on their deficits.
- Our orientation towards students means a shift from teaching to learning, i.e. changing the teacher's role from content instructor to learning consultant.
- Our orientation to applied science means a shift from theory to practice. Our theoretical basis is the constructivist learning of academic adults.

#### *Our approach is based on competencies, not deficits*

Faculty members already have a command of certain teaching competencies, both from their student days and in their roles as teachers. They know already something about learning; they have their own ideas about learning, even though they did not study education sciences. This means that our courses and our course leaders can build on this knowledge for their didactic concept.

Staff members determine themselves, when and where they want to improve existing teaching competencies or develop new ones. They have made academic learning experiences, i.e. they have learned, and are learning, through research as well as teaching ("learning by doing") on a high academic level.

This means that our job is about empowering faculty members by improving their teaching competencies.

#### *Shift from teaching to learning*

The shift from teaching to learning means a shift from instruction to learning empowerment. That requires a change in the teaching role as well as a change in methods. There are some effective didactic methods, with which the individual learning processes of the students can be developed. It is these and other methods that we practice with the participants in our courses:

- Research-oriented learning involves the students in scientific thinking, in research processes and research projects, and demonstrates the need of theories.
- Inter- and transdisciplinary learning provides both a more comprehensive view of the respective theme, and the inter- and transdisciplinary contexts of the discipline.
- Problem-oriented learning provides for learning by doing in disciplinary contexts.
- Transfer-oriented learning demonstrably increases the employability of students.

- Integrative Gendering – i.e. integrating gender and diversity aspects across all teaching areas – involves the consideration of aspects of gender and diversity in the disciplinary content, in didactic structures and in the choice of the teaching and learning methods (Jansen-Schulz, 2011; 2012).

### **Shift from theory to experience**

Students are often faced with the problem, that they first learn theories without knowing why nor of what use the theories are – this is particularly so with regard to mathematics, for this is often very theoretical and students do not understand the use of mathematics. That is the reason, why we discuss with our participants the question of whether and how they can firmly establish the need for theories, especially in mathematics. This is made possible through the shift from theory to experience, which occurs in three steps:

- First step: offering practice and experiences;
- Second step: offering theoretical insights into practice and experiences;
- Third step: modifying theory and practice step by step.

#### *Constructivist learning*

The main theoretical basis of our courses is the social constructivist learning theory (Siebert, 2008), which is the main basis in adult education and should be basis in higher education as well. It is included in all our didactic efforts as well as the learning goals for professors, junior academics and last but not least for the students. Social constructivist learning means that knowledge is first constructed in a social context of the learner due to his professional or individual everyday experiences and is then appropriated by individuals. The method requires to communicate and work together with other learners and is built on the competences of the learners. That means that teachers or instructors have to adapt to the role of facilitators and not of teachers who just give input. While a teacher gives a didactic lecture that covers the subject matter, a facilitator helps the learner to get to his or her own understanding of the content.

### **Certificates**

Our more than 50 courses give the participants the chance to attend all courses to earn either the “Teaching Certificate III” with over 20 courses, or the “Teaching Certificate II”, corresponding to over 10 courses, or the Micro Teaching Certificate I, corresponding with 6 micro courses. The participants are free in their choice to get a certificate or not and which certificate.

For special groups and special needs we provide help also in some other teaching formats:

- Individual coaching offers (we experienced an increased demand in 2013);
- Welcoming programme for new faculty members (in preparation);

- Successful participation in courses in LTHE is stipulated in the regulations of the post-doc qualification;
- Earning “Micro Certificates“, consisting of just six micro courses, is another option, especially helpful and sought after by post-docs.
- Undergraduate students can earn ECTS credits for higher-education courses on conducting tutorials.
- Scholarship of teaching and learning (SoTL): one of our concept goals for the future is to implement aspects of scholarship in teaching and learning to motivate professors and junior academic staff to reflect on their own classes and teaching using research methods.
- To practice SoTL, we offer various teaching formats, interested participants must not visit all courses; they can earn their credits due to following steps:
  - Expert-coaching (see Table 2);
  - Co-operating coaching;
  - Teaching concept: educational beliefs;
  - Own research on their teaching with pre-decided categories;
  - Visiting pre-decided courses for SoTL.

Other possibilities for obtaining credits in LTHE are:

- Participants can make up for missed sessions by doing substitute assignments , e.g. composing a brief sketch of their educational beliefs;
- Teaching awards in MINT and Medicine;
- Best Practice and teaching awards: formulation of educational beliefs;
- Visiting and presenting in the didactic lounge: presentations of best practice teaching by the winners of teaching awards in MINT and Medicine.

Table 2: Coaching concept.

Goals	Steps
Critical reflection on educational beliefs	Sitting-in on classes, applying tools of observation
Critical reflection on own disciplinary teaching and learning culture	Expert disciplinary and interdisciplinary advice
Knowledge about theories of learning in adult education, neurodidactics and LTHE	Discussions on sitting-in on classes
Knowledge about concepts for teaching and learning in LTHE	Intervention – modifying formats, contents and methods of teaching
Knowledge of methods in LTHE	Input from LTHE-experts
	Changing teaching concepts

### **Outreach statistics: participants and their learning outcomes**

Starting in April 2012, our programme has now been running for three years, and compared with other LTHE offerings in Germany has developed into a very successful programme. In the last three years we reached 429 persons (218 male, 211 female) with 1092 participations, or to put it in different terms, approximately 50% of faculty overall, and 20% of the professors at Lübeck University, while 15% of the junior academics and 10% of the professors from the Lübeck University of

Applied Sciences enrolled on our programme. 40 participants (9.3%) have already acquired one of the teaching certificates (micro, II, III).

The participation rose in the first two years very fast (see Figure 2). In the third year the participations decreased due to the fact that we reached already nearly 50% of all teaching persons in the university.

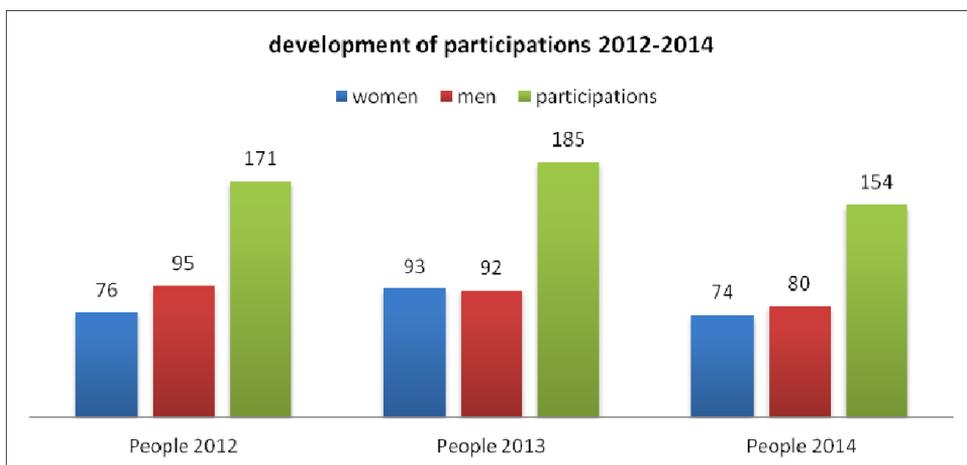


Figure 2: Development of participation 2012-2014.

In the first year the participants took part in the competence areas, mostly attending courses on teaching methods (see Figure 3). We observed nearly the same attendance in the second and third year.

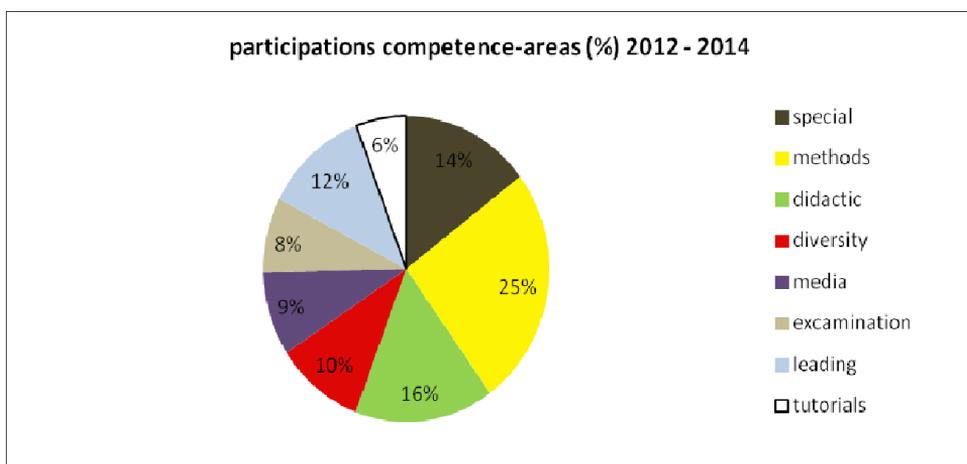


Figure 3: Participants according to competence areas.

The evaluation of each course in didactics and the overall averages of the first year and the third year show a high degree of satisfaction with the participants' learning outcomes (see Figure 4).

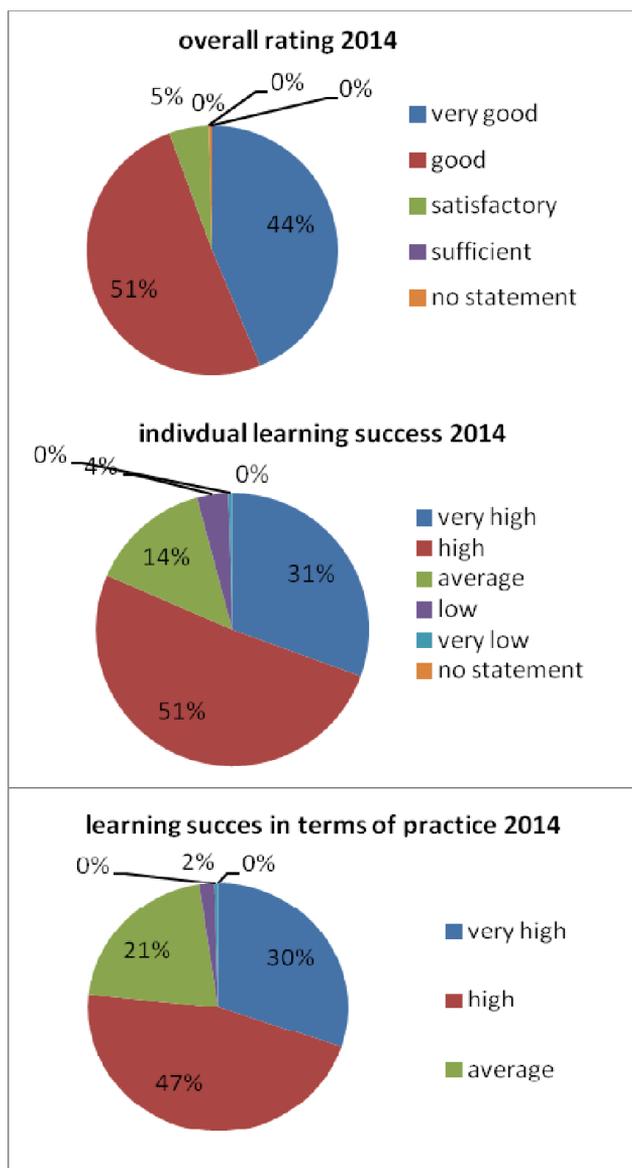


Figure 4 Course Ratings.

The annual external evaluation questionnaire 2013 enquires about the self-assessment of the competence development of participants. The two-year longitudinal view 2012-2013 (see Figure 5) shows the development of teaching competences in the self-assessment of the interviewed participants<sup>4</sup>.

<sup>4</sup> The external evaluation for 2014 was not yet finished, when this article was written.

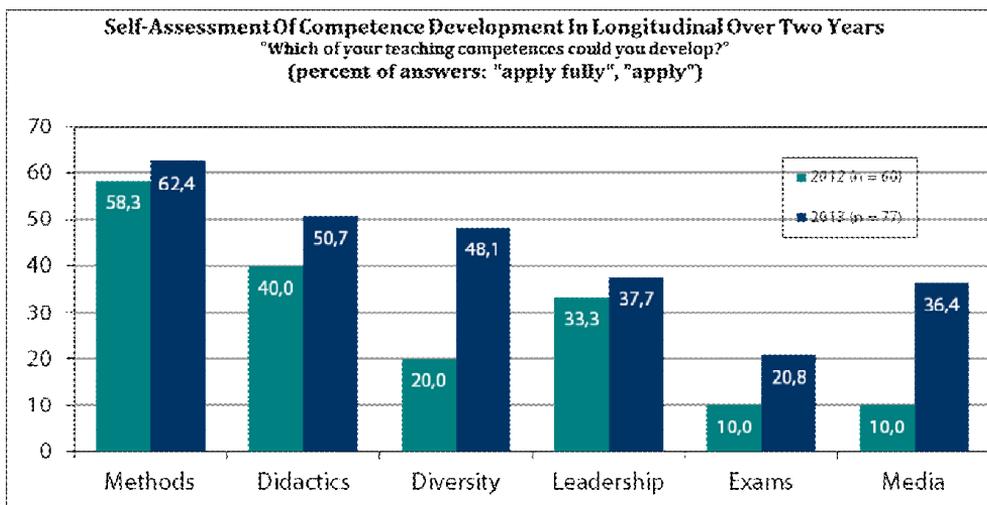


Figure 5: Self-assessment of competence development (Brüheim, 2014).

## Conclusion

The higher education programme presented here is part of the human resource development of the University of Lübeck. Due to the success of this open courses competencies orientated concept the university started a new similar programme of internal education for all university staff. It started in November 2014 and seems to suit the education interests, for there is a run on these courses too.

Within three years the CFS has grown into an important institution within the University of Lübeck for its education and teaching culture, which meets with high acceptance from the highly motivated faculty – due to the open course concept and its orientation towards competencies as well in higher education as in internal education.

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# **THE SHIFT FROM TEACHING TO LEARNING: IS THIS REFORM NECESSARY FOR THE FORESTRY ACADEMIC EDUCATION?**

**ACHIM DOHRENBUSCH**

## **Abstract**

Improving education in general is an important political goal, but there is a disagreement about contents and form. For about 20 years there is a shift from teaching to learning (Bologna principles) at most universities. This change means turning away from an input-management system which is based on contents to an output-management system, which is focused on the so-called learning-outcomes. While the traditional system is mainly orientated to the presentation of teaching contents, the proposed new system regards the results of learning. On university level this shift is visible from the students' working hours (students' workload). This includes a change of the teachers' position, learning based on the results, promotion of self-organized and active learning and respect for social aspects of learning.

Higher forestry education has a long tradition with a strong connection to the forest administration. There are clear demands of professional knowledge. Therefore, higher forestry education is not very well suited to realize the principal shift from teaching to learning. But even if it is generally accepted that the shift from teaching to learning could be a useful improvement in education and forestry education as well, these new methods will not solve the current problem that more and more young people with low prospect of success attend university.

Key words: teaching, learning, forestry education, employability.

## **Introduction – Education as a global challenge**

Most political programs demand better education and more investments in education. The portion of investment on the gross domestic product (GDP) is often used as an indicator for the importance and quality of education in a country. According to an OECD assessment (Organization for Economic Co-operation and Development) the 35 member countries of the OECD invest 5.4% of their GDP for education as an average (OECD, 2014). This mean value is valid for the USA, Mexico, Poland, Hungary, and Austria. Perfect conditions with a percentage between 7 and 8.4% were found in the Scandinavian countries whereas Greece, Japan and Turkey represent the other side of the list with a percentage between 3.3% to 4% only (OECD, 2014).

The United Nations have declared the period 2005 to 2014 as the “Decade for Education of Sustainable Development“. According to this declaration “All people should provide education opportunities that enable them to acquire knowledge and values and learn about behaviour and lifestyles required for a sustainable future and the creation of a sustainable society...”.

Independent of the political orientation of political parties: All agree in more investment in education, but they disagree in form and contents of the best education. Everybody in policy and on the street believes to be an education expert. So there is probably no other political field, where politicians use education as a “playground“ for their personal favourites.

The political message worldwide is to improve education on all levels. Arguments on individual level are the perspective on higher income, better quality of life and higher degree of personal satisfaction. On a societal level a higher share of well-educated people is regarded as a general quality feature of a population and an argument for better economy. Furthermore, there is the opinion that there are less conflicts among educated people because they are supposed to be able to find better ways to solve problems.

### **Assessments on education on national level**

Will these experiences hold in future? Will better education improve the income expectations in the different countries? Since 2000 the OECD is testing the average knowledge of 15-year-old pupils in various countries every three years. Three large fields of competence are tested: reading competence, natural sciences and mathematics. It is a first surprise, that a bad ranking position on the list of investment for education (see above, Anonymous, 2008) does not mean automatically a bad position in the PISA ranking: Japan with an investment of only 3.3% of its GDP for education on the last position is concerning the PISA results at the top. Turkey, however, with an investment of only 4% is also on one of the last positions of the PISA results (OECD, 2014).

In addition, in 2012 the OECD launched another test for adults (16-65 year old population) which is focussed on the assessment of basic competences (PIAAC = Programme for the International Assessment of Adult Competencies) (Rammstedt, 2013). In total, a number of 166,000 people from 24 countries (USA, Russia, Australia, Canada, Korea, Japan and countries of the EU) were tested in three areas:

- Reading competence;
- Mathematical competence;
- Solving problems with modern communication systems.

A not very surprising result is that the competences of adults are correlated significantly with the education (Rammstedt, 2013). Figure 1 shows this context exemplary for the reading competence.

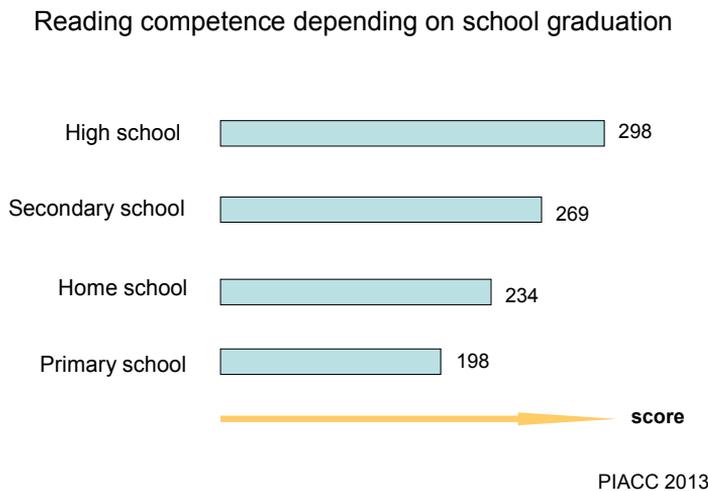


Figure 1: Reading competence depending on school grades (high score values indicate better competence) (Rammstedt, 2013).

This PIACC study also shows an interesting correlation between the average income and the average level of education (indicated as mathematical competence). In all investigated countries there is a clear income gradient depending on education. The highest education level results in highest income, mean education level in mean income and lowest education level in lowest average income. One interesting result is that there are big differences between the investigated countries. In the Scandinavian countries the advantage of a better education seems to be less important than in the USA or Japan (Rammstedt, 2013).

### The Shift from Teaching to Learning

Even if there is not in all countries a clear evidence, that a qualifying education is the guarantee for better income and satisfying life quality, there is a wide agreement, that education in general is important. But there is, however, a clear disagreement about contents and formal aspects. The SILVA annual meeting 2012 in Lleida (Catalonia/Spain) was focussed on the content aspects: What should we teach? The motto of the conference was “Do our students learn what they will need later?” One year later, the conference in Istanbul was concentrated on the formal side: The motto “The shift from teaching to learning” deals with the question “How should we teach?”.

From Teaching to Learning was the title of a much observed book with the subtitle “A New Paradigm for Undergraduate Education” by Robert B. Barr and John Tagg. Here they propose and demand (according to a figure of speech of the UNESCO) a

“Shift from Teaching to Learning“ for the education and higher education systems (Barr and Tagg, 1995).

This change – also visible in other fields of the „New Public Management“ – means turning away from an input-orientation system which is based on contents to an output-management system which is focused on the so-called learning-outcomes. While the traditional approach is mainly orientated on the presentation of teaching contents, the proposed new system regards the results of learning. On university level this wanted shift is visible at the nowadays practiced orientation on the students’ working hours (students’ workload). This means:

- Change of the teachers’ position (from a clear instruction to an arrangement of learning environments and learning advices);
- Learning based on the results;
- Promotion of self-organized and active learning;
- Notice of motivation and social aspects of learning;
- Combination of knowledge acquisition and the acquisition of learning strategies.

According to Wildt (2003) a number of students’ competences can be listed, which should be used to evaluate the learning success. He divides the list of competences in two groups. Level 1 competences of high importance are:

- Capacity for analysis and synthesis;
- Capacity to learn;
- Problem solving;
- Capacity to apply knowledge in practice;
- Capacity to adapt to new situations;
- Focus on concern for quality;
- Information management;
- Ability to work autonomous;
- Teamwork;
- Will to succeed;
- Basic knowledge.

In addition to that he defines on level 2 further competences of lower importance, such as:

- Understanding of cultures and customs of other countries;
- Appreciation of diversity and multicultural environment;
- Ability to work in an international context;
- Leadership;
- Research skills;
- Project design and management;
- Communicate with experts in other fields;
- Ability to work interdisciplinary;
- Knowledge of a second language.

It is remarkable, that among this variety of competences knowledge of specific topics is not listed, only basic knowledge is demanded on the last position of the level 1 list. On the contrary, the so-called soft skills play an important role. There is a general agreement that soft skills can be grouped into the social competence, self-competence, decision making and responsibility, competence in methods, and finally professional competence, which means, that there needs to be at least a minimum of knowledge in a specific subject (which is still the relevant part of an oral or written exam at school or university). The so-called learning outcomes can be related to two aspects: the academic quality, which is mainly an aspect on university level, and second the fitness for the job market. That the old system was not leading to good employability, is probably the most important reason for propagating the shift from teaching to learning. In this context employability is defined as the generic competence to overcome the changing challenges within the occupation. And in addition to this competence of better employment perspectives, the goal of “Citizenship“ is of increasing importance. This is defined as the competence to participate actively in the forming of the social living (Haug and Tauch, 2001).

### **The Forest Sector**

In the first part of this paper the Bologna shift from teaching to learning was shown on a general level. In the following, it will be discussed whether and how this Bologna demand is a relevant aspect for higher forestry education. Did we start to realize the shift from teaching to learning in the academic forestry education?

In comparison to many other study programmes on university level traditional higher forestry education is characterized by many exercises, which improve students' self-experience, and numerous excursions, where practical examples and different opinions help to improve employability. In addition to that, common projects are essential parts of the forestry curriculum and co-operation with people from daily practice are helpful to get different competences, not only professional but also social, methodical and self-competence. Hence, a traditional forestry education had already in the past (before Bologna) a high portion of teaching elements which are very close to the Bologna principles. After the Bologna conference there was a trend towards more soft skills, more elective courses and less compulsory courses (Wildt, 2003).

Traditionally employability is an important aspect of the forestry academic education. In Germany in the past decades the public forest administrations was the main employer for most forestry graduates. Therefore, the officers of forest administrations had clear demands for the contents of forestry education even on university level. However, for the last 15 years public forest administrations are no more the most important employers for forestry graduates. Job numbers in the public service have been reduced significantly, at the same time new job options on the private sector have been coming up. Nevertheless, public forest administration

officers – responsible for the human resources – try to influence content and methods of academic forestry education. With respect to an improvement of employability of the graduates there is still the willingness of the universities to respect the special wishes and demands of the forest administration, the potential employers. Hence, the forestry academic education in comparison to many other study programmes seems to be much more oriented to the generally wanted shift from teaching to learning.

### **In the end: A critical remark**

During the last decades there is an increasing pressure on universities in order to improve academic education. The mentioned shift from teaching to learning is just one part of this big political goal. Unfortunately, policy did not take into consideration, that there is also the other side of the coin: a good study programme only makes sense for students, who are able to study successfully. This is an increasingly difficult development. The general political goal for decades is to bring more young people to an academic degree. In 1994, only every fourth young person was starting to study at a university in Germany, ten years later it was nearly 40% and now every second pupil tries to start his career at an university (Anonymous, 2012). The logical consequence: more and more young people go to university according to the general trend, but are not qualified to manage it. It would be much better for these people and for the society, if they would start their occupational career with other specifications, such as an apprenticeship. In order to improve this development, that university should not be a way for everybody, it is important to improve the societal status of jobs, which require training. This should be a challenge for our society.

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## **ARE STUDENTS SUFFICIENTLY PREPARED FOR LEARNING? EXPERIENCES FROM A SURVEY AMONG BACHELOR STUDENTS AND LECTURERS AT TECHNISCHE UNIVERSITÄT DRESDEN, GERMANY**

**NORBERT WEBER AND LIA STEFKE**

### **Abstract**

To gain insight into individual perceptions of the introductory phase to the Bachelor programme “Forstwissenschaften” (Forest Sciences), a survey was conducted which addressed students and lecturers of the Department of Forest Sciences of the Technische Universität Dresden in 2013. Questionnaires were sent out to 21 lecturers (professors and senior lecturers) of the department and distributed to 121 students after a lecture. 13 questionnaires from lecturers and 88 from students could be analyzed. The results point to differing expectations from the lecturers’ and students’ points of view. Amongst others, lecturers complain about missing competences in school subjects like English, biology or chemistry and a misfit between expectation and real development of the cognitive dimension. On the other hand, 41% of the students feel that they are not sufficiently or not at all prepared for the study programme. Although a lot of proposals have been made to improve the situation, their realization would necessitate financial means and additional staff capacities.

Keywords: introductory phase of study programmes; key qualifications; first-year students; forest sciences; Bachelor programme

### **Background of the survey and research questions**

Higher education in Germany is facing the challenge that first-year students are more and more diverse with regard to knowledge and skills, preconditions of learning and experience of life. Connectivity between ‘school knowledge’ and university education is not taken for granted. Schools and universities are blaming each other for being responsible for that fact. As a consequence, many universities try to identify and compensate individual gaps of knowledge at the beginning of the study programmes by offering specific adjustment programmes (Webler, 2012; Stifterverband, 2014).

Likewise in programmes of forest sciences, students today are often complaining about excessive demands at the beginning of their study programmes, while lecturers are concerned about increasing deficits of knowledge that should have been imparted and/or acquainted at school. Against this background, a survey among students of the first year Bachelor programme in Forest Sciences and the

lecturers of the Department of Forest Sciences at Technische Universität Dresden was launched in the winter term 2012/2013. The survey was conducted in the framework of a Master thesis (Stefke, 2013). It aimed at answering the following research questions:

- How do first-year students feel when starting their studies?
  - How do they estimate their professional and generic competences?
  - What are the reasons to study forest sciences – in general and at the campus in Tharandt?
  - What about their motivation for performance?
  - Do they have a clear aim with regard to their professional career?
- What does “being prepared for studies” mean from the lecturers’ point of view?
  - Which characteristics, skills and competences should students have?
  - Which kind of professional competences are important in certain disciplines for the study programme?
  - How far do students have these competences?

### **Methodical approach**

To find answers to the questions above, different questionnaires (although with many identical paragraphs) were prepared for students and lecturers, respectively. The questionnaire for lecturers commenced with general recommendations how to fill in the answers. This was followed by three paragraphs focussing on (i) the transition phase from *Gymnasium* (grammar school) to the university; (ii) the students’ ability to study as requested from the lecturers’ point of view and perceived by them in reality; (iii) the length of their teaching experience at the department or other universities, if applicable.

For the students, the questionnaire also started with general recommendations. Then, five blocks addressed the issues (i) attainment of the university entrance degree (*Abitur*), (ii) transition from school to university; (iii) experiences during the study programme; (iv) motivation for performance and (v) personal data.

The questionnaires were sent out to 21 lecturers (professors and senior lecturers) of the department and distributed to 121 (male 73, female 48) students after a lecture. To get an insight into the motivation for performance, a standardized research approach developed by Schuler and Prochaska (2000) was integrated into the questionnaire for the students.

### **Results**

#### *Response of the lecturers*

From the lecturers, 13 questionnaires out of 21 (62%) could be analyzed. These results may not be statistically reliable for a larger group of lecturers. However, they shed light on the perception of the lecturers at the campus.

Taking a look at the difference which expectance lecturers are attributing to the students' capabilities in different school disciplines, the difference between expected and observed development becomes obvious in all disciplines (see Figure 1).

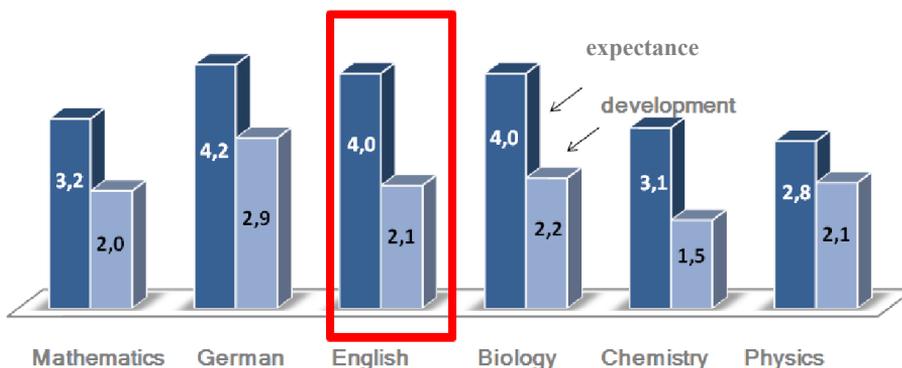


Figure 1: Expected and observed development of grades for subjects taught at school (scale from 1, best, to 5, failed).

Asked separately for their estimation how far students are disposing of computer skills, lecturers were mostly pleased and stated some deficits in the field of managing spreadsheets software. With regard to scientific working, a large discrepancy became evident (see Figure 2).

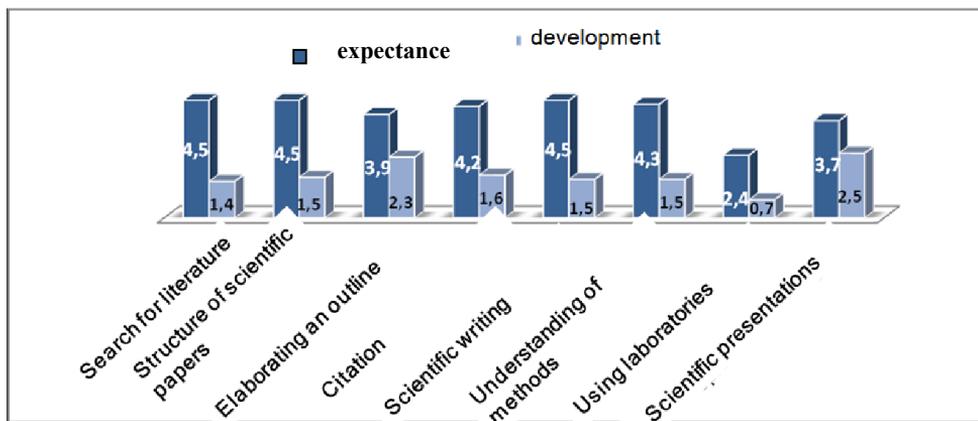


Figure 2: Expectance and real development of skills in scientific working.

Virtues, as certain perceptions and habits, are seen as essential elements of the ability to study by all lecturers. To these belong, amongst others, honesty, tolerance, accountability, punctuality, courtesy, ability to question own behaviour. In general, lecturers estimate that these virtues are decreasing, with the exception of tolerance.

In educational sciences for the ability to study four categories have been identified. These have been called cognitive, social, personal and professional (Konegen-Grenier, 2001). The lecturers participating in the survey point to the largest gap in the cognitive sector, i.e. 2.01 (see red arrow in Figure 3).

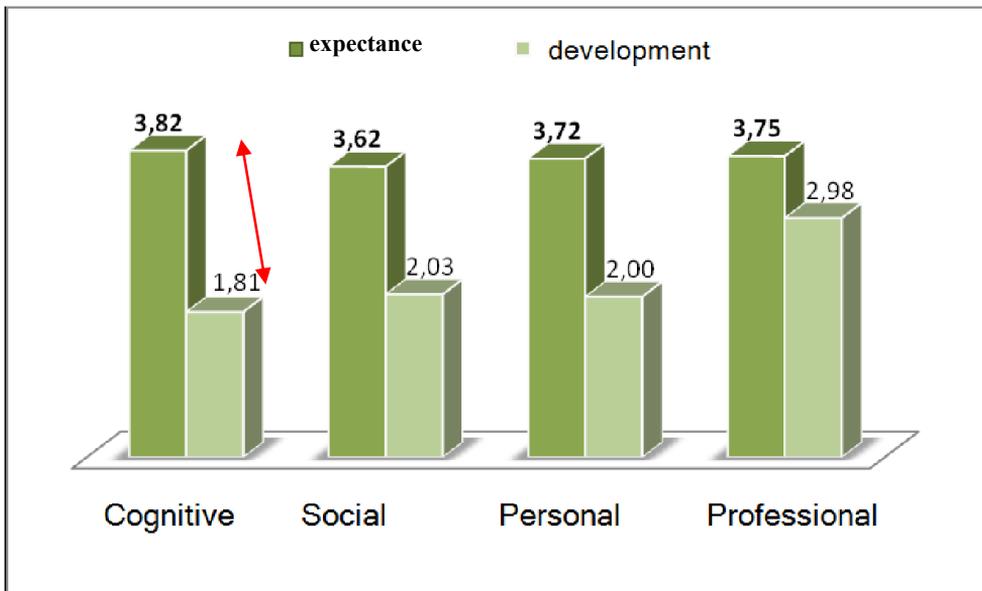


Figure 3: Expectance and real development of four categories of ability to study forest sciences (scale from 1 to 5).

To address the difficulties, lecturers recommend different measures: Practical placement of several months; an internal entrance examination; two-month course at the beginning for introducing into forest sciences; bridging courses as e-learning or as lectures. The most mentioned subjects where deficits are observed are mathematics, chemistry, English, biology, and scientific working. However, some of these observations have only been mentioned once, so there is no clear picture about necessary actions.

#### *Response of the students*

More than half of the students (88 out of 121, i.e. 73 %) have returned their questionnaires. Of these, 33 (38%) were female and 53 (60%) male. 84 students were of German nationality while two students came from Belgium and Russia, respectively. With an average of 21.6 years, the age of the students varied between 19 and 30 years, most of them were between 20 and 23 years old (78%). None of the participating students mentioned to have children.

Most of the students (64) obtained an average “*Abitur*” grade between 2.0 and 2.9 (on a scale from 1 = excellent to 4 = passed). Twenty-three students scored between 1.0 and 1.9, while 13 students were graded from 3.0 to 3.9. Asked about side jobs, 28.4% of the students mentioned that they are employed in such a job while 64.8%

denied and 6.8% did not answer the question. Two of the addressees mentioned that their side job is related to the study programme.

With regard to the school subjects, knowledge of German, mathematics and English has been acquired on basic and advanced course level, respectively. In contrast to that, physics and chemistry are not well developed as 30 to 50% of the students have to rely on knowledge up to the tenth class of school. There are no clear statements available about other subjects.

Competence in scientific working was assessed by asking the students how they come up with the task of producing a short scientific paper. Thirty percent answered “well, very well”; 37% were “unsure” and 8% estimated their competence as “bad”; 15% gave no answer. Further details are given in Figure 4.

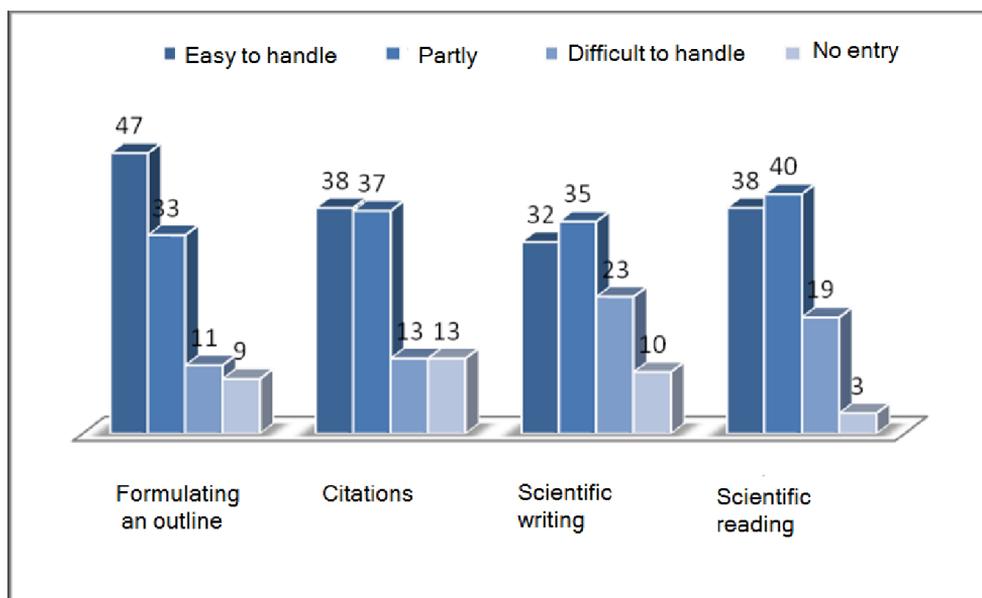


Figure 4: Students' competence in four categories of scientific working (in %; n = 88).

Most of the students do not have problems in formulating an outline for a scientific document as this was already part of education at school. The other core competences, i.e. how to cite correctly; scientific writing on the whole; and scientific reading reveal a little bit more of deficits.

In all, 51% of the students evaluate the preparation for the study programme as very good or good, 34% as not sufficient, and 7% stated that they did not feel prepared at all. It has to be mentioned here that 12.5% of the students feeling not sufficiently prepared have studied and terminated another study programme before without graduation.

Asked about generic competences (cf. Figure 5), 74% of the students estimate to be able to work in a team. Other competences like abstraction, argumentation and self-organization revealed much lower values.

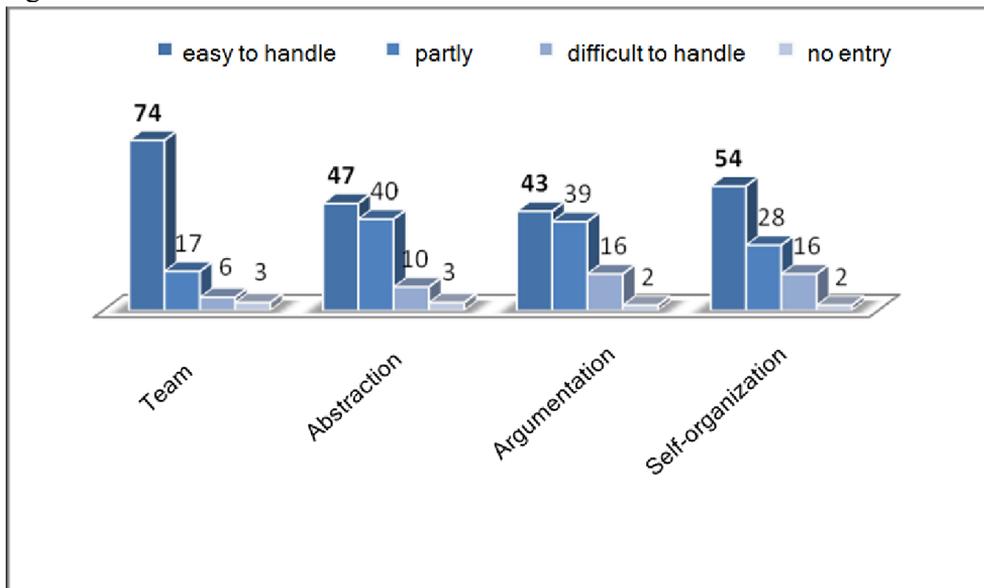


Figure 5: Generic competences of the students (in %; n = 88).

Figure 6 displays the distribution of the so-called stanine (Standard Nine) values in total and distributed by gender. The stanine scale is known from psycho-diagnostics as a standardized point value system ranging from 1 to 9, a median of 5 and a standard deviation of 2. While “9” stands for a very high motivation to perform, “1” means a very low one. According to that classification, only 1% of the students show a very high motivation. Most of the students (23%) are found in the lowest category of stanine 1. Male students are found from 1 to 9 while female students are mostly represented in medium values and do not cover the highest ranks 8 and 9.

One of the most interesting results is the late time of decision to study forest sciences (Table 1). Most of the students (68%) make up their mind very late, i.e. shortly before the “Abitur” (university entrance diploma) or even later. As most important aspects for the decision, professional interest is at the top of the ranking (90.3%); developing personality and environmental awareness are following with 80.3% and 66%, respectively. With only 50.6% safety for finding/keeping a job and career-orientated deliberations (38%) are obviously of lower importance. At least with regard to the expectance of tradition in the professional field, traditional aspects are ranking very low with 18.1%.

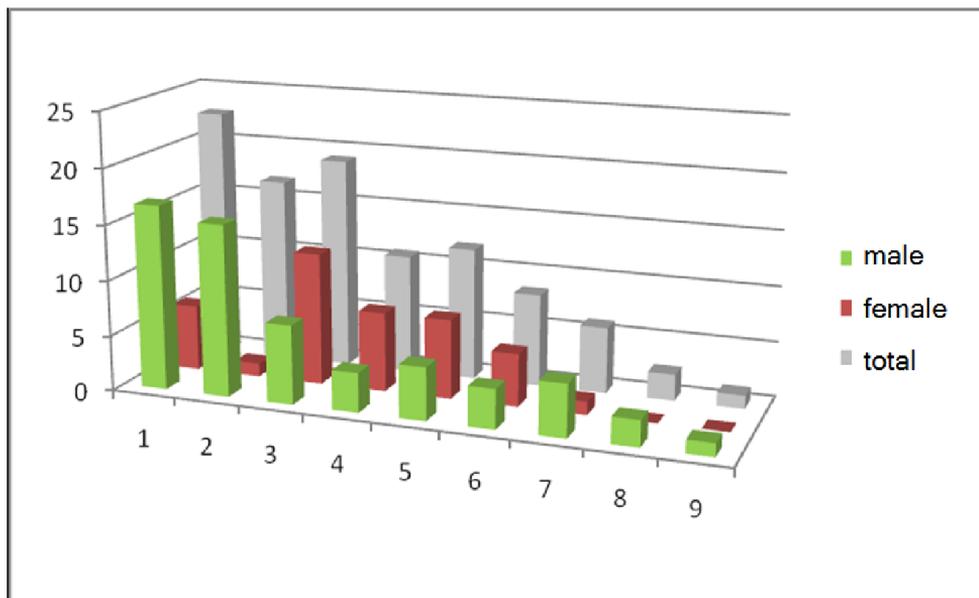


Figure 6: Motivation of students as expressed in stanine-values (1-9), total value and gender (in %; n = 84)

Table 1: Time of decision to study forest sciences (n = 88).

Time of decision	Number	Percent
Before 10 <sup>th</sup> grade	8	9
Begin of course system*	3	4
During last year of school	17	19
Shortly after Abitur	20	23
Later	40	45
Total	88	100

\* During the first months of the 11<sup>th</sup> grade.

An important explanation for the relatively high age of the Bachelor students lies in the fact that many of the students were employed before studying. Only 34% started at university in the year after graduating from school; 66% started their studies later. In the meantime, the respondents had been employed in different professional or educational surroundings, respectively:

- 24% army, community or voluntary service etc.
- 11% practical placements;
- 23% have terminated another study programme without graduation (15 male, 4 female students);
- 16% have been employed before starting their studies;
- 11% students have started a professional education, of these three students without certificate.

A further question to the students was related to the information sources about the study programme. Most of the students (27%) retrieved the respective information from the internet, followed by friends (17%), family (15%), forest staff (11%), Info Days at the university (11%); employment centre (6%), student advisory service (4%); information at school (4%). Other sources were indicated with 5%.

Professional aims and the estimation of action towards this professional aim are covered in this survey by the questions of pursued academic degree, clear ideas about the professional aim and the choice of modules in the study programme. Asked about which academic degree they pursue, half of the students (Figure 7) indicated that they aim at a master degree, 22% prefer a Bachelor degree, 16% imagine continuing studies for a PhD later. Still, 12% did not have clear ideas at the time of the survey. Many of the students (70%) do not have clear perceptions how the professional aim could look like. Only 15% indicated a clear orientation: seven students aimed at becoming forest rangers, two students would like to work as a head of a forestry district.

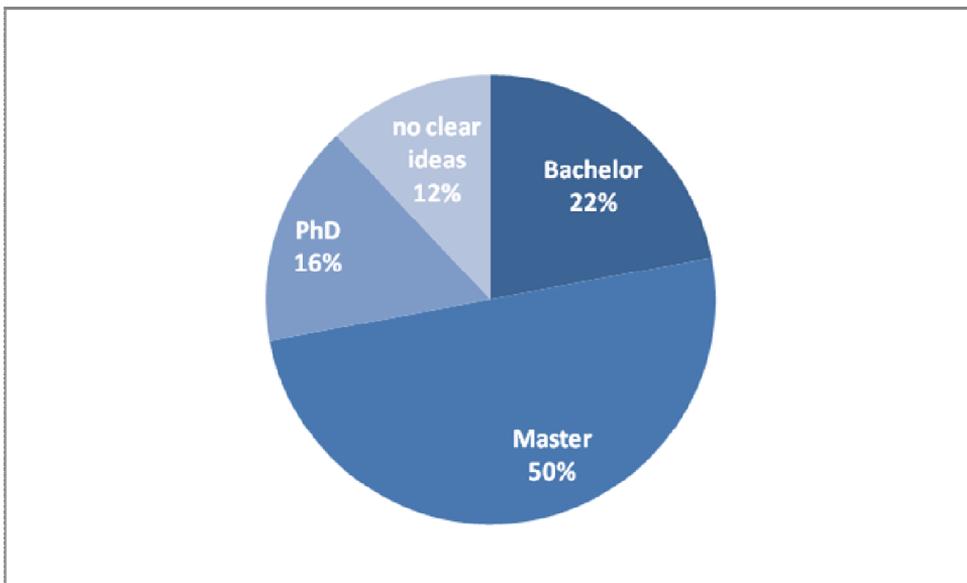


Figure 7: Academic degree pursued by BSc students (n = 88).

As pursued fields of profession, an employment in the forest service is still very attractive for the students. Alternatively, 54% of the students could imagine working with environmental problems. This is followed by a preference for science, the forest industries or politics with a similar share of about 30%. The pursued fields of profession differ by gender (Figure 8). While female students show a higher preference for environmental issues, male students are in favour of classical forestry professions.

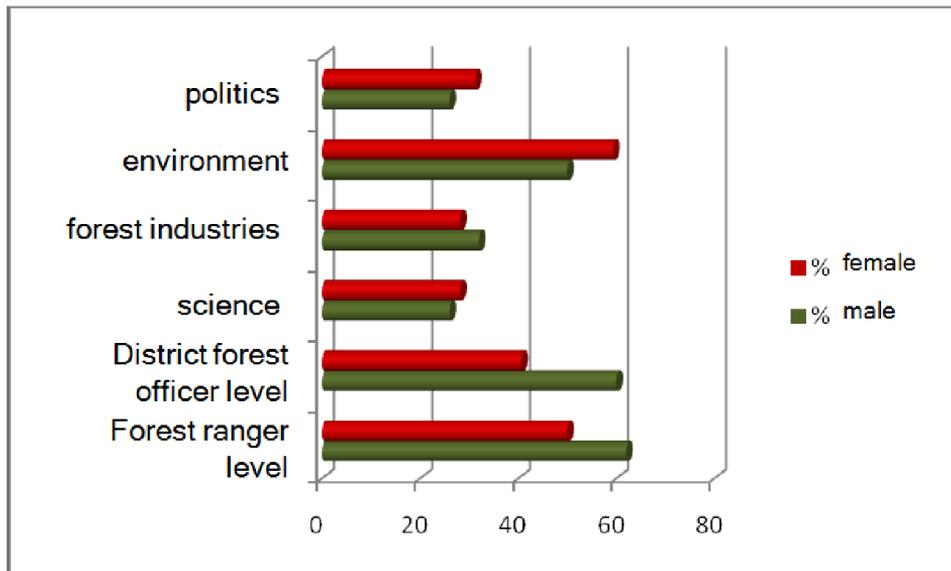


Figure 8: Pursued field of profession, differentiated by gender (in %; n = 88).

At least to a certain extent, the selection of modules mirrors the professional aims. While a general interest in the respective modules is a motivation for more than 70% of the students, in excess of 40% mention the “intended professional aim” as an important motivation. About one fifth of the students just want to pass or are even aiming at “at much free time as possible”. More than 10% confess that their selection is oriented towards the lowest possible input.

Students are proposing several measures how to improve the starting phase of studies (Figure 9).

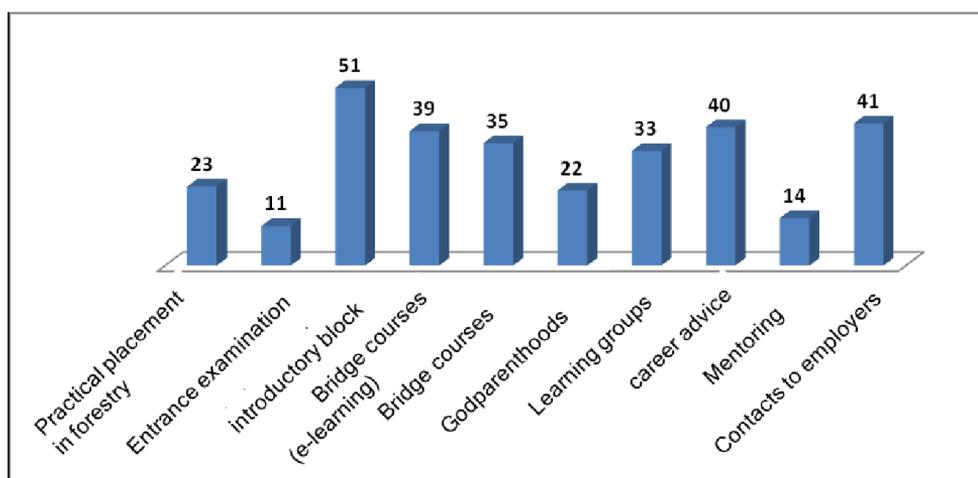


Figure 9: Measures to improve the start of the studies from students' point of view (in %; n = 88).

## Discussion and conclusions

Although recognized as a high-ranking issue in actual higher education policy, the concept of ‘ability to study’ is not easy to seize. According to Kazemzadeh *et al.* (1987), for three reasons it is very difficult to define criteria referring to this, which are verifiable in an empirical way. Firstly, these criteria dispose of a normative character. Secondly, study programmes constitute processes of learning, with the consequence that non-existing knowledge at the beginning of the programme does not mean it cannot be successfully finished. Thirdly, the problem of generalisation of requirements is not solved by just adding single requirements. Notwithstanding, educational research and policy have developed criteria for assessing competences and skills of the students.

The results reported in this paper may not generally be transferable, neither for other study programmes nor in differing political and social contexts. Rather, they constitute a snap-shot of the situation of the actual cohort of first-year students at the TU Dresden aiming at a Bachelor degree in forestry. This puts into perspective the low motivation for performance that seems to be problematic at first sight. However, as experience shows, at the end of the studies there is a sufficient number of highly performing graduates available who changed their motivation at a later stage of their studies. In addition, some of the results might mirror aspects of social desirability, e. g. when students have been asked about motivations for studying or when preferences for the selection of single modules have been assessed. Some of the findings are reminding to similar experiences in other study programmes. One of those is, above others, an increasing gap between the expectations of students and lecturers of what students should be able to know and perform at the beginning of their studies.

Students of the Bachelor programme in forest sciences at TU Dresden do have different backgrounds. This is true for their individuality as well as the social groups they are originating from. One important reason for the different state of education lies in the federal structures of education in Germany, providing the “Länder” (sub-national level) with a high degree of autonomy. In general, the grades of the university entrance degree follow a typical Gaussian distribution. German, English, mathematics are available on basic course level while deficits are obvious in chemistry, biology, and physics. Hence, 41% of the students do not feel well prepared for studying after school.

This finding is embedded in general dilemmas of Bachelor education. Firstly, in comparison to former Diploma programmes the available time for teaching and learning is more restricted. Former extensive forestry curricula had to be reduced to six semesters with “a strong reduction in the content of basic subjects or the need to cancel them” (Viehwegh, 2013: 8). Consequently, time for introductory courses showing students ‘how to study’ is very limited. Secondly, the realisation of the

proposals for solution is limited by the decreasing number of full-time employed teaching staff and financial means available, respectively.

In any case, the results of our survey provide valuable insights and helpful suggestions for the next reform of the Bachelor programme in forest sciences at the Technische Universität Dresden.

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# **FROM TEACHING TO LEARNING: WHEN WILL WE TAKE IT SERIOUSLY IN FOREST SCIENCES EDUCATION? SOME STUDENTS' PERSPECTIVES**

**MAGDALENA LACKNER AND MELANIE SCHULTE**

## **Abstract**

The demands on forestry and education have changed during the last decades. Students are required to have a wider knowledge about forestry and related sciences. The teaching system has to face these changes and to adapt the courses. Furthermore, students want their voices to be heard in this changing process. This happens via evaluations curricula and study courses. But not only teachers and students should be involved, also the voices of future employers have to be included in this discussion.

Key words: forestry education, evaluation, lectures, teachers, students, employers

## **Introduction**

The education system in forestry is really diverse. Some curricula have their focus on practical experience, some of them emphasis theory. But are students content with their lectures and do they have possibilities to give feedback for improvement? These questions are major issues of discussion in the International Forestry Students' Association (IFSA) due to its involvement in processes concerning forestry education. This is also shown in IFSA's implementation of an active Forestry Education Commission.

In order to proceed in analyzing these topics a survey was carried out among students of two different universities. The participating students are enrolled in two different universities, at the "Technische Universität München" (TUM, Munich – Germany) and "University of Natural Resources and Life Sciences" (BOKU, Vienna – Austria). The TUM students all attended the fifth semester of the Bachelor programme in "Forest science and resource management". This programme takes six semesters in general with a predetermined schedule of lectures in the first four semesters. During the last two semesters students can select at least two courses out of ten, for example "international forestry" besides the mandatory lectures. The students from BOKU participating in the survey were enrolled in a Bachelor programme as well. The Bachelor of Science in forestry called "Forstwirtschaft" is a programme of six semesters with a mostly predetermined schedule of lectures.

## **Method and materials**

The interviewed students gave answers to following questions:

- What do students expect from lectures?
- How can students help to improve lectures?
- Do students answer evaluations regularly?
- Do the students think that the teacher will implement this feedback?
- How to improve the evaluation system?
- What do future employers expect from students?

A total of 23 out of approximately 100 students, including four students of BOKU volunteered to take part in this opinion poll after they were told that this survey will be used to present the students' perspectives at the SILVA Network conference 2013. Every student received a paper with six questions to be answered handwritten.

## **Results**

Students expect a lot from the lectures themselves as well as from the lecturers. The presentation of the topics should be lively including highlighted key points and a good structure. But the main concern is the teacher. In the students' view the teacher should be well prepared, motivated and interested in what he or she is talking about. Also basic rhetoric knowledge is requested. Furthermore the teacher should be self-confident implicating to speak loudly and clearly and not to repeat sentences on the slides. Most of the students would like to have a link to recent research results and also significant take home messages are very important for them.

So what can be done to provide efficient and sustainable learning? The students' answers addressed the following topics:

- Improved schedules which should include more practical links;
- Lecture should be online at least one day before the lecture starts;
- Most important contents should be repeated;
- More group work, interactions and discussions;
- Links to other lectures;
- More graded assignments.

The demands on students are quite high. It comes to the question, if they are willing to help to improve the teaching and learning system. Many universities apply an evaluation system to learn about students' opinions. But the results of this survey show that contributing to this evaluation system is not very popular among students. Mostly because they think nothing will change when they evaluate courses in this way. When asking the students about improving the system they answered with following points:

- More frequent evaluations;
- Publish results (ranking);

- Negative feedback will lead to initiatives;
- No online evaluation;
- To teach students the importance of evaluation system.

The courses during the studies should lead to confident graduates. Therefore the students were asked what they think future employers would expect of them. Following main points were quoted:

- Working independently and in teams;
- Knowledge in specific fields;
- Practical experience;
- Motivation and interest;
- Studied/ lived abroad;
- Soft/transferable skills;
- Ambition;
- Reliability.

### **Conclusion**

An active participation of students in the process of improving the teaching qualities is required. As future professionals it is the responsibility of students to raise their voice and to take the chance to engage themselves in this process. The ways in which students can contribute to change the lectures and teaching systems for the better have to be evaluated and improved. But not only the teachers and the students should be included in the process of reforming the schedules, lectures and the way of teaching, the future employers have to be integrated too.

## **STRUGGLING WITH LEARNING OUTCOMES IN INTEGRATED PRACTICE COURSES IN SPAIN. AN ESSAY ON HOW TO RENEW TEACHING-LEARNING (AND IMPROVE IT BY ONGOING MONITORING)**

**CRISTINA VEGA-GARCIA, FRANCISCA SANTIVERI, CARMEN IGLESIAS-RODRIGUEZ, LUIS SERRANO AND JORGE ALCAZAR**

### **Abstract**

In 2008 the Spanish Government established a new organisation of educational degrees, in Bachelor and Master-level programmes, aiming at the conformation to the EHEA in a convergence process initiated after the Bologna Declaration. A Royal Decree was followed by Legal Orders from the Ministry of Education establishing regulations to set competences to be acquired, or learning outcomes, and contents in degrees with professional qualification.

When new study plans were approved at the Agrifood and Forestry Science and Engineering School of Lleida in 2009, special courses of integrated practice were formulated. The courses of 6 ECTS credits each are compulsory in the first, second and third year of the Bachelor programme, as part of the new focus on practical training in Forest Engineering.

These integrated practice courses were to be developed with substantial time in the field and they were devoted to: a basic regional environmental study (1<sup>st</sup> year), a watershed scale study (2<sup>nd</sup> year) and a forest management plan (3<sup>rd</sup> year). These practical courses were to take place after students completed all related topics, at the end of each academic year.

Expected learning outcomes of these project-based learning courses were ambitious and manifold, including some related to field work design and implementation, group work, inter-personal skills, oral communication and presentation skills, and capacity-building in the assessment and management of forest resources at different scales and for multiple-use forestry.

We discuss here the limited experience available on the development and achievement of learning outcomes of these courses so far, as they embodied our main effort in the teaching-to-learning shift implicit in the Bologna process adopted in Lleida.

Keywords: forestry education, integrated practice courses, course learning outcomes, course evaluation, course coordination.

## Introduction

The Government of Spain established in 2008 a new organisation in Bachelor and Master-level programmes aiming to converge them with the European Higher Education Area (EHEA). The Royal Decree establishing the new structure was followed by Orders from the Ministry of Education regulating degrees that would provide official professional qualifications for the graduates, and particularly for engineering degrees, including Forest Engineering. As Forest Engineering is a regulated profession in Spain, the study programmes in all universities (García Robredo, 2013) must conform to directives set in the Order CIN/324/2009 for competences/skills to be acquired, learning outcomes, and contents. The Agrifood and Forestry Science and Engineering School of Lleida reformed its study programmes in 2009 moving from a 3+2 year scheme to a 4+1/1.5/2 year structure (BSc and MSc).

The Order CIN/324/2009 established that Forest Engineer Bachelors would have a 240 ECTS credit load and 4 years of duration. The study programmes must have a 60 ECTS credit load in common engineering contents, 60 ECTS credits in general forest engineering topics, 48 ECTS credits for forest engineering courses and a final degree project of 12 ECTS credits. The remaining 60 ECTS credits may be distributed by the universities/faculties at liberty between those blocks and/or electives.

The Agrifood and Forestry Science and Engineering School of Lleida approved a 60 ECTS credits load in common engineering contents, 87 ECTS credits in general forest engineering topics, 51 ECTS credits in specific forest engineering technologies, 24 ECTS in electives, 6 ECTS credits in a compulsory placement and a final degree project of 12 ECTS credits (Vega-García and Alcázar, 2014). The goal of this new study programme was to allow for specialization, early contact with the job market, and integrative learning through three compulsory practical courses named Integrated Practice I, II and III, devoted to hands-on experience and overarching application of theoretical and applied contents from previous courses within a group-work context. These integrated practice courses, of 6 ECTS credits each, were to be developed with substantial time in the field and a project-based learning approach (Mills and Treagust, 2003; Dochy *et al.*, 2003) focused on:

- Basic regional environmental study (1st year);
- A watershed scale study (2nd year);
- A forest management plan (3rd year).

Temporally, these practical courses were to take place after students completed all related topics, at the end of each academic year. A main goal was to prevent that students viewed the study programme as a compilation of unrelated and self-contained courses (as they generally do), and interiorised the links between transversal and specific learning outcomes in a joint professional project.

Expected learning outcomes of these project-based learning courses were ambitious and manifold, including some related to field work design and implementation, group work in a more complex environment than usual (as forest administrations and many instructors were involved), inter-personal skills, oral communication and presentation skills, and capacity-building in the assessment and management of forest resources at different scales and for multiple-use forestry, promoting the ability to solve problems in the real world (Brown, 2003).

### **Description of integrated practice courses**

The core of Integrated Practice I, II and III is hands-on practical group-work encompassing:

- A phase of preparation and documentation of the study case;
- Field work in the forest;
- Data analysis and diagnosis;
- Presentation of the decision-making process and the results in professional formats.

Each course has as many instructors as required by the disciplines it integrates, but a general coordinator is in charge of logistics, sequential coordination and general development of the course, and guiding evaluation of achievement rates for learning outcomes.

Integrated Practice I (IP-I) is a basic regional environmental study belonging to the general forest engineering block of contents and skills, and relates to botany, zoology, ecology, climatology & meteorology, soil science and geology. Resumed learning outcomes (examples out of 18) are:

- To know the main physiological processes of plants and the influence of ecological factors on them;
- To know the more relevant aspects of animal and vegetal biology, as well as the main factors of their distribution;
- To know the zoological and botanical basics, as well as the essential contents of morphology and systematization that allow to differentiating models of organisation, diversity and complexity;
- Identify the different physical and biotic elements of the natural environment and their interrelations;
- Understand and analyze interactions between the ecological factors that allow determining the structural and functional properties of ecosystems and forests, as well as their spatial-temporal organisation;
- Understand the importance and ecological value of the different physical and biotic elements of the natural environment;
- Use and apply methods for an ecological characterization of a region, and common methods in vegetal eco-physiology;
- Draft technical reports/documents, manuscripts, professional assessments and characterizations.

In this course nine teachers participate organizing the course with 20% classroom work and 80% field work, with evaluations based on a diagnostic descriptive written report of the area and also defended orally.

Integrated Practice II (IP-II) is a watershed scale study identifying disturbances and/or degradation processes and formulating directives for restoration at watershed and fluvial channels scale. It belongs to the general forest engineering block of contents and skills, and relates to Topography, GIS & Remote sensing, Hydraulics, Forest Hydrology, Engineering and Reforestation, summing up to 23 general competences and 32 specific competences, resumed in:

- Capacity to carry out an integrated diagnostics of a watershed, identifying disturbances and/or processes of degradation of the natural environment, and formulating guidelines for restoration;
- Capacity to design, project and execute infrastructure and engineering work required for forest and environmental management;
- Capacity to develop and apply defensive techniques and rehabilitation of degraded natural systems: natural hazards and risk evaluation, hydrological and vegetation restoration, rehabilitation of degraded areas.

The course is given by a group of eight teachers balancing computer labs with field work (20h/20h) with the remaining classroom time (20h) in small-group guided work. The evaluation is based on one written report on physical environment constraints, computed discharges and soil losses, and a choice of one of three project types: a forest road project, a reforestation or a small dam design professional project.

Integrated Practice III (IP-III) is a forest management & planning exercise. It is taken after completing courses on Forest health, Fire science, Wildlife management, Forest inventory & mensuration, Silviculture, Forest management and Forest harvesting. It belongs to the specific forest engineering block of contents and skills, and lists 20 forestry specific competences, by which students are expected to:

- Quantify and inventory natural resources;
- Evaluate potential forest products, uses and services;
- Design budgets and apply economic principles to forest management;
- Manage/cope with forest health issues or other disturbances (fire) within strict demands for biodiversity conservation;
- Plan for silvicultural treatments and regeneration action within a sustainable, adaptive and participatory framework.

The forest planning integrated course is assigned to twelve teachers who balance a few lectures, several computer labs, field work, and small-group guided work (forest goal specific). Evaluation is based on several deliverables ending with an oral presentation proposing a forest plan for a certain aim: wood or non-wood products, game, conservation, recreation, landscape, water, mining, and any other

environmental services, followed by a debate. Agreement between the groups representing different interests is not always possible, but role-playing for stakeholders views is emphasized.

### **Monitoring of the learning process**

The starting point is the analysis of the learning plan for the corresponding course, which must be made public before the start of the course every year (and even before registration in the course), including the scheduling of all activities of any typology, goals, skills to be acquired, evaluation tasks, instructors, timetables and locations. Students may access this information through the virtual campus platform (SAKAI) of the university. The Office for Quality (oQua-UdL) is responsible for generally controlling the process and the development of the Learning Plan.

The Office for Quality (oQua-UdL) also gives support for the collection and digital processing of success/fail/drop-out data, grades and feedback from the students through written questionnaires composed of eleven questions on the course, nine on each teacher, and a free comments field. Questionnaires are presented to the students in their classrooms for each course, after most academic activities are completed but before final evaluation takes place. Teachers are informed in advance and requested not to be present. They and the Coordinator receive the general course evaluation and their individual results a few weeks after, through a Data Warehouse they can access in SAKAI. However, only the averaged results across all teachers and the averaged results for the course are made public to the university community. Coordinators' reports incorporating these annual results and proposals for improvements are the key factors in this ongoing process.

Given the relatively short time passed since approval of the Forest Engineer study programme, these integrated practice courses have been given only four times (IP-I), three times (IP-II), and two times (IP-III) respectively, so only limited data is available. However, they are relevant for the analysis of the degree of achievement in the initial implementation of these – for us innovative - integrated practical courses.

### **Some implications about outcomes of the integrated practice courses**

These courses confer a distinctive trait to the education students receive, unique within the Agrifood and Forestry Science and Engineering School. This strategy of close interaction between theoretical contents and practice connects directly with future professional demands, stimulates self-sufficiency, inventiveness, versatility and other values in agreement with the Bologna goals (Iglesias-Rodríguez *et al.*, 2011). It has been found to raise motivation not only of students but also of the instructors, and their focusing more on applied skills useful for the labour market. The weight is heavy on the evaluation of skills important for the changing, competitive and increasingly global job market (group work, inter-personal skills,

oral communication and presentation skills). These skills should be an asset for employability when combined with the more traditional forestry skills.

The complexity of the integrated practice courses increases from the first to the third, which should help to build knowledge and skills starting from basic environmental diagnosis to concrete, integrative and sustainable forest management at a high resolution scale. As the output of the courses follows a format related to real professional projects, the potential for after-graduation professional mismatch is hopefully reduced (*sensu* Rekola and Lautanen, 2015).

Students are always receptive to practice; their good response to these IP courses and to the methodology used makes them successful in terms of grades: success rates in passing are between 92 and 100 %. Questionnaires are filled in higher percentage (41-96%) than for other regular courses in the forestry programme (26-49%).

Project-based learning methods are applied in all IP courses; teachers jointly select forest areas nearby the university, to provide students with challenging study cases. Familiarity with the forest environment is another valued trait of IP courses, as it demonstrates the absolute requirement to have a good knowledge of the study-case area, acquired through frequent activities with different instructors and professionals working in regional forest administrations (i.e. the provincial government-Diputació de Lleida in IP-I; Poblet PEIN Forest Administration in IP-III).

As for challenges found in the course implementation, coordination has been singled out as the most difficult task. The coordination of activities, schedules, instructors and evaluations relies on one teacher who has other tasks as well, and who is responsible for a complex management involving other instructors also not exclusively dedicated to these courses. At least, the instructors are always responsible for related courses that can be imparted previously (ideally) or simultaneously (not optimal) to IP courses. The general planning requirements in the school play a role here. Execution of the Learning Plan may be affected, and usually is, by these external constraints. Questionnaires from the first implementation years remark this weakness, which shows some improvement in following years, but still requires work.

Another critical factor is the budget. Adequate knowledge of the forest environment gained through time in the field is a requirement for project-based learning, and the nearest forest area worth visiting is at least 40 km away from the School. Coordinators complain that the resources allocated by the School are insufficient to cover all trips they would like to organize, but the current financial situation has generated budget cuts up to 50%, unavoidably affecting these activities.

Students' free comments in questionnaires suggest students have many difficulties with the integration of contents and results of activities on their own, even in IP-III during the third year of the study programme. This currently requires more tutoring than accounted for when the courses were first planned. For IP-III a specialist has been designated and assigned as tutor for each working group of three students, elaborating a given forest goal. This has triggered a wider awareness in the instructors about what their colleagues expect and how the disciplines must interact in linked assignments, but also complaints for the extra effort it implies. An expanding, and beneficial, effect on the courses preceding IP courses in terms of coordination for contents and activities is quite noticeable after four years.

However, a perception that these courses are "too much work" and the demands are superior to those in common courses is shared both by teachers and students. A trend to decrease the initially high number of deliverables to a reasonable level for a 6 ECTS credit load has been observed during the past few years of implementation.

Comments in questionnaires filled by students also indicate that they are aware of the experimental nature of these courses in Lleida ("we are lab rats"), and that improved information on course goals for integration of knowledge, skills to be gained and evaluation requirements need to be refined and conveyed properly to decrease criticism by a part of the students.

Given that IP courses embodied our main effort in the teaching-to-learning shift implicit to the Bologna process as adopted in Lleida, results of the first few years' questionnaires, around 3 out of 5 points for the courses (2.64-3.24 in range) and 3.5 out of 5 for the instructors (3.23-3.80 in range), could be seen as initially disappointing. The scientific analysis of specific answers to specific questions in questionnaires, beyond the bulk average publicly provided for course and teachers, is currently prevented by the university policy that keeps private the individual results for teachers. However, as years pass, the experience gained is reflecting in student satisfaction and the increasing quality of the courses' outputs.

### **Conclusions**

As Forest Engineering is a regulated profession in Spain, the study programmes in all universities must conform to common directives set by the Ministry of Education. The Agrifood and Forestry Science and Engineering School of Lleida included in addition three integrated practice courses, of 6 ECTS credits each, to be developed with substantial time in the field and a project-based learning approach within a group-work context. These courses embodied the main effort in the teaching-to-learning shift implicit in the Bologna process adopted in Lleida.

Experience in the first few years of implementation suggests that the approach stimulates self-sufficiency, inventiveness, versatility and other values in agreement with the Bologna goals and helps develop applied skills, useful for the labour

market, which should be an asset for employability when combined with the more traditional forestry skills. Integrated courses raise motivation also for the instructors and have triggered better collaboration on the courses preceding them, in an expanding effect over the rest of the study programme.

Pitfalls are budget, as the courses are expensive to run, and the extra effort required for coordination and tutorial work. Success rates are good but there is much room for improvement on student satisfaction.

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## **BACHELOR STUDENTS' MOBILITY: SUGGESTIONS FOR IMPROVEMENT**

**GERHARD MÜLLER-STARCK, MARTIN DÖLLERER, THOMAS SCHNEIDER**

### **Abstract**

The Bologna Declaration induced the Bachelor and the Master degree and thus opened the door for a new dimension of student mobility. By choosing another university for their upcoming MSc curriculum, BSc graduates can easily supplement their education and gain more specific qualifications.

In contrast, the student mobility within BSc programmes still is inadequate. The main problem arises from the lacking acknowledgement of course achievements from abroad in spite of the fact that various European guidelines exist which are well designed to promote student mobility. European higher education institutions still seem to neglect the necessary cooperation. Consequently, students who want to follow mobility recommendations of the European Commission risk an involuntary prolongation of their studies in case they want to spend a term abroad. The Erasmus Programme tries to bridge such problems but this does not help all those students who cannot participate in this programme.

As an example, mobility of forest science students at the Technische Universität München, Germany, is analysed. Appropriate tools for the improvement of student mobility are structural modifications of the BSc curriculum, execution of learning agreements, verification of external course achievements by an authorised transcript of records, and more flexible recognition practices. The cooperation between higher education institutions needs to be improved in order to avoid prolongation of the BSc study time.

Keywords: Student mobility, learning agreement, transcript of record, recognition of qualifications, transnational education, BSc

### **Background**

The re-structuring of academic curricula, particularly the establishment of the Bachelor and Master degree (BSc, MSc) as standard degrees, and the European Credit Transfer and Accumulation System (ECTS) became the most significant impacts of the Bologna Declaration (1999). The corresponding subdivision of higher education (HE), i.e. the replacement of Diploma curricula by two consecutive academic degrees, opened a new dimension of student mobility because it is not necessary to study a BSc and a MSc programme at one and the same

university. Consequently, various opportunities became available to supplement the BSc degree acquired by a MSc degree abroad and thus to gain more specific qualifications.

This new category of student mobility, however, was followed by a decreasing mobility within the BSc programmes: In most cases, BSc curricula were not established as an own independent HE category but derived from the former Diploma. The reduction of the study period by at least one year tended to increase workloads considerably so that curricula started suffering from compacting and regimentation. In contrast to Diploma curricula, the share of elective subjects within BSc programmes diminished so that chances to set individual priorities became more restricted than before. Student mobility decreased because students risked an involuntary prolongation of their studies in case they wanted to follow the EU recommendations by spending a term abroad (for cases of unsatisfactory student mobility, see Ziesak and Müller-Starck, 2014). The ERASMUS Programme tries to bridge problems in the recognition of external course achievements but nevertheless, prolongation of study periods in many cases cannot be avoided. Moreover, free movers do not benefit from such programmes.

### **Guidelines to facilitate student mobility in Europe**

The standard for the recognition of external course achievements in Europe is the „Lisbon Recognition Convention (1997, in force February 1999), officially designated as the Convention on the Recognition of Qualifications concerning Higher Education in the European Region (see LRC, s.a.<sup>5</sup>): Generally, the possibility for students to study abroad has been acknowledged as an essential element of European integration: “Foreign qualifications shall be recognised unless there is a substantial difference between the foreign qualification for which recognition is sought and the corresponding qualification of the host country”.

Supported by the European Commission, DG Education and Culture, the European Student Information Bureau (ESIB) has carried out the project “Transnational Education (TNE) – Fostering Access or Generating Exclusion?”. As an outcome of this project, based on the terminology of UNESCO-CEPES (the European Centre for Higher Education/*Centre Européen pour l'Enseignement Supérieur*) and the Council of Europe, the ESIB European Student Handbook on Transnational Education (s.a.) was edited in 2003. The ESIB Handbook provides a substitute for national higher education systems. It is an extension of the Lisbon Recognition Convention which does not explicitly address this strict form of transnational education. The ESIB Handbook deals with a global market of higher education, it supplies new expectations for higher education institutions, it offers new forms of transnational learning including e-learning, and it addresses problems, opportunities and regulations via ECTS, quality assurance and accreditation.

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<sup>5</sup> s.a.= *sine anno*, no year indicated.

As a result of the European Area of Recognition (EAR) Project, in January 2012 the European Area of Recognition Manual (s.a.) was compiled by the DG Education and Culture, edited by the Netherlands organisation for international cooperation in higher education (Nuffic). The subtitle “Practical guidelines for fair recognition of qualifications” clearly indicates that this compendium supplies the tools for daily recognition work. It contains standards and guidelines on all aspects of recognition of foreign qualifications and helps to make relevant procedures transparent to anybody who is involved. This manual contributes essentially to a joint recognition platform of higher education, so that European countries are able to practice a similar procedure in the recognition of qualifications which is based on commonly agreed guidelines.

Parallel to the activities of the EAR project, the ERASMUS Student Network edited the guidelines Successful Recognition – Student Guidebook (2011) by which rights and obligations of students are clearly addressed and standard forms for the Learning Agreement (compulsory) and the Transcript of Records are supplied (s.a.).

As a consequence of European guidelines and recommendations, the basic condition for student mobility has been improved considerably:

- There are specified obligations of the universities (home and abroad); e.g. they carry the burden of the proof in case they intend to reject the recognition of external course achievements.
- The legal position of the students is defined, e.g. they have the right to enter an objection against a decision of the university.
- There are well defined obligations of the students, e.g. via learning agreement and verification of external course achievements by means of an authorised transcript of records.
- In practice, the to-do list for the stay abroad follows a simple time scale:
  - Before: Learning agreement, check on the transfer system of grades.
  - During: Deviations need to be communicated to the home university.
  - After: Claim for recognition of course achievements from abroad.

Transnational education is specific in the sense that it exceeds the standard duration of one term and follows more specific regulations which depend on the respective bilateral or multilateral agreements between institutions or countries, respectively.

As an example for mobility targets for the future, the Mobility Strategy 2020 for the European Higher Education Area (EHEA) was formulated by the EHEA Ministerial Conference “Mobility for Better Learning”, held 2012 in Bucharest (s.a.). This guideline reinforces the Leuven/Louvain-la-Neuve Communiqué (s.a.), in which the EHEA Ministerial Conference has formulated a mobility target that in 2020 at least 20% of those graduating in the EHEA should have had a study or training period abroad (topic 18). Measures for implementation at institutional, national or

European level shall be undertaken. The Bologna Follow-up Group is requested to report on progress at the next ministerial conference in 2015.

### **Student mobility exemplified at the national level**

In Germany, the Lisbon Recognition Convention was ratified in 2007 but it took further five years until the corresponding guidelines were issued in a draft version (December 5th, 2012) which is considered as the major tool in the realization of student mobility in Germany: “*Leitfaden zur Anerkennung im Ausland erbrachter Studien- und Prüfungsleistungen (s.a.)* [English: Guidelines for the recognition of results from studies and exams in foreign countries].

This version still is under discussion, e.g. during the meeting *Studentische Mobilität Fördern! Herausforderungen und Chancen der Anerkennungspraxis an Hochschulen (Juli 2, 2013, Berlin)*, sponsored by the Hochschulrektorenkonferenz.

Major topics of these guidelines are:

- The Lisbon Recognition Convention is the basic recognition norm.
- Student mobility is greatly acknowledged (e.g. because of cultural benefits, international relationships).
- Recognition of course achievements does not require a one-to-one congruency.
- Benefits for the continuation of the respective curriculum and a flexible configuration are of relevance.
- Recognition is formally established, information and support is assured.
- There are central contact points which facilitate recognition procedures for students.
- Learning agreements and mobility windows help to realise recognition.
- Quality management of curricula is a significant element of both, the home university and the hosting university abroad.

Subsequently, cases and options for improvement are pointed out with respect to the Technische Universität München (TUM), which support student mobility within both BSc and MSc curricula (in addition to ERASMUS grants):

- The PROMOS (s.a.) programme offers grants to German students for up to six months with inclusion of research oriented stays and internships. Generally, PROMOS focuses students who do not participate in existing programmes such as the ERASMUS Programme. Grants are limited (€ 300 each month support by Deutscher Akademischer Austauschdienst (DAAD)).
- The TUMexchange (s.a.) programme addresses universities outside of the European Union in the following countries: Argentina, Australia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Cuba, India, Indonesia, Israel, Japan, Malaysia, Mexico, Morocco, New Zealand, Philippines, Russia, Singapore, South Africa, South Korea, Taiwan, Thailand, USA. Enrolment fee is waived in most cases. Duration is one or two terms; financial support depends on the respective exchange regulations

For forest science study programmes, the following steps are compulsory for ERASMUS students and strongly recommended for free movers (the most common mobility model is to study one term abroad):

- Learning agreement for outgoing students which contains details of the proposed studies abroad (programme with ECTS based list of subjects).
- Differences compared the study programmes at the home university need to be pointed out clearly.
- During the stay changes compared with the learning agreement need to be communicated.
- Recognition of course achievements from abroad by the home university. In case of uncertainties, the local examination board will pass a decision. It carries the burden of the proof if it intends to reject the recognition. In cases of recognition of foreign degrees, an executive for the approval of foreign degrees is responsible.

ERASMUS students (outgoing and incoming) are advised by contact persons. During the consultation work done by the authors, which is related to curricula in the fields of forest sciences, the following problems were the most significant ones:

- The planning period of one year or longer in advance appears to be too long.
- Lecture periods are not harmonised across Europe so that often problems with examinations occur.

The survey presented in Table 1 illustrates low numbers of outgoing students in contrast to the incoming ones (a total of 21 versus 44 students). The ERASMUS Programme is the dominating source of student mobility but the portion of students outside of this programme has increased during the past two years.

Table 1. Numbers of outgoing and incoming students for BSc and MSc curricula in forest science.

Year	outgoing students		incoming students	
	ERASMUS	OTHER	ERASMUS	OTHER
2011	3	0	11	0
2012	4	0	7	3
2013	5	2	5	3
2014	5	2	9	6

During 2011-2014, the most frequently chosen universities among outgoing students were: University of Madrid, Spain (4 students), University of Eastern Finland, Finland (3 students) and SLU, Sweden (2 students). Other higher institutions were selected by only one student respectively, e.g. Agrotech Paris (France), ETH Zurich (Switzerland), University of Leuven (Belgium), University of Padua (Italy).

In order to improve student mobility within the BSc curriculum Forest Science and Resource Management, the structure has been modified with respect to the sixth term, starting with the winter term 2012/2013. This final term now consists of an

internship (10 ECTS), a Bachelor's thesis (10 ECTS), a project (5 ECTS) and elective courses (5 ECTS).

All these elements can be achieved abroad so that the door is open for student mobility without involuntary prolongation of the BSc curriculum. The increase of the numbers of outgoing students (14 in 2013-2014 as compared to 7 in 2011-2012) primarily responds to the recent modification of the BSc curriculum.

Anyway, the portion of outgoing students from the BSc and the MSc curricula in the fields of forest science still is very low. During the period 2011-2014, on average, only five students per year moved to another higher education institution for one term. Taking into account that this annual value stands for all students within the BSc and the MSc curricula, the portion of outgoing students is approximately 2%. Without the promoting effects of the well reputed International Forestry Students' Association (IFSA, s.a.), this portion might have been considerably lower. The communication between students and the faculty officer for international student affairs revealed that the observed mobility deficit is not so much a question of lack of information but of the expected involuntary prolongation of studies in case students want to spend a term abroad. Extended consultation, closer contact among lecturers and students with inclusion of those students who experienced studies abroad, are expected to remove prepossessions and to increase student mobility. In any case there is no doubt that the current rate of mobility is far behind the target of the above cited Mobility Strategy 2020 which is aiming for at least 20% of the graduating students to have a study or training period abroad.

### **Concluding remarks**

The political frame conditions for student mobility have been improved considerably. Starting with the Lisbon Recognition Convention and the Bologna Declaration, an array of European guidelines offers platforms for the realisation of student mobility. Anyway, the reality deviates considerably from expectations, i.e. the degree of student mobility aimed at is by far not achieved.

To live in a foreign country and to meet people from various countries certainly is a highly valuable experience. This point of view is commonly accepted and, for instance, underlined by the increasingly demanded attention to the activities of the International Forestry Students' Association. The structuring of higher education in BSc and MSc curricula principally opened the door to a new dimension of student mobility, but particularly for the BSc curricula, it led to restrictions and is now counteracting the EU mobility targets such as the Mobility Strategy 2020.

The ERASMUS Programme is an essential support for trying to compensate losses of flexibility regarding student mobility but the free movers do not yet benefit from the improvement. In general, a greater tolerance regarding the approval of external course achievements, particularly of those organised in modules, is required.

Instead of establishing a two-class-mobility, i.e. ERASMUS and other exchange programmes vs. free movers, it is necessary for all to execute learning agreements, to verify external course achievements by an authorised transcript of records, and to intensify institutional cooperation concerning recognition practices.

The main task is and will be to implement and to utilise existing European guidelines for the improvement of student mobility without an involuntary prolongation of the BSc studies.

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## **A NEW APPROACH TO INCLUDE UNIVERSITIES IN THE LIFE-LONG-LEARNING PROCESS: EXAMPLES FROM HAFL, SWITZERLAND**

**MARTIN ZIESAK, PATRIC BÜRGI AND ROBERT LEHMANN**

### **Abstract**

The idea of life-long learning is a quite prominent element in the Bologna process. Hence universities are requested to play an active role in implementation of life-long learning. Examples from Switzerland are addressed with main emphasis on HAFL. The presented cases are both “certificate education programmes”, which are meant exclusively for people who graduated some years ago and who are in an active employment relationship. The first example gives a brief overview for an agricultural life-long learning offer at HAFL, the second case describes a bit more in detail a forestry initiative. In general, these certificate education programmes are useful and attractive “vehicles” for universities to realise attractive life-long learning options for jobholders. Some key factors like structural success features, but also adapted learning and teaching types are described.

Keywords: Bologna process, life-long learning, certificate education programmes, forestry, agriculture.

### **Introduction**

The School of Agricultural, Forest and Food Sciences at Bern University of Applied Sciences (HAFL, Hochschule für Agrar-, Forst- und Lebensmittelwissenschaften) runs at its campus in Zollikofen three different study lines. These are Agriculture, Food science & management as well as Forestry. Out of these, forestry is the youngest discipline. This part was established in 2003. Besides a BSc programme (BSc Forestry) two MSc programmes are offered in forestry (MSc in Life Sciences – International Forest Management; MSc in Life Sciences – Regional Management in Mountain Areas). While all these programmes are typical consecutive university programmes additional educational offers exist, too. Of particular interest here are those programmes, which are addressed to people who have already job experiences and who still want to enhance their knowledge. This approach falls quite typically under the scope of “lifelong learning” initiatives.

The idea of lifelong learning is not new. However, it is interesting to notice, that it is also part of the Bologna process. In the Bologna process, ministers responsible for higher education in the 46 Bologna countries have met rotationally to measure progress and set priorities for action. Already back in the year 2001 minister meeting in Prague the topic of “lifelong learning” was recognised as an important

part for the European Higher Education Area (EHEA). Since then the awareness for this topic has risen and efforts were undertaken to embed it actively in the development process. So in the meetings, Leuven / Louvain-la-Neuve, April 2009 (Leuven/Louvain-la-Neuve Communiqué, 2009), and Bucharest, April 2012, the final communiqués addressed this topic. The Leuven communiqué highlights the general importance of LLL, emphasises the role of involved groups, where in particular also ‘higher education institutions’ are included, and finally requests the embedding into national contexts (see Box 1). In parallel the European University Association (EUA) presented the “European Universities’ Charter on Lifelong Learning” (EUA, 2008), which was developed on request of the French Prime Minister. In ten statements active commitments from the universities for lifelong learning are requested. Among others it is said, that universities should “embed concepts of widening access and lifelong learning in their institutional strategies” (statement 1), “adapting study programmes to ensure that they are designed to widen participation and attract returning adult learner” (statement 3) and even “act as role models of lifelong learning institutions” (statement 10).

**Box 1 Extract from Leuven/Louvain-la-Neuve Communiqué, 2009**

Lifelong learning

10. Widening participation shall also be achieved through lifelong learning as an integral part of our education systems. Lifelong learning is subject to the principle of public responsibility. The accessibility, quality of provision and transparency of information shall be assured. Lifelong learning involves obtaining qualifications, extending knowledge and understanding, gaining new skills and competences or enriching personal growth. Lifelong learning implies that qualifications may be obtained through flexible learning paths, including part-time studies, as well as work-based routes.

11. The implementation of lifelong learning policies requires strong partnerships between public authorities, higher education institutions, students, employers and employees. The European Universities’ Charter on Lifelong Learning, developed by the European University Association, provides a useful input for defining such partnerships. Successful policies for lifelong learning will include basic principles and procedures for recognition of prior learning on the basis of learning outcomes regardless of whether the knowledge, skills and competences were acquired through formal, non-formal, or informal learning paths. Lifelong learning will be supported by adequate organisational structures and funding. Lifelong learning encouraged by national policies should inform the practice of higher education institutions.

12. The development of national qualifications frameworks is an important step towards the implementation of lifelong learning. We aim at having them implemented and prepared for self-certification against the overarching Qualifications Framework for the European Higher Education Area by 2012. This will require continued coordination at the level of the EHEA and with the European Qualifications Framework for Lifelong Learning. Within national contexts, intermediate qualifications within the first cycle can be a means of widening access to higher education.

In Switzerland there exist four, currently well accepted programmes for further education, which are often used under the scope of lifelong learning. These are the CAS (*Certificate of Advanced Studies*), DAS (*Diploma of Advanced Studies*), MAS (*Master of Advanced Studies*) and finally the EMBA (*Executive Master of Advanced Studies in Business Administration*). The main difference between these is the number of ECTS credits which need to be passed for graduation. With the rising number of minimum requested credits from only 10 in a CAS over 30 in a

DAS, to 60 in the MAS the necessary time for concluding these programmes is increasing.

Based on this overarching Bologna strategy, incorporating the mentioned Swiss educational programmes HAFL is dedicated to take an active and leading role in the lifelong learning initiative in its relevant disciplines.

As a prominent element the CAS programmes, as they are implemented at HAFL, deserve a particular mentioning. It is in particular these programmes, which offer a much wider and more intensive learning programme than short term oriented courses (like day courses, seminars, symposia or similar). On the other hand they are still compact enough in contrast to the more extensive DAS, MAS or EMBA programmes.

### **Exemplary CAS programmes description**

In the field of agriculture several CAS programmes are or were offered at HAFL. These are as follows:

- Equigarde® Plus (covers the topic horses);
- Soil mapping;
- Regional development;
- Coaching for actors in rural areas.

The last element in this enumeration, the CAS on “Coaching for actors in rural areas”, is the youngest HAFL offer. It targets as attendees professionals with activities in a rural area, who are working with people facing complex situations. The admission is open for attendees, who are

- Holding a higher degree (University, University of Applied Sciences) or a comparable training programme level;
- Having at least three years of professional experience and finally;
- Having access to practical coaching applications during their training time.

Table 1 shows all main modules and the volume of the teaching activities, respectively the work load for the participants, in this CAS programme. Based on the typical calculation figures, such as indicated in EU (2009), one full time study year with two semesters can cover usually 60 ECTS units, which represent a workload of up to 1800 hours; when one credit is matching a workload of 25 to 30 hours of work. At HAFL the assumed workload for one ECTS credits is seen at 30 hours, so that our CAS with a little over 10 credits would have a minimum workload well beyond 300 hours.

Table 6: Contents of CAS programme „Coaching for actors in rural areas“.

<b>Module</b>	<b>Content</b>	<b>Duration</b>
Module 1	Potential workshop: Introduction to the basis of coaching, customer needs, training situations	2 days
Module 2	Concept of course of action related to coaching, objectives, agreements and strategic planning	3 days
Module 3	Analysis, diagnosis, learning and organizational context	3 days
Module 4	Problem-solving, decision and conflict work as well as emotions in coaching	3 days
Module 5	Learning coaching Every participant works as a coach with a customer	2 days
Module 6	Future, vision and resources work in coaching	3 days
Module 7	Evaluation and conclusion in coaching processes, project presentations	3 days
	Individual coaching, project work, final examination	12 days
	Plus peer group and self-study time	
Total work load		360 hours

In forestry, HAFL offers a CAS in “Forestry management”. The course offers the latest know-how for forest managers in the areas of forest production, management, forest economics and policy, organisation and reorganisation.

It has a work load of 320 hours, consists of 13 mandatory modules (156 hours work load), five elective modules (60 hours work load) and two major excursions (topic: harvesting in mountain areas, management; 14 hours work load). A final thesis counting for a work load of 90 hours concludes the programme. For every module a separate final exam has to be passed. Lessons are organised at the end of the week (Friday 6 hours, Saturday 6 hours), so that neither working nor private respectively family life for the participants is disturbed too much. The whole programme is stretched out over a 14 months period, with eleven months dedicated to teaching and three months being reserved for the thesis. The tuition fee of CHF 8,900 covers the admission to all courses, all hand-out documents, the overnight fees (from Friday to Saturday) and the meals.

### **Implementation and outcomes**

The organisational concept with one teaching day in the official working time (Friday) and the other day during the usually free time (Saturday) proved to be attractive. It turned out, that set-ups with employers covering the expenses for the missed Friday from their work and employees contributing a day of the weekend were realised quite often. Up to now the course have been run four times, a total number of 59 CAS course participants (46 German speaking, 13 French speaking) were graduated.

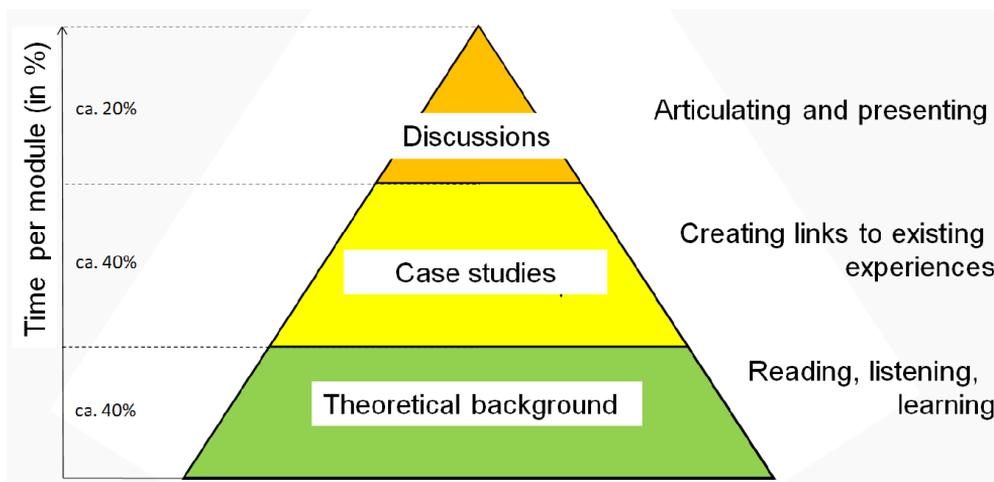


Figure 1: Didactical approach.

The fact that participants typically are not young, learning-trained students, but experienced, “best-aged” professionals with a high level of every-day work experience needs to be reflected in the didactical approach. As shown in Figure 1 a substantial time window is given for creating links to existing experiences. Additionally there exists a clear and precise schedule regulation (seven lessons per day; six hours for preparatory and subsequent work); learning material (such as reading lists, hand outs) is prepared and distributed before the courses; the regulations for exams are precise and clear and finally the participants’ voice is actively included through module evaluations for a permanent improvement to the clients’ needs.

The experiences from the programme are quite positive. The courses did turn out to be a catalytic element in the career development for several participants. For the university it turned out, that this active integration of professionals created a closer link to that clientele, which usually isn’t that closely linked to the university any more.

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# **CHANGES IN THE FORESTRY LABOUR MARKET AND THE EFFECTS ON CURRICULUM DEVELOPMENT AT WAGENINGEN UNIVERSITY**

**SILVIA BLOK, GERRIT EPEMA AND PIETER SCHMIDT**

## **Abstract**

Forestry as a profession in the Netherlands developed due to scientific and societal changes since the start around 1880 till now, 2014. These developments have been major drivers influencing the set-up of the forestry education at Wageningen University and its predecessors, next to changing ideas on academic education and national and EU education policy.

In the Netherlands KLV and Wageningen University have carried out job market research since 1973. One of the main motives of monitoring the job market's positions is to implement the results in education.

In this paper we present the main trends in forestry education and the outcome of the surveys of forestry graduates. Special emphasis is given to the present adaptations of the forestry programme and the role of alumni investigations in the process. It turned out, that the flexibility of the programme makes it possible to prepare students better for the changing job market, while keeping the high academic standards, and without changing the programme drastically.

Keywords: Forestry, nature management, graduate survey, curriculum development, education, competences, labour market, employability.

## **Introduction**

A very important reason to get educated is obtaining a paid job as the start of a career. This fact also counts for the alumni from Wageningen University (WU), in the Netherlands. Due to the permanent changes in the market, KLV (Royal Dutch Association for Agricultural Sciences; the WU alumni association) and WU have decided to set up a monitoring system in order to gain insight into the demands of the labour market for the alumni.

The question arises, how to implement these results in WU's study programmes. In this article the implementation is discussed on the basis of the Forest and Nature Conservation programme at WU.

After a short overview of both the history of the graduate surveys carried out by KLV, WU and others and the history of forestry education at WU, we will discuss some actual results of these surveys and the way the results are implemented in the study programmes, now and in the future.

### **KLV-WU Graduate surveys**

In the early 1970s KLV (the WU alumni association) and WU decided to set up a graduate survey due to the fact, that the unemployment figures rose sharply, and that both the job variety among Wageningen graduates and the number of curriculum specializations increased. In 1973, this survey was the first one carried out in the Dutch academic world, with a questionnaire, which could be used in following surveys too (Stichting MPW, 1976). Since then, the survey is repeated every five years for the complete body of MSc graduates at Wageningen University under the condition that they are still active in the labour market (not yet retired), with more or less the same questions, to which other, sometimes once-only, questions were added. In 2011 PhD graduates were included (KLV, 2013a).

The main reason to start these surveys was to evaluate the acceptance of WU graduates on the labour market. Answers to relevant questions can be formulated on basis of a survey among alumni (see Bakker Arkema, 1972; Bos-Boers and Schmidt, 2010; KLV, 2013a). Where do alumni find jobs and how can the market be served better? Are the expected jobs obtained, are unexpected jobs obtained? Are there many unemployed persons under the graduates? Are the competences of the graduates accepted in the market or should the curriculum be adapted?

The generated information is mainly used by KLV and WU. KLV uses it to inform its members about the labour market and to develop workshops to prepare its members for a better position on the labour market. WU study advisors use it to inform new enrolling students and to inform students when composing their own individual curriculum. Programme directors use it for visitations/accreditations of the programmes and – if necessary – to adapt the programme. Very important is that the information gives insight in the identity of the (Master) programme (Brown *et al.*, 2006; Scott and Lane, 2000), especially when measuring the competences and the connection of the programme to the labour market.

The graduates, of course, form the main source of information. The described graduate survey, which started in 1973, formed the basis. After that, other monitoring instruments are introduced. Nowadays, in 2014, data on WU alumni are collected in four ways:

- The *KLV/Wageningen University data base*: The alumni association KLV, in close cooperation with Wageningen University, keeps an enormous data base with all 40000 BSc, MSc and PhD graduates of Wageningen University. This database includes name, title, curriculum, address, email address, employer, and job. A lot of effort goes into keeping this database up-to-date. An up-to-date database is essential as a base for all surveys and all activities for alumni. This database which can be addressed and used at any moment, also gives some

latest information<sup>6</sup> of the labour market situation of specific groups of graduates.

- *The KLV/Wageningen University graduate survey career monitor, started as the above described first graduate survey:* KLV and Wageningen University carries out this survey every five years among the complete body of Wageningen University MSc graduates (not yet retired). During the years, the survey changed somewhat, but not of character. The content was adapted to the time: from Dutch only to bilingual Dutch and English, from open questions to multiple choice ones, and to the changed titles of the curricula and the title of the degrees. Moreover the sampling technique changed, from 100 % to only the since the previous survey new graduates and the old graduates, who answered the previous survey. For more details see Bos-Boers and Schmidt (2010) and KLV (2013). This approach was changed in 2011 again: All alumni with known e-mail address (about 60%) were sent an e-mail with a code (for privacy reasons), which they could use to fill in a digital questionnaire. Alumni without known e-mail address received a hardcopy of the questionnaire (see KLV, 2013a). In 1973 the response rate was high, 68%, which diminished over the years to 43% in 2006. According to Bos-Boers and Schmidt (2010) this had to do with the loss of the connection of the younger graduates with their alma mater. In 2011 the response rate was 26%. This low response rate may have been caused by the change in the approach, e.g. the use of a digital survey and the fact, that all alumni got a survey, also the ones without strong connection with the university. An acceptable distribution over all curricula was assured every survey by a check on representativity, of gender, study programme and nationality. Some graduates from certain curricula or with other characteristics got an extra reminder, and were added.
- *The MSc programme evaluation, set up by KLV as the “Rector Magnificus” (= Vice-chancellor) evaluation,* It is a survey among students shortly before, after or at graduation and evaluates the MSc-programme. Questions about their job positions are also included (Bos-Boers and Schmidt, 2010).
- *The WO Monitor, a questionnaire about scientific education (WO) held among recent MSc graduates of Dutch universities.* This questionnaire is set up by the Ministry of Education and gathers information among all graduates of Dutch universities one year after graduation with emphasis on evaluation of the education and monitoring their jobs.

### **Forestry curricula at Wageningen University**

Since its start in 1918 the predecessors of Wageningen University offered two Forestry curricula, one aimed at tropical forestry and one aimed at Dutch forestry. The latter one was till the Second World War of minor importance. Due to declining enrolment in the early 1950's and the loss of the labour market in Indonesia forestry education at WU was reformulated extensively in 1956. Two

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<sup>6</sup> Actuality depends partly on the speed with which graduates inform on changes.

three-cycle curricula of in total five and a half year (respective 1 year “propedeuse”, 2.5 years ” kandidaats” and 2 years “ingenieur”) forestry were established, one curriculum concentrating on ecological and silvicultural aspects and the other on economic and technical aspects. Both aimed at (state) forest enterprises. Specialisation in tropical or temperate regions was possible by selecting restricted choice<sup>7</sup> courses.

After the students’ protest movements in 1968, new curricula for WU were formulated in 1971. The propaedeutics were skipped and new four- or five-year curricula were established (among the latter was Forestry). Inside Forestry three specialisations (Silviculture, Forest Management and Forest Exploitation Technology) were offered. This was enlarged to five (Forest Policy, Forest Use, Forest Development, Forest Management and Forest Products) in 1982. From 1983 to 2000 also a two-year MSc curriculum Tropical Forestry was offered to students with a (Forestry) BSc degree from other (applied) universities. Moreover a special two-year curriculum was offered to graduates from Dutch Universities of Applied Sciences. See for more details Jansen and Schmidt (2006).

Due to decreasing enrolment and diminishing interest for forestry graduates on the labour market, the Programme Committee Forestry (ROC “Bosbouw”) decided in 1993 to abandon the pure forestry curriculum and offer a curriculum “Forest and Nature Conservation”, first in the old format of an “Ingenieur” (Ir) degree programme at MSc level, since 2000 (officially since 2002) in the format of a Dutch taught BSc degree programme (BSc Bos- en Natuurbeheer), followed by an English taught MSc degree programme (Forest and Nature Conservation). The BSc curriculum focused on management presently has two majors (Ecology & Conservation, and Policy & Society). The MSc curriculum has three curriculum specialisations (Ecology, Management, and Policy & Society), see for more details Boelee (1998); van Baren *et al.* (1998); van Baren (2004); Jacobs *et al.* (2004); Epema and den Ouden (2011). The official abbreviation for the MSc curriculum Forest and Nature Conservation is MFN. This abbreviation will be used below for all (also earlier) students in Forestry and in Forest and Nature management.

For the MFN education in Wageningen, till 2008 the labour market situation was of no real worry. The Dutch government funded the development and management of all kinds of nature areas and this resulted in enough employment possibilities in the Netherlands. Also the government financed these kinds of activities in developing countries, and as a result alumni found their jobs outside the Netherlands as well.

Since 2008, the economic situation worldwide and in the Netherlands changed. Due to this economic crisis the amount of money allotted to nature and forests in the Netherlands and the tropics diminished. Consequently, the number of available jobs diminished as well. In addition, retirement age has been raised and people have to

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<sup>7</sup> Students have to choose a number of courses from a given list.

work longer. Moreover, more alumni are starting on the labour market. All these factors make it more difficult and competitive for the freshly graduated to find a job (Wageningen World, 2014).

Another effect of the diminishing attention and funding for forest and nature conservation and management is the fact, that the intrinsic value of nature, which is addressed in ‘conservation and preservation’, became more and more under pressure, and had to compete with more instrumental functions for nature, like the increasing demand for sustainable energy (wood), the increasing demand for forests and nature for recreation (Bosschap, 2013) and the CO<sub>2</sub> sequestration problem.

All this resulted in more attention inside WU to strengthen the position of forest and nature conservation alumni. In 2013 the situation became urgent. Discussions about the needed skills and knowledge to get and maintain a job on this labour market are on-going in the programme committee “Forest and Nature Conservation”, while the first measures have been taken.

### **Reasons for change in forestry curricula at Wageningen University**

The first change, in the 1950s, was caused by the loss of a labour market in the former colonies. This had consequences for nearly all curricula at WU. Even without a graduate survey, it was clear, that something had to be done, quite simply because no jobs were available anymore and the focus was changed to European land use including forestry.

The second major change was the consequence of the student protest movement of 1968. The last author was personally involved in the – for the first time organised – discussions in 1969 and following years between teachers, alumni and students about the renewal of the curricula. The push for this curriculum revision came from the students, who pressured the Dutch government to act. And it was the government, who supplied the guidelines. The first KLV survey was launched in that period as well, in the early 1970s.

The third major revision was started, about 1993, with again the third author personally involved. Teachers saw the movement in the Dutch society and politics away from forestry, which became less important, towards nature management, the latter becoming more and more important. Moreover they perceived the consequences for the labour market and noticed the drop in the number of first-year students (see Figure 1). Hence, the Programme Committee (a curriculum education commission) for Forestry changed the name and the content of the Forestry curriculum into a Forest and Nature Conservation curriculum, with perhaps later on some informative support from graduate surveys.

The fourth major change, in 2000, was started by the European Council of Ministers of (Higher) Education with the Bologna Declaration. It was clearly politically

motivated with perhaps some thoughts about a Europe wide labour market for graduates and a larger exchange of students within Europe and between programmes. At WU, this proposal was well received. The BSc-MSc system resulted in more exchange and flexibility within and between universities in the Netherlands and Europe. This had a major influence for the graduates in forest and nature conservation, as was shown above. The BSc and MSc in Forest and Nature Conservation have different learning outcomes. Both programmes again deal with international and Dutch aspects of forest and nature conservation. But internationalisation has quite a different meaning than before.

The role of graduate surveys in these four major changes may have been minimal. How it is nowadays will be discussed below.

### Wageningen University Forestry graduates on the labour market

In the eighties and the first half of the nineties of the previous century, the influx of forestry students was relatively low (see Figure 1). This risk to the continuity of the forestry study programme led to discussions on the continuation or the change of the programme at different university levels. The reasons for maintaining forestry in any form were, that it was a programme with specific characteristics: a long and unique tradition in the Netherlands and important for sustainable management of large areas (long term thinking). The forestry chairs were able to convince the educative boards at WU and the Ministry of Education and a study programme Forest and Nature Conservation was developed and launched in 2000.

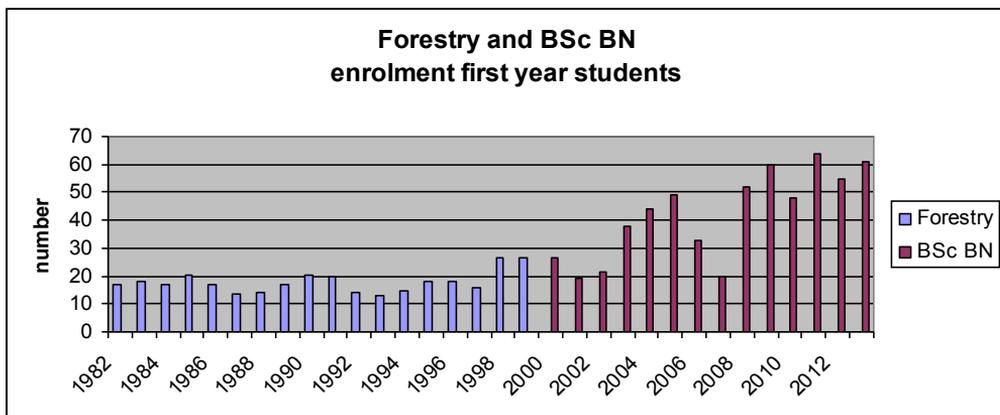


Figure 1: Enrolment of first-year students in the curriculum Forestry (N15 and L10) and the BSc Forest and Nature Conservation (BSc BN). Note that enrolment in the MSc Forest and nature Conservation is not measured here and that only students enrolled in these curricula are included, not in the curricula derived from these. Source: Jansen and Schmidt, 2006; WU, 2013.

The low number of students in 1987 and 1988 was a reaction to a change in publicity. In the early eighties many students enrolled in the forestry study

programme with other expectancy than was fulfilled. They arrived with a romantic sense of work in the field, and were faced with 'white-collar'-issues and features. In response to this, the public information about the forestry programme gave more and more a realistic view, and students, who want to work in the field, are referred to a more practical university of applied science (HBO) or senior secondary vocational education and training (MBO). The relatively low numbers of students in 2007 and 2008 are more difficult to explain and may possibly partly be related to a non-optimal publicity. In 2008 the policy of publicity was changed.

From the end of nineties, there was an increase of students' numbers. The small dip in 2001-2002 is an artefact, related to the administrative change from a 5 year programme (2000, 2001 2012) to a real BSc-MSc structure. In 2004, 2005 and 2006 numbers were high, followed by the already mentioned dip in 2007 and 2008. Since that time the number of enrolling first semester students fluctuated roughly between 50 and 60 a year.

The increasing numbers from 2009 onwards were seen in almost all WU study programmes, with the remark, that in some other programmes student numbers started to increase somewhat later and increased even more (biology, food technology related programmes, social sciences). The financial crisis (started in 2008) probably stimulated more high school graduates to enrol at WU in order to avoid the labour market.

Summarizing, first semester student numbers of BSc are nowadays around three times that of the starters in the eighties and nineties (60 versus 20).

The number of students entering the MSc Forest and Nature Conservation is even higher than the number of BSc students (Bos- en Natuurbeheer). From 2004-2008 the cohort size was around 60, from 2009-2014 around 80 with in 2010 and 2012 90 students. The population now roughly consists of one third of students from the WU BSc Bos- en Natuurbeheer, one third of international students and one third from other bachelor programmes in the Netherlands (mainly biology, environmental sciences, wildlife management and forest and nature management both from Dutch research universities and universities of applied sciences). The increase of numbers of international and Dutch MSc students with a non-Wageningen BSc is in line with other MSc programmes at WU. This implies that it can be expected, that in the coming years even more MSc students will graduate than students will enrol in the BSc Bos- and Natuurbeheer.

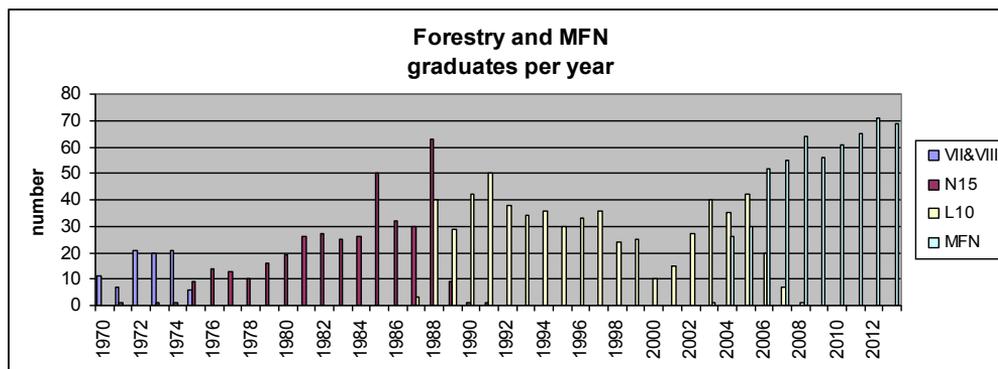


Figure 2: Number of Dutch and non-Dutch MFN graduates per year. Note that the forestry curricula VII and VIII ran from 1956 till 1975; the forestry curriculum N15 from 1975 till 1987; the forestry curriculum L10 from 1987 till 2003 and the forestry and nature conservation curriculum from 2003 till now. These numbers include also graduates from all curricula derived from the mentioned main ones. Source: Unpublished data KLV, derived from the KLV database, 2014.

In Figure 2 all graduates with an “ingenieur” diploma (1970-1987) and an MSc degree Forest and Nature Conservation (from 1987 onwards) are shown. All programmes are included in these data; a direct comparison with Figure 1 is hence difficult. The 1988 graduation peak is due to the necessity for the slow N15 students to graduate: that curriculum and its derivatives were cancelled at that moment. This peak was also present in most other WU curricula.

It can be expected, that the number of MFN graduates will be 60 or more over the coming years. Even if we correct the outflow figures for non-Dutch students leaving after graduation, it is still evident that more MFN graduates than before will enter the Dutch labour market. At the same time, as a result of the Dutch policy to delay the retirement age, it delayed the throughput on the labour market. For the time being, the economic situation is not so, that a recovery of the labour market can be expected. Due to the policy of allotting less money to forest and nature conservation the situation for the MFN graduates may be even worse.

The question arises, whether the current curriculum of the actual MFN programme, developed before this situation, is still optimal, or whether the curriculum should be adapted to insure this large group of graduates’ good possibilities on the labour market. In a few years from now, it is expected, that job possibilities will increase due to a combination of economic growth and the relatively high number of old employees in the sector. But even then, we have to take into consideration that competences needed for these jobs probably will change.

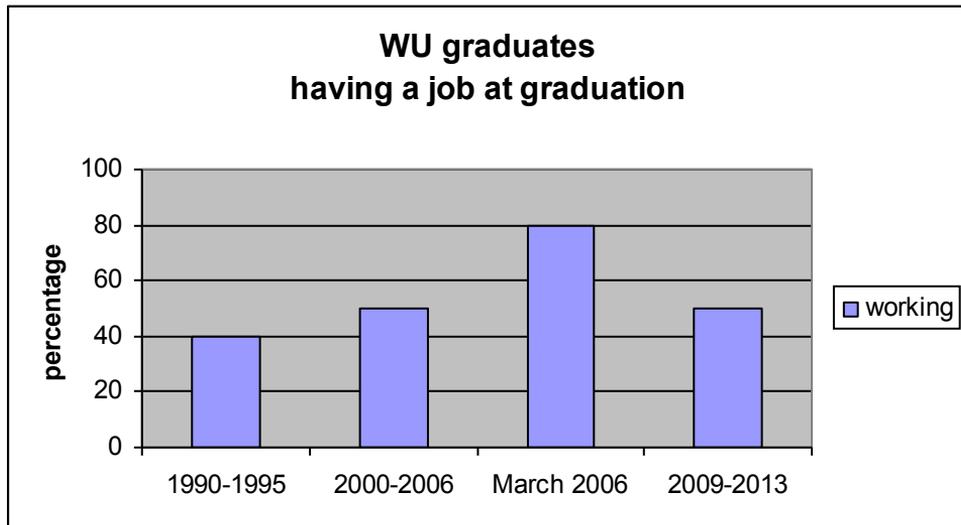


Figure 3: Percentage of WU graduates from all curricula with a job at graduation. Source: MSc programme evaluation KLV (2008-2014) and unpublished data by KLV/WU: Rector Magnificus enquête/MSc programme evaluation (1990-2007).

Figure 3 shows how the WU graduates are doing on the labour market at the time of graduation. Please note, this is an average, so it may fluctuate within the various years as is shown in March 2006 (see also KLV, 2013; Resource, March 2013; Resource, August 2013). But indeed the labour market for graduates in the years 2000-2013 seems better than in the nineties. These percentages for MFN graduates (Figure 5) are slightly lower than for WU graduates in general due to several reasons. The study advisers indicate that MFN students shortly before graduation focus on their study and graduation and do not yet bother with the labour market. After graduation the alumni start thinking about their future career. One reason is the labour market itself. In 2006 the labour market was good, i.e. it was easy to find a job. After this the financial crisis had a negative effect on the labour market. The average time between graduation and finding a job for MFN graduates is presently three to four months.

A general WU trend is that more and more graduates pursue a PhD after their Master. At the end of 2011, 20 percent of the Wageningen University alumni had obtained a PhD degree, 2 percent had started PhD research, but had stopped, and 6 percent were still working on a PhD project. Between 1970 and 2010 the percentage of alumni of Dutch origin, who completed a PhD or started PhD research outside the Netherlands rose from 8 to 22 percent (Mariën *et al.*, 2012). This trend is also in line with the already earlier (nineteen eighties) transformation of a management/practical-university to a more scientific/theoretical university and hence education (WU, 2012). For more details on the PhD study at Wageningen University see van Laar, 2014.

In line with the university trend also more MFN graduates, and also especially the non-Dutch, would like to enrol in a PhD programme than in the eighties or nineties, or indeed enrol. In Figures 4 and 5 some numbers are given for MFN. Numbers vary strongly from year to year and are difficult to estimate exactly due to the relative low response rate. The internationalisation of WU (WU, 2012) can be seen here too.

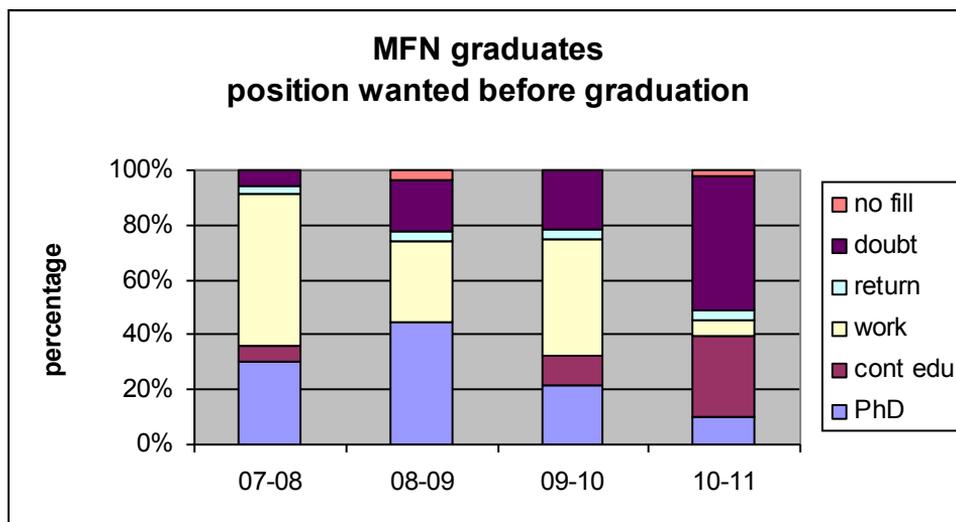


Figure 4: Percentage of MFN graduates, who – before graduation – want to work in a specific job. Legend: PhD: PhD; cont edu: continue in some education programme; work: permanent job; return: return to previous job; doubt: does not yet know; no fill: line not filled in. Source: Unpublished data by KLV/WU, derived from MSc-programme evaluation 2007-2011.

The percentages, ' jobless ' at the time of MFN graduation, and a year after graduation (Figure 6) are quite high. Around 10% of the MFN alumni have no job, while also quite a few (30 %) have a job below MSc graduate level. Accepting a function lower than MSc level may be partly explained by the fact, that employers try to place MSc graduates on a lower position, which is cheaper for them, partly by the fact, that the MFN graduates prefer working in a 'green' job both above being unemployed and working outside the 'green' environment. It is expected, that these graduates will obtain a better suited function/position/job in some years. This is confirmed by the data in Table 1: 69% of the MFN alumni from 2000 to 2011 are employed in a position, that requires at least an academic qualification, which conforms with the average of the WU graduates (71%).

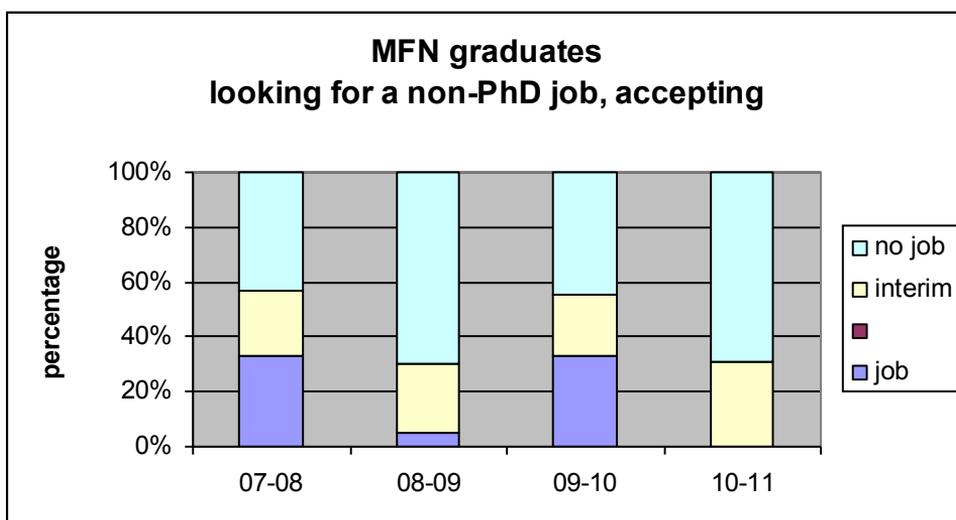
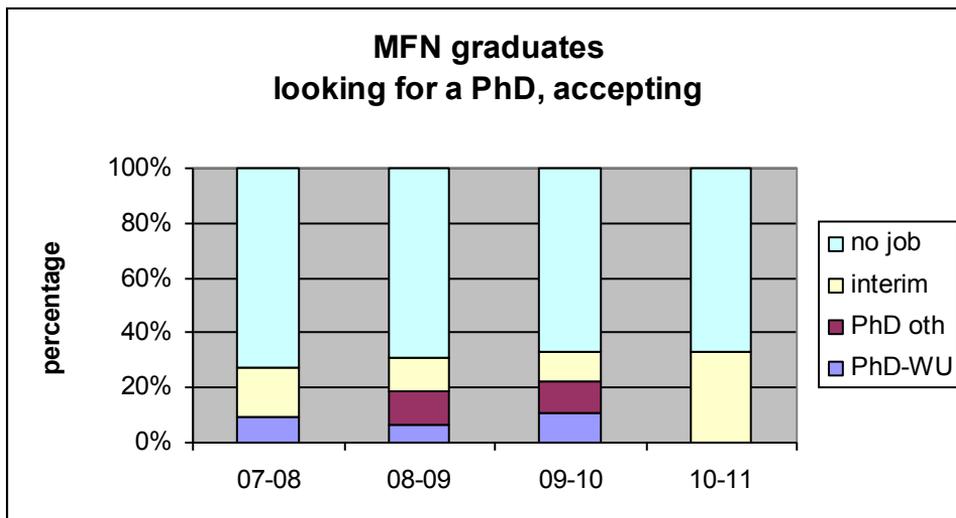


Figure 5: Percentage of MFN graduates who – after looking for a specific job (above PhD; below other) – were working at graduation. Legend: PhD: PhD at WU (Wageningen University, dark blue) or at another university (red); interim: temporary job; job: found a steady job; no job: did not found a job. Source: Unpublished data KLV/WU derived from MSc-programme evaluation, 2007-2011

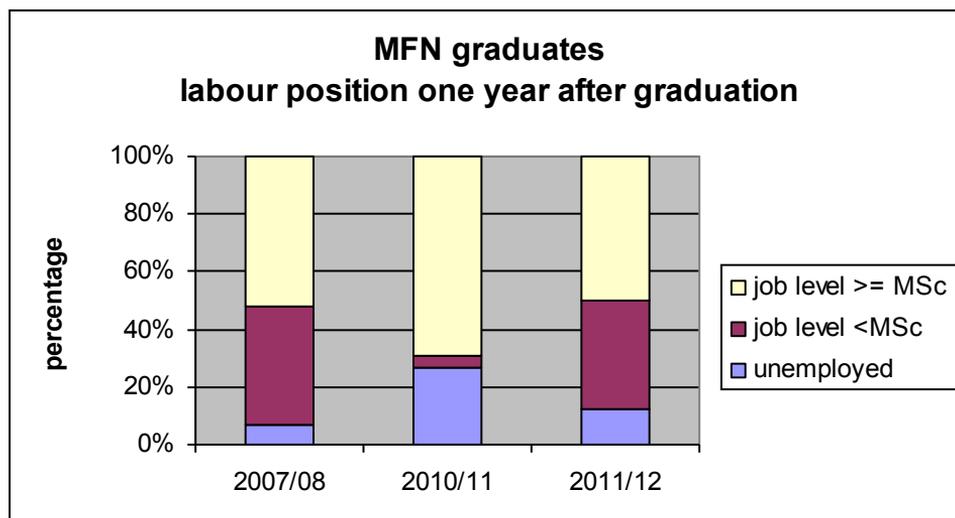


Figure 6: MFN graduates one year after graduation, who were unemployed and who were working in a position with a level lower or equal to and higher than MSc. Source: IVA, 2009; 2011; 2012; 2013.

Table 1: Minimum required level for the actual function/position/job for all and for MFN graduates from WU between 2000 and 2011. Source: Mariën *et al.*, 2012.

Required level	WU total		MFN	
	%	N	%	N
University plus PhD	12	123	9	6
University + postgraduate	4	41	3	2
University	55	558	57	40
Higher vocational	22	219	24	17
Vocational	2	21	0	0
High school	0	5	1	1
Unknown	4	37	6	4
Total	100	1,008	100	70

About 55% of MFN alumni, who graduated in 2011-2012, indicate that they are working in “their own field” (IVA, 2013). This may partly be caused by the interpretation, what “their own field” is: forest and nature or “green” in general. This is less than the average of 74% of all MSc graduates from WU and the average of all Dutch university graduates (72%), involved in the research (IVA, 2013). These data seem to differ from other surveys (Mariën *et al.*, 2012; see also Table 2), in which 87% of the MFN alumni and 80% of all graduates between 2000-2011 indicate, that they are working in their own field, while only 13% (MFN) or 20%

(WU) are working in another field. Differences in outcome between the different investigations have probably to do with the different methods (other groups, alumni of different years, other type of questions). The overall outcome seems to indicate, that present MFN graduates have more problems to find a job at their own level and in their own field than other WU graduates.

Table 2: Work field of WU graduates and MFN graduates. Source: Mariën *et al.*, 2012

Work field in relation to education	Total WU		MFN	
	%	N	%	N
Completely inside own education	12	123	13	9
Inside or related to own education	68	689	74	52
Completely different than education	6	59	0	0
No specific education required	14	137	13	9
Total	100	1,008	100	70

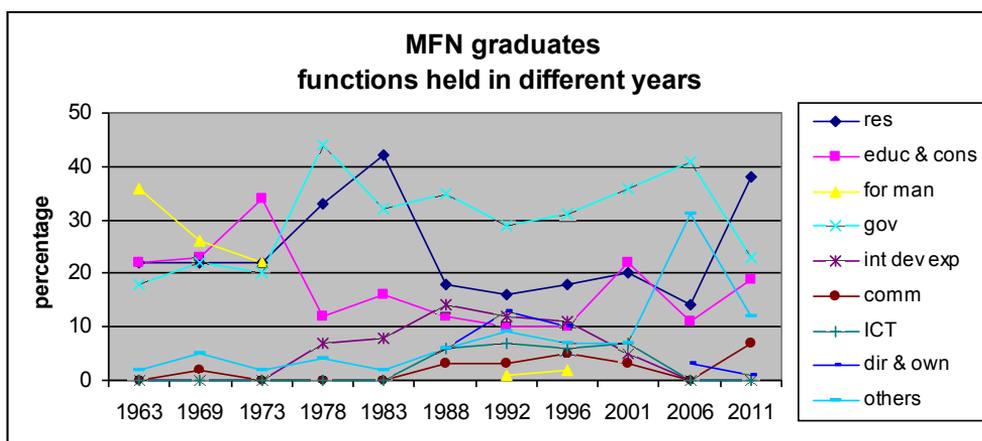


Figure 7: Functions/positions/jobs held by MFN graduates in the years between 1963 and 2011. Legend: res: research; educ & cons: education and consultancy; for man: forest management; gov: government, policy, management, director; int dev exp: international development expert; comm: commercial staff member; ICT: information and communication technologist; dir & own: executive and own company; others: others. Source: Unpublished data derived from KLV/WU career monitor 1973-2011.

The functions of MFN graduates show a great diversification, especially after 1983 (Figure 7). Again this raises the question: did the labour market change, did the graduates change or both? Government has been an important employer of MFN graduates, during the last 50 years (see Figure 8). Alumni work as policy maker, general manager or director. Forest management was an important employer in the

nineteen sixties and seventies, but was of no importance later, which for sure has been caused by a change in labour market. Research was an important employer of MFN graduated between 1975 and 1985 replacing forest management as most important employer, corresponding with the change of a management orientated curriculum to a research oriented one. After 2006, the number of alumni working in research functions rises again. Also here a more scientific oriented curriculum could be the cause for the change (WU, 2012). This corresponds with the trend of other WU MSc graduates. Mariën *et al.* (2012) stated: “43 percent of the Wageningen University alumni, who graduated less than five years ago, are employed in a research position at a university, research institution or industry. In the 2006 career survey this applied to just 29 percent of those, who had graduated less than five years before; a difference that can be attributed to the increasing number of alumni choosing to do a PhD.” Education and consultancy functions were important in the whole period, but probably with a shift from education to consultancy in the last ten years to alumni working in NGO’s and companies. In the last 30 years communication (no IT) functions made up 5-10% of the graduates’ jobs, but we expect, that communication aspects become more and more important in other functions like consultancy too.

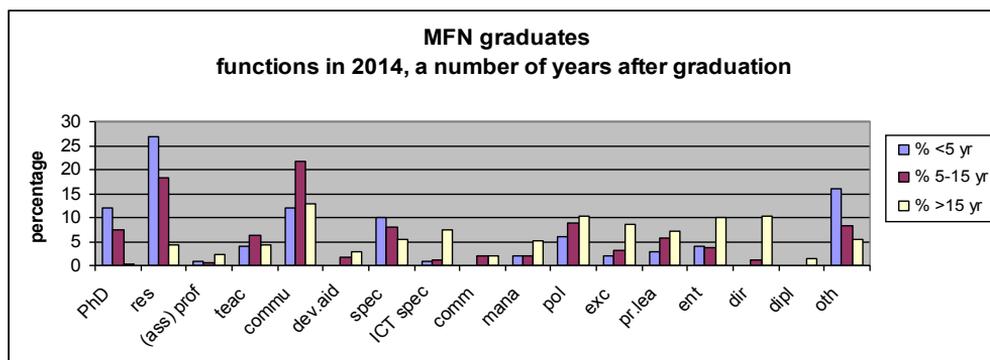


Figure 8: Functions held by MFN graduates in 2014, less than five, between five and fifteen and more than fifteen years after graduation. Legend: PhD: PhD researcher; res: researcher; (ass) prof: (associate) professor; teac: teacher; commu: information, reporter, advisor; dev.aid: development specialist; spec: professional specialist, designer; ICT spec: information, communication technology specialist; comm: commercial fellow; mana: manager, head; pol: policy fellow; exc: executive; pr.lea: project leader, head; ent: entrepreneur; dir: director; dipl: diplomat, chairman; oth: other functions. Source: Unpublished data KLV, derived from the KLV/WU database, 2014

The development of careers and functions of graduates is investigated by using the extensive KLV database (Figure 8 and 9). Recent graduates often obtain other functions than alumni, who graduated a longer time ago. The recent ones more often were PhD candidates or worked as researchers or technical specialists. Graduates further along in their careers often worked as consultants, directors,

policy officers or entrepreneurs. This is in line with the broad picture for WU graduates (KLV, 2012).

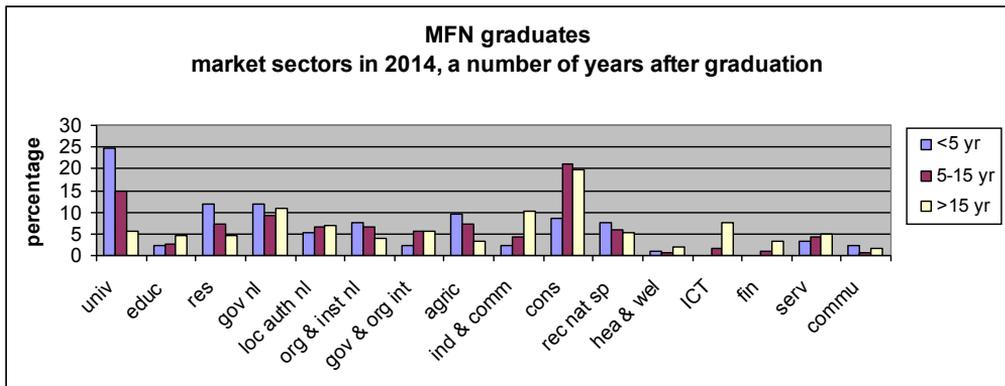


Figure 9: Organisations and market sectors in which MFN graduates are working in 2014, less than five, between five and fifteen and more than fifteen years after graduation. Legend: univ: universities; educ: education; res: research; gov nl: Dutch government; loc auth nl: Dutch local authorities; org & inst nl: Dutch organisations and institutions; gov & org int: non-Dutch governments and international organisations; agric: agricultural firms; ind & comm: industry and commerce; cons: consultancy firms; rec nat sp: recreation, nature conservation and sports; hea & wel: health and wellness; ICT: information and communication technology; fin: financial services; serv: other services; commu: public relations, communication, etc. Source: unpublished data KLV, derived from KLV/WU data base, 2014

Besides the individual development of 'growing' in a job, most alumni also continued to develop through their choice of employers. Recent graduates more often worked for a university, whereas less recent alumni are more often employed by engineering and consultancy agencies and also in information technology (IT). I. This last may be the result of a GIS specialization in the curriculum in the late 1990s. Of course, the demand from the market (many IT positions offered and only a few MFN positions) may play a role here, too. This is also shown in Figure 8.

Figure 10 indicates that both traditional and new means are used by the graduates to obtain a job. Networking (e.g. through internship, family, chair) is important, but even in 2011 reflecting on a job announcement is the most important means. Quite noteworthy is the fact, that there is no real trend: that a given mean is successful one year, is no guarantee for the next one.

According to the latest MSc programme evaluations conducted under the 2012-2013 alumni (KLV, 2013), the WU graduated found their jobs mostly through an internship (38% of the respondents with a job).

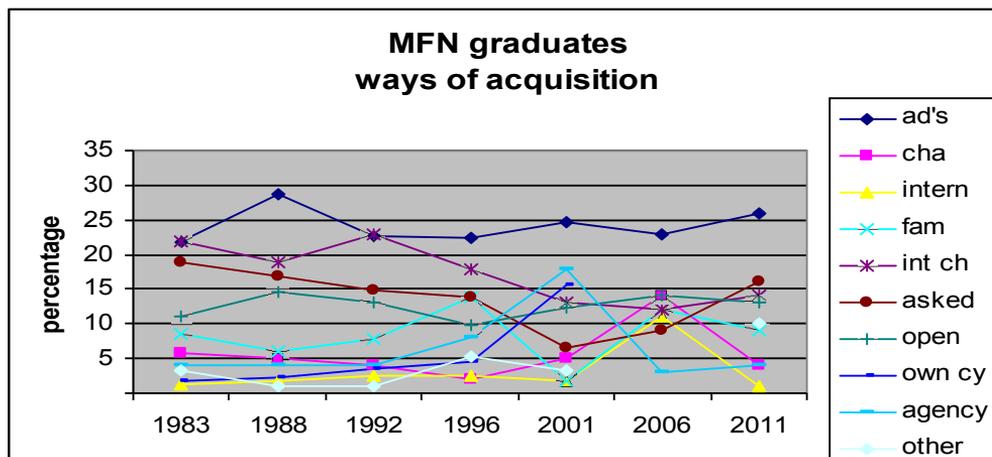


Figure 10: Acquisition means used by MFN graduates in different years. Legend: ad's: reflecting on an advertisement; cha: aided by the thesis'-chair; intern: internship; fam: aided by family or friends; int ch: internal promotion or change; asked: asked by employer; open: open application; own cy: own or parent's company; agency: employments office or firm, KLV, International Agricultural Centre or temping agency; other: other means. Source: Unpublished KLV data derived from KLV/WU career monitor 1983-2011.

One year after graduation, graduates are requested to indicate, if the requested level on a number of competences corresponds with the offered level. This inventory is made every year; in Table 3 the results for two years are given. More MFN graduates indicate in both years, that they are – according to their opinion – better educated than required for their jobs, concerning six competences. On the other hand for three competences (use of ICT, functioning under pressure and take decisions) alumni indicate, that the level they offer is less than the level required in their jobs. For other competences, the difference between required and offered ones is less.

Table 3: Mean required level (Req.) and mean offered level (Off.) of a number of competences for MFN graduates in 2011 (N=30) and 2012 (N=25). Column required indicates the mean level required for the function, the column offered indicates the mean level offered by the graduates on a scale of 1.0 = very low, 5.0 = very high. Both required and offered was scored by the graduates.

\* indicates that the mean offered level is two points or more lower than the required level;

\*\* indicates that the mean offered level is two points or more higher than the required level.

Source: IVA, 2012; 2013.

Competences	2011		2012		Competences	2011		2012	
	Req.	Off.	Req.	Off.		Req.	Off.	Req.	Off.
<i>Knowledge of ...</i>					<i>The ability to...</i>				
own discipline	3.1	3.6**	3.3	3.7**	reason logically	3.8	4.0**	4.3	4.0*
other disciplines	3.2	3.1	3.6	3.3*	work according budget, planning or directives	3.3	3.7**	3.6	3.8**
The ability to ...					functioning well under pressure	3.7	3.5*	3.8	3.6*
implement professional knowledge	3.4	3.6**	3.3	3.8**	make decisions	3.6	3.4*	3.7	3.4*
use information and communication technology	4.0	3.8*	3.9	3.6*	develop new ideas and solutions	3.7	3.6	4.0	3.6*
communicate in foreign languages	3.3	3.9**	3.6	3.9**	learn new issues	3.7	3.9**	4.4	4.2*
collect information	3.8	4.0**	4.2	4.1	make oneself clear to others	4.0	4.0	4.4	3.8*
spot problems and chances	3.7	3.8	3.9	3.7*	cooperate productively with others	3.8	4.1**	3.6	3.9**
make connections between different issues	3.8	3.9	4.1	3.8*	address the capabilities of others	3.5	3.6	3.2	3.4**
distinguish between main and minor issues	3.6	3.6	4.1	3.8*	work independently	4.2	3.9**	4.1	4.3**

According to Table 3 the current disciplinary knowledge is fine, even higher than required for the jobs according to the graduates. The high scores are in line with the excellent student evaluations, the opinion of the external advisory board and the recent official visitation judgement (NVAO, 2014). The knowledge of other disciplines is not significantly scoring too low, but this is a point to keep an eye on the next few years. Students have already the opportunity to specialise in other fields near to forest and nature conservation, but it may be questioned, if they select presently with a view to the job market.

The question is, whether the curriculum needs to be adapted in the light of these results and if yes, how? Students have already the opportunity to select courses to improve their knowledge, skills and competences in the three fields mentioned. A decision making course is part of one of the specialisations, but is not selected by all students in the curriculum. Should we advise to follow specific courses or should we make specific courses compulsory?

### **Changes in the Forest and Nature Conservation curriculum in 2015**

As discussed above, major changes in the WU Forestry curricula were caused by major events outside the university, by changes in society and politics. Because of the focus of the MSc programme on Forest and Nature management since the mid-1990s, the graduates were successful in finding jobs. However around 2008, the situation changed: numbers of job opportunities in general decreased, while at the same time the numbers of MSc graduates increased. The government funding for forest and nature management decreased drastically. Nature became more and more a market product. Various reports and studies describe how the role of forest and nature in society is changing (HCA, 2013; PACT, 2104; Schmidt and Lewark, 2014).

Links of nature management with other sectors like recreation, communication and sustainable water management become more important. Entrepreneurship and situational awareness are becoming in the last years required skills and competences. The changing role of citizens from only being consumers into being also producers and active managers has relevant consequences. The reports show also an increase in the competitiveness of our graduates with neighbouring fields, like biology, landscape planning or human geography, but even with less closely neighbouring fields, like law or marketing.

The WO-monitor 2012 and 2013 (IVA, 2012; 2013) and the career monitor (Mariën *et al.*, 2012) indicate, that most competences relevant at the start of the career (see Table 3) are sufficiently present in the programme. However, it will be important to find a balance between the old and newly required competences.

The overall set-up with half a year of free choice courses in the BSc and also a lot of free choice between courses and within courses in the MSc gives a lot of flexibility. In order to adapt to the new situation, the existing flexibility of the programme can be used and no new major change is required. The advantage of this approach is that both a BSc and MSc programme – judged very positively by students, graduates, external visitation and the external advisory board<sup>8</sup> – can be used as the basis. By keeping the balance between domain knowledge and

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<sup>8</sup> According to the QS World University Rankings by Subjects WU is the best European university for agriculture and forestry and the second one in the world (Anonymous, 2014). According to the prestigious “keuzegids”, a student based advisory book on study programmes in the Netherlands, the WU Forestry and Nature Managements are top-programmes.

competencies the same, students are both well prepared for the more traditional jobs and have a good base to operate successfully in new jobs. Three lines are presently being developed to prepare students to be more successful in these new jobs.

*Making students more aware of their own competences*

The first line is to make students more aware of their own competences and the choices they can make within the programme. For this line the study advice is adapted, special events are organised and some new elements are introduced. For the BSc a personal assessment module was developed to make students aware of their own qualities and to relate these to the choices within the BSc and MSc programmes. In the BSc programme these choices are located in the free choice courses and in the minor thesis; in the MSc programme these choices are located first of all in the choice of specialisation and the free choice courses. In addition career evenings are organised, where alumni, staff and KLV illustrate, how useful it is to develop your own network (see also Ziesak and Müller-Starck, 2010). Alumni reflect critically on their own choices during these evenings.

In the students advice it is stressed, that a good choice of an internship is vital for acquiring the right competences for a job. Hence, students with strong international ambitions are advised to look for international internships. Students with an ambition in Dutch jobs are advised to do their internship in the Netherlands. Nowadays about 30% of the all Wageningen alumni find a job directly related to their internship. In the MFN programme the present percentage is lower, partly due to a preference for interesting internships in developing countries, without good job opportunities. About 60% of the 2011-2012 graduates indicated, that they did an internship outside the Netherlands (IVA, 2013). Dutch students are still stimulated to gain international experience, even if they want a job in the Netherlands. They are advised to do this during their BSc study or for instance in the MSc thesis work.

The content of the BSc and MSc programmes and the many international students in the classes assure that students have enough experience with international aspects, a very important aspect too. Wageningen is aiming for an international classroom and international classes. In the study advice students are made aware of the possibilities to choose appropriate skills' training. The knowledge on forest and nature management is more and more combined with knowledge in other fields like recreation, communication, health (see PACT, 2014). In study advice and general meetings, the fields which can be combined with the domain of forest and nature, are indicated to give students inspiration for the selection of free choice courses in their BSc and MSc programmes. Besides, students are made aware of jobs outside the traditional fields of forest and nature. For example without the career evenings relatively few students turned out to be aware of the possibility to get a job in a company or to become an entrepreneur. It is stressed that they can follow their ambition to work in the "green" field, also by combining nature with other fields.

### *Minor changes in domain content*

The second line is to change the domain content of the BSc and MSc programmes a little. The general approach, that ecological, economic and social sciences are equally important for optimal conservation, protection and management of natural resources, is kept. Graduates have to be aware of all these aspects (also indicated by PACT, 2014 and HCA, 2013) and in addition to specialise in the field of policy and society, ecology or management. Through their academic training they know about theories of the ecology and biology of natural and semi-natural ecosystem and populations, and the social, economic and political forces, which ultimately lead to decisions in their use and management.

The programme committee decided to introduce a new course in the management specialisation dealing with resource dynamics and utilization. Ecosystem services and economics are also part of this course. After consultation of the external advisory board probably new adaptations will be discussed. This may lead to changes in the programmes, but also to a further change in study advice. In a constantly changing world the programme committee is constantly evaluating the curriculum of the BSc and MSc programmes to meet the state of the art academic standards and at the same time the needs of students and the labour market.

### *Develop learning lines*

The third line is to prepare graduates better for jobs by presenting ‘learning lines’, which are a specific combination of courses or choices within courses preparing for specific job types. The present general set-up will be kept. Students have to select a number of courses, depending on their specialisation and choice of thesis subject. Additionally all students have to do an internship of four months (24 credits), and a thesis of six months (36 credits). Furthermore they have to participate in so-called academic consultancy training, where they learn in an interdisciplinary group, to tackle a real world problem of a company or institution.

But the flexibility in the major parts of the programmes will be increased and specific free choice courses will be advised. By introducing learning lines the possibility for students to profile themselves more specifically is enhanced:

- Theoretical interested, excellent students, who intend to do a PhD after their MSc are allowed – after selection – to exchange the academic internship with a second thesis. They are also stimulated to follow a specific academic research training with, among others, an exercise in proposal writing for research grants.
- Students, who want to become entrepreneur or work as “entrepreneur” in a company may select a specific task during their academic consultancy training and follow a course on pursuing and realising entrepreneurial projects. The MSc study will become also a part of a European Education Programme on climate innovation (<http://www.climate-kic.org/>), in which entrepreneurship and climate are combined.
- The currently existing special track in diplomacy called sustainable development diplomacy will be promoted.

- A track focussing on information and communication technology will also be defined, because of the better job opportunities (IVA, 2013). In the free choice part of study students have the opportunity to choose GIS and remote sensing courses. If students are more than average interested in this field, they are advised to follow the WU MSc Geo-information Science, which can be combined with forest and nature elements.
- Moreover, students are advised to engage in specific courses in their free choice part of study. There are many high quality courses due to the presence of other MSc programmes (MSc communication science and MSc geo-information science) at WU and students are stimulated to select from these courses in their free choice part of study or to do two MSc's.

In the WO-monitor 2012 and 2013 (KLV, 2012, 2013 and IVA, 2012, 2013) and the career monitor (Mariën *et al.*, 2012) competences are indicated, which are relevant at the start of the career (see Table 3). Most are sufficiently present in the actual programmes. Three competency/skill-like topics seem to score lower than required. The “use of information and communication technology” can be tackled easily by the students by selecting the geo-information courses or communication courses. The competence “functioning well under pressure” and “making decisions” could be introduced as part of present course.

Concluding it can be said, that with the three lines of change mentioned above, it is expected, that the requirements of the traditional and new job market of forest and nature alumni can be met much better. Further discussions in the programme committee based on continuing graduate surveys and with the external advisory board will help to continue fine-tuning these and eventual other adaptations. However, the future is uncertain. On the one hand, job availability will increase due to the demographic situation on the labour market, many people retire, but on the other hand retirement age will rise. At the same time the general economic prospects are positive, but the financial attention for forest and nature management will not easily grow. In any case, the modifications presented above will improve the labour market position for students graduating from the WU MSc programme Forest and Nature Conservation.

## **Conclusions**

The study above shows, how changes in the forestry and nature labour market influenced the curriculum of the forest and nature programme. However, not all major changes are caused by the job market. One of the main questions, that the programme is facing, is whether the curriculum has to be changed in content or flexibility. Surveys on the job market turned out to be useful for the development of the programmes at the time of the major changes and especially for smaller adaptations in between the large changes. The start of the WU alumni survey was a result of a major change in job perspectives. The major role is that it gives specific information of the effect and requirements of programmes at the university level.

Presently the MSc programme Forest and Nature Conservation makes use of the results by improving the study advice, introduction of a new course and developing learning lines. Due to the flexibility of the programme students will be prepared better for the changing job market, while the high academic standards are kept.

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# PERCEPTIONS OF EMPLOYABILITY AND WORK-EDUCATION MATCH AMONG FORESTRY GRADUATES IN FINLAND

MIKA REKOLA AND EILA LAUTANEN

## Abstract

Education and working life are interlinked in many ways. This study measured the perceptions of employability and work-education match among forestry graduates in Finland. The focus related to employability was on working while studying and satisfaction with studies from the career point of view. Preliminary results from a survey (n=520) including academic foresters (MSc) and forest polytechnic engineers (BSc), graduated between the years 2000 and 2008, showed that working while studying had heterogeneous effects on the study length. Especially, according to the BSc students' perception, working improved learning and career prospects. Working while studying was also important for entering the labour market, since for the majority of the graduates the first job after graduation was the same as the one while studying. There was an overall satisfaction to education and its relationship to the labour market. From the point of view of quantitative matching the BSc graduates were under-educated and the MSc graduates over-educated. The BSc graduates' field of employment matched in a great extent with their education, whereas MSc graduates' match was much lower.

Keywords: employability, work-education match, forestry graduates

## Introduction

Forestry and the forest based industry have undergone drastic changes during the recent decades and especially after the financial crisis in 2008. Changes in social values and new information technologies have reformed markets of end products, such as decreased consumption of newsprint in Western countries, and these pressures had an impact on the forest based companies (Hansen *et al.*, 2013). The turmoil, in the form of new global forest industry companies, has had an effect also on forestry and its labour. Globalisation, climate change, biofuels, and new information technology, to name some drivers of change, have had qualitative and quantitative impacts on the labour markets in the forest based sector, from forest workers to academic foresters (Schmidt *et al.*, 2013). There have been doubts about forest science curricula to fulfil the requirements of current labour markets in Europe (Arevalo *et al.*, 2010).

In order to explore the relationship between forest education and labour market in this new situation we like to introduce two concepts widely used in the research of labour and education. The first concept is employability which has had several

definitions in the previous literature (Knight and Yorke, 2004; Pool and Sewell, 2007; Hillage and Pollard, 1998). The second one is the match between education and work (Duncan and Hoffman, 1981).

The purpose of this paper is to explore employability and work-education match of BSc and MSc graduates in forestry. In particular, we analyse the graduates' satisfaction with their studies in relation to working life and their opinions about work-education match and reasons for these opinions. Data comes from a Finnish national survey consisting of 520 respondents consisting of academic foresters who have earned both three years BSc and two years MSc degrees and polytechnic graduates with four years BSc degree and labelled here as BSc graduates. We present in this paper some preliminary empirical results.

### **A Frame of Reference. Employability and Work-Education Match**

There are several concepts of employability (see Knight and Yorke, 2004; Hillage and Pollard, 1998; Bennett *et al.*, 1999). Employability as a relationship between education and working life can be seen on the one hand simply as a share of graduates able to find a job within a certain period of time (Pool and Sewell 2007). On the other hand, it is possible to consider the employability as a bundle of graduate's properties, such as skills and attitudes that make him/her able to meet the requirements of labour markets (Hillage and Pollard, 1998; Bennett *et al.*, 1999; Yorke, 2004; Knight and Yorke, 2004).

It seems, that the so called "employment definition" is somewhat problematic and too simplistic, not only from a business cycles perspective, but also with respect the relevance for finding a job. Employment measures, typically whether an individual succeeded finding a job within six months of graduating, do not as such keep in mind, whether the job is of high or low value from the perspective of the graduates' education (Pool and Sewell, 2007). However, the education policy has been frequently using these measures. For instance in Finland employability has been a success indicator in models of state budget financing for vocational schools since 2006 and for universities since 2013 and for universities of applied sciences (Polytechnics) since 2014 (Anonymous, 2011a; 2011b; 2012, 2014a; 2014b).

There are several theoretically and as well as empirically tested models of employability available, which contain different broader views. These models include early models of four aspects by Hillage and Pollard (1998) and an expanded model with five components proposed by Bennett *et al.* (1999). The most well-known and respected model probably is the USEM account of employability (Yorke, 2004; Knight and Yorke, 2004). The USEM acronym stands for following inter-related components of employability as follows:

- Understanding;
- Skills;
- Efficacy beliefs; and
- Metacognition.

Pool and Sewell (2007) recognize the USEM model, however they emphasize the need for a model that is less academic and communicates more easily with non-experts. Therefore they propose a so-called DOTS model covering aspects of decision making skills, opportunity awareness, transition learning and self-awareness.

In this paper, an even more simple approach was taken, using two kinds of employability related measures. First, perceptions on working while studying were examined. Working, beside education in a study programme, is one way to increase skills and understandings related to labour market and thus improve employability. The effects of working while studying is explored with several attributes, such as whether it has an effect of the length of studies, grades, and career prospects. Second, the overall satisfaction of studies from the career point of view was measured.

Mismatch may have different implications. A job could be too demanding or not demanding enough, that is quantitative mismatch. Or the job could be in a field different from that the graduates have studied, i.e. qualitative mismatch. Moreover, the mismatch, qualitative or quantitative, may result in decreasing economic returns to education (Duncan and Hoffman, 1981; Robst, 2007).

The match between education and working requirements can be qualitative or quantitative. The research on quantitative match started in the USA from the notion, that there are decreasing returns to college education, when the number of graduates was increasing (Freeman, 1976). Since then a large number of studies have been published about quantitative match, that is, whether the years in schooling and the requirements of job are related to each other (Duncan and Hoffman, 1981; Cohn and Kahn, 1995; Robst, 1995; Groot and Maassen van den Brink, 2000; Hartog, 2000; Chevalier, 2003; Leuven and Oosterbeek, 2011). This literature uses two categories of mismatch between work and education. If workers possess more schooling than their job requires he/she is said to be overeducated, while a worker with less schooling than required is said to be undereducated. Basically the problem in the USA and several European countries has been overeducation which had decreased the salaries of higher educated labour. Recent studies have criticized these results, and proposed, that measurement errors, especially omitted variables, such as workers' ability, may explain differences in salaries (Chevalier, 2003; Leuven and Oosterbeek, 2011).

The second aspect of work-education mismatch, the qualitative one, has got much less attention. Hartog (2000) proposed that job characteristics should be included into economic education analysis. Robst (2007) analysed qualitative mismatch using the US 1993 National Survey of College Graduates (NSCG) from the National Science Foundation with 124,063 observations. Mismatch was asked with the following question:

“Thinking about the relationship between your work and your education, to what extent was your work on your principal job held during the week of April 15 related to your highest degree field? Was it closely related, somewhat related, or not related?”.

Of the respondents 55% reported, that their work and field of study are closely related, 25% somewhat related, and 20% not related. Workers, who were mismatched, earned less than adequately matched ones, keeping the amount of schooling constant. However, similar critics concerning omitted variables are valid here as it was with quantitative matching.

In this paper the qualitative work-education match was measured in the line of Robst (2007) asking respondents, whether they were working in forest sector, forest related sector, or other sectors. The quantitative match was measured asking, whether the job was lower than, equal to, or more demanding than education.

The relationship between employability and work-education match, especially the correlation and moreover causality, is not straight-forward. If we start from the second definition of employability (graduates' skills and attitudes), high employability implicates superior skills and attitudes. It seems reasonable to assume that those superior graduates have the best capacity to find a job. Let us make an assumption here:

The superior students, i.e. those with the best skills and attitudes, and other students are both equally interested (share of students) in seeking a job from their own field. (Assumption 1).

As a result, the superior students are able to take over the open positions and the other students leave more often without a job. However, this happens within the fields of their own and in other fields as well and hence the superior students simply have higher rates of employment but their work-education match is similar to that of other students. As a result there is no correlation between employability and qualitative work-education match. If the assumption 1 is not true the result is not necessarily any more valid. For example, we may assume that the superior students are more interested in the jobs related to other than forest fields. This assumption will now produce a result that higher the employability, lower the qualitative work-education match is. A false and too quick conclusion from this result would be that to improve the work-education match the employability should be reduced. Without taking into account all relevant variables, in this case graduates' own unequal interests between forest and non-forest fields, we may found odd results like this. The example shows that it is important to understand all the aspects which are important for graduates' employability.

The situation is easier with employability and quantitative work-education match. It is plausible to assume that the superior students are interested in and able to take over the jobs which are the most demanding whereas other students have to do less

demanding ones. Consequently, those with higher employability have also a higher quantitative work-education match.

### **Data and Method**

The populations studied were academic foresters graduated from the University of Helsinki and the University of Eastern Finland (former University of Joensuu), and forest engineers graduated from six Universities of applied Sciences (polytechnics). The data included all graduates in the years 2000-2008 in Finland, meaning a total of 2 900 individuals (Table 3). Academic foresters have earned degrees from both three years BSc and two years MSc programmes and they are thus labelled here MSc graduates, whereas polytechnic graduates have earned degree from four years BSc programmes and labelled here as BSc graduates. In the Finnish case, the enrolled new university students are entitled to study in both BSc and MSc programmes at the same field. Once accepted to start BSc studies at the university there is no separate application process for MSc programmes unless the student is willing to change the field of studies. This is one of the main reasons why BSc degree is not seen as an independent degree which has labour market relevance (Niemelä *et al.*, 2010). In the most typical case an academic forester has thus earned both his/her BSc and MSc degrees in the same university. After the Bologna system introduction 2005 in Finland BSc graduates from polytechnics may have applied to university MSc programmes, however, this kind of mobility has not been encouraged or monitored (Niemelä *et al.*, 2010).

The data gathering method was an internet survey, in which management assistance was received from labour unions; for academic foresters from the Society of Finnish Professional Foresters SFPF, and for forest engineers from the Forestry Experts' Association METO. Data consisted of the subpopulation of all MSc graduates (N=971) and those BSc graduates (N=811), who were members of the labour union. Email messages with a link to electronic questionnaires were sent to all members of the labour unions in late 2011. Non-members of academic foresters were contacted by regular mail collected in late 2011. The response rates were 27% for the MSc and 32% for the BSc sub-samples.

The internet questionnaires were tailored somewhat differently for MSc and BSc sub-samples: All common elements were measured similarly; these were, among others, socio-economic background, employability and general learning outcomes. Subject-specific learning outcomes were tailored in such extent for sub-samples to better meet the content of education and the labour markets for these two sub-samples.

The graduates' relationship with working life while studying was explored with seven statements (cf. Tables 2 and 3). All Finnish forestry related MSc and BSc curricula included a mandatory internship. However, in a survey working while

studying was defined excluding these internships, and thus extra-curriculum working experiences were asked for.

### Preliminary Results

Table 3. Population, sample and responses in the survey.

	MSc	BSc	Total
Population	971	1929	2900
Sample	971	811	1782
Responses	259	261	520
Response rate	27 %	32 %	29 %

The first results presented concern BSc graduates and after that MSc graduates respectively. BSc graduates' responses, with a 6 point Likert scale, to these statements are reported in Table 4. Of the 231 responses 63.5% stated "not at all", as a response to the statement "working made studies slower", however 23.2% felt, that working made studies at least somewhat slower. The statement "Working made studies faster" received 40.9% of "Not at all" responses, whereas 43.3% felt, that working made studies at least somewhat faster. The effect of working while studying on the length of studies is therefore perceived differently. Some BSc graduates felt, that working increased the length of studies and the perception of others was opposite, the latter group being superior.

Table 4. Effects of working while studying: effects on study length, learning, grades, career prospects and employability. Forest engineers (BSc) (n=231).

Statement	Not at all	Little	Some-what	Quite a lot	A lot	Very much
Working made studies slower	63.5%	14.3%	6.1%	7.0%	5.2%	3.9%
Working made studies faster	40.9%	17.8%	16.5%	9.1%	9.6%	6.1%
Working improved learning	9.1%	6.5%	12.9%	20.3%	26.4%	23.8%
Working improved my grades	19.5%	16.0%	16.5%	24.2%	16.9%	6.9%
Working decreased my grades	62.0%	16.2%	11.8%	3.9%	3.9%	2.2%
Working improved my employability	11.3%	3.9%	6.5%	11.3%	19.5%	47.6%
Working improved career prospects	16.9%	8.7%	13.9%	16.9%	18.2%	25.5%

Working during studies improved the BSc graduates' learning: 70.5% of responses were in three categories "quite a lot", "a lot", and "very much". However, only 48% answered to these same three categories related to the statement "working improved my grades". "Working decreased my grades" 62% responded "not at all". The statement "working improved my employability" received 78.4% positive

responses. Similarly the statement “Working improved career prospects” received 60.6% positive answers.

Responses from MSc graduates to statements related to working and study length are shown in Table 5. In general results indicate no clear effect on studying from working. The statement “Working made studies slower” received 42.3% “not at all” responses, whereas 39.1% answered with options from “somewhat” to “very much”. The statement “Working made studies faster” received 50% “not at all” responses, while 31.2% responded “somewhat” to “very much”. Results showed heterogeneity with respect of working while studying and study length. However, there were more MSc graduates in the “slower” than “faster” category.

Table 5. Effects of working while studying: effects on study length, learning, grades, career prospects and employability. Academic foresters (MSc) (n=97<sup>9</sup>).

Statement	Not at all	Little	Some-what	Quite a lot	A lot	Very much
Working made studies slower	42.3%	18.6%	8.2%	8.2%	15.5%	7.2%
Working made studies faster	50.0%	18.8%	15.6%	6.3%	6.3%	3.1%
Working improved learning	19.6%	9.3%	14.4%	30.9%	17.5%	8.2%
Working improved my grades	35.1%	18.6%	28.9%	10.3%	6.2%	1.0%
Working decreased my grades	49.5%	17.5%	14.4%	8.2%	8.2%	2.1%
Working improved my employability	12.4%	11.3%	11.3%	9.3%	22.7%	33.0%
Working improved career prospects	19.6%	18.6%	12.4%	8.3%	18.6%	22.7%

“Working improved learning”: Of all MSc responses 56.6% had a positive answer, that is in three categories “quite a lot”, “a lot”, and “very much”. This is somewhat less than for the BSc graduates (70.5%). Even though working was seen useful similarly, a smaller share of to BSc graduates felt, that it did improve his/her grades. Only 17.5% of MSc graduates answered positively here. “Working decreased my grades”: Half of the MSc graduates responded (49.5%) “not at all”. Of MSc respondents 65% provided positive responses to the statement “Working improved my employability” and 49.6% to the statement “Working improved career prospects”.

Unfortunately the basic information concerning the share of students working while studying was not included in the survey. However, based on the responses above

<sup>9</sup> The number of usable observations was limited to 97 because of the error in the questionnaire for the MSc subsample consisting of the members of the labour union. There were also item non-responses in some responses so that the usable number of observations in the following tables from Table 4 to Table 7 is different.

some lower limit estimates can be made for that. These questions in Table 4 and Table 5 were only relevant to those, who had worked while studying. At least  $231/261=89\%$  of BSc graduates were working while studying. Respectively there were 156 responses in sub-sample one and 97 in sub-sample two in the MSc survey. Thus the share of responses was  $(156+97)/259=98\%$ . This analysis showed that almost all BSc and practically all MSc graduates have been working while studying. The graduates' satisfaction with studies from the career point of view is found in Table 6. Measurement was done with a 6 point Likert scale. Quite few students (less than 10%) were extremely satisfied or unsatisfied. The percentage of satisfied and extremely satisfied MSc graduates were 25.3% and 4.3%, whereas these figures were 30.7% and 9.7% respectively for BSc graduates. Summing up those somewhat satisfied, satisfied, and extremely satisfied there are 65.0% of MSc and 68.3% of BSc graduates.

Table 6. Satisfaction with studies from the career point of view (n=257).

	Academic foresters (MSc)	Forest engineers (BSc)
Extremely unsatisfied	7.0%	5.7%
Unsatisfied	10.5%	8.0%
Somewhat unsatisfied	17.5%	18.0%
Somewhat satisfied	35.4%	28.0%
Satisfied	25.3%	30.7%
Extremely satisfied	4.3%	9.6%
Total	100%	100%

Table 7 shows, how different stages of the working careers are related to each other. It shows for the majority of the respondents, that the first job after graduation has been the same as the job during studies, which is 51.2% for the BSc and 56.8% for the MSc graduates. Most of the graduates have moved on from the first job after graduation and the current job is now different from the first one for 76.8% of the BSc and 81.1% of the MSc graduates.

Table 7. Relationships of three categories of jobs: during the studies, first after graduation, and current job (N=259).

First job the same as the one during studies	Yes	No
Forest engineers (BSc)	51.2%	48.8%
Academic foresters (MSc)	56.8%	43.2%
Current job the same as the first one		
Forest engineers (BSc)	23.2%	76.8%
Academic foresters (MSc)	18.9%	81.1%

Qualitative and quantitative educational matching of work was measured in the survey for the BSc and the MSc graduates. Qualitative matching of current work and education was categorized into three groups (Table 8). The first (Working in the forest sector) was common among the BSc graduates, the proportion being

86.9%, compared to 53.4% for the MSc graduates. Second, the proportion of those working in a sector related to the forest sector was higher among the MSc (19.9%) than the BSc (8.4%) graduates. Third, those working in other sectors showed a large difference, 26.7% for the MSc and only 4.7% for the BSc graduates. Based on these figures it is clear, that the qualitative matching for the BSc graduates was much better for them than for the MSc graduates.

Table 8. Qualitative matching of current work and education: working in forest or other sectors. (n=251).

	Working in the forest sector	Working in a sector related to forests	Working in other sectors
MSc graduates	53.4%	19.9%	26.7%
BSc graduates	86.9%	8.4%	4.7%

In Table 7, the quantitative matching of education and current work is illustrated. The survey asked, whether respondents' work is lower than, equal to or more demanding than the level of their education. Almost 60% of respondents in both groups answered, that the level of work and education is equal. However, 29% of the MSc graduates felt, that their work is characterized by a lower level of demand than that of education. The same figure for the BSc graduates was only 12%. Results were opposite, when more demanding work was considered. Of all BSc graduates 30% felt, that their work is more demanding than their education.

Table 7. Quantitative matching of education and current work. Work lower than, equal to, or more demanding than education. (n=250 for BSc and 249 for MSc sample).

	Matching of education and current work		
	Lower	Equal	Demanding
MSc graduates	29%	57%	14%
BSc graduates	12%	59%	30%

## Discussion and Conclusions

Working life and studies are related to each other in many ways and the relationship varies from one student to another. Results from a survey to Finnish university (MSc) and polytechnics (BSc) forestry graduates provided information on employability and career prospects. Respondents considered that their working while studying had had both increasing and decreasing effects of the length of the studies. There were more among the BSc graduates, who felt that it rather decreased than increased the length of studies. The situation was opposite for the MSc graduates. Results from a student survey by the Society of Finnish Professional Foresters showed, that around one third of the students thought, that working while studying was increasing the length of studies (Anonymous, 2011b). The question format was different than that of this paper. However, the results are in the same magnitude in both studies. Darolia (2014) states that effects of working on studies

are not straightforward, more working hours may decrease the study duration of part-time students, but increase that of full time students.

Working while studying had mixed effects on learning and career prospects. Especially, BSc graduates perceived that working improved their learning and career prospects and had a highly positive impact on employability. Both these impacts were perceived smaller among the MSc graduates. It is likely, that BSc students' working is rather closely linked to the forest sector, unlike that of MSc students.

The importance of working while studying can be seen, when the graduates' first job was analysed. For the majority of the graduates the first job after graduation has been the same as the one while studying. However, most of the graduates, eight out of ten, had already moved to another occupation at the time of the survey on average five years after graduation. As a result, it seems that the working position during the study period was important to get into labour markets, but that this position was not a satisfactory one in the long run.

The relationship between studies and working life can be explored from the learning and satisfaction points of view. Even though many graduates were working while studying and they felt, that it improved their employability, at the same time they thought, that working did not improve their grades. This may implicate, on the contrary to what is said above, that the BSc education is not so closely linked to working life. There is probably an inconsistency: if working is improving learning and employability, but it is not improving grades, this has to implicate, that learning, which is relevant to working life, is not taken into account in grading. Similar results were even more visible for the MSc graduates, not a surprise, taking into account the more theoretical nature of these studies. However, similar to the BSc graduates, the MSc graduates felt, that working improved their career prospects. Earlier studies had conflicting results on the correlation between number of work hours and grades. Some descriptive studies found, that moderate working was beneficial for the grades, whereas econometric studies have, generally but not always, come to opposite results (Darolia, 2014).

Graduates were asked to reflect their studies from the career point of view. Only few students, less than 10%, were either extremely satisfied or unsatisfied. Together those, who were at least somewhat satisfied and those, who gave a more positive response, up to extremely satisfied, account for almost 70% of the MSc and the BSc graduates. It can be concluded, that forestry graduates were rather satisfied with their studies from the career point of view.

There were some differences between response groups related to the matching of education and current work. Of the BSc graduates 30% said, that their job is more demanding than their education, while 30% of the MSc graduates answered, that their job was less demanding than their education. So from the point of view of

quantitative matching the BSc graduates felt they were under-educated and the MSc graduates over-educated. Also qualitative matching of current work and education showed dissimilarities between the groups. Of all BSc graduates 5% were working in a sector not related to forests, compared to 27% of the MSc graduates. In Robst (2007) this figure was 20% in a national survey of college graduates in the USA. Rojas-Briales *et al.* (2013) found, that 16% of Spanish forestry MSc graduates were employed in non-forestry related jobs. Contrasting the figures above with the results of this study, the recent Finnish BSc graduates' (forest polytechnic engineers) field of employment has matched in a great extent with their education whereas MSc graduates' (academic foresters) match have been lower than on average.

The reason for BSc-MSc differences is not necessarily a question of education degree. It is quite possible that university and polytechnic students' backgrounds, motivations and career plans are different. It could be for instance that MSc graduates are just much more outward oriented and actively seek jobs outside forest sector and that is why their qualitative work-education match is low. In empirical quantitative research this problem is well-known as 'omitted variable bias' (e.g. Greene, 2012). We can conclude that academic foresters and forest engineers are different in the labour markets; however, whether the reason for that comes from their education is the question that no doubt needs further research.

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## **EDUCATION IN FOREST SCIENCES AT THE FACULTY OF FORESTRY AND WOOD SCIENCES, CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE (FFWS) – ACTUAL STRATEGY**

**JIŘÍ REMEŠ**

### **Abstract**

The paper describes the actual strategy of education in forestry sciences at the Faculty of Forestry and Wood Sciences, Czech University of Life Sciences Prague. This new strategy in educational activities is based on developing three groups of actors – students, teachers and graduates. For each of them the main actual problems, goals and ways how to achieve them are described. A key challenge in this area is to increase students' motivation through changes in teacher's approach. University professors should move into the role of moderators, who ask questions and manage discussions with the aim to motivate students to think independently and to work with information. Also, new scholarship programmes, increasing the supply of foreign internships and attractive conditions for study can increase students' motivation.

The last pillar of the new educational strategy are the graduates and their acceptance in practice is. The newly established council for cooperation with practice is intended to increase the employment of graduates in future.

Keywords: Forestry education, learning outcomes, education strategy, graduates

### **Introduction**

Teachers and students are the basic target of educational activities at universities. This relationship is the basis of an educational process. Both parties participate in it, although their role is fundamentally different. Both sides interact with each other – if feedback is functioning: good teachers should be attractive for good students and talented students are a challenge for high quality teachers. Conversely, although students tend to be very critical towards poor quality teachers, they also quickly react, i.e. they resign and adapt to lower demands, or the most talented and ambitious students enrol at another faculty or university. It is clear that the position of a university student is much different than it is at lower levels of education. Students at universities should be more active and independent in the process of looking for and acquiring necessary knowledge and skills, with a natural passion for scientific and creative activities. This puts high specific demands on educators who should be able to create necessary conditions for the development of their students and should be guarantors of individual disciplines and their scientific development. Definitely, it is not enough to „teach”, it should be truly „teach and inspire”. Education is in fact much broader than just the sum of acquired knowledge, so we

also have to adapt the content and structure of study programmes. Consequently the qualities of teachers hand in hand with the quality of students create the character and quality of the faculty (FFWS, 2013). This holds too for the Faculty of Forestry and Wood Sciences, Czech University of Life Sciences, Prague (FFWS).

Emphasis on quality in higher education is also apparent from the new national strategy in tertiary education. The period of growth in student numbers seems to be over (Figure 1) and increasing importance on quality is now reflected in the funding of universities.

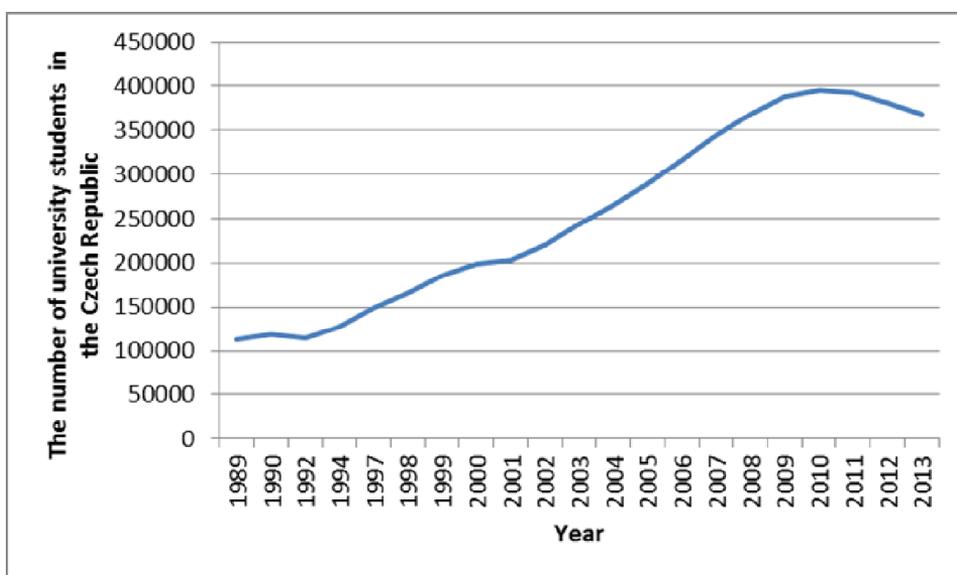


Figure 1: Trends in the numbers of university students in the Czech Republic (Anonymous, 2013; Pačes, 2013).

### Development priorities

The new strategy in educational activities at FFWS is based on developing with three priorities:

- Students in accredited study programmes and specialized courses;
- Pedagogy and teaching quality;
- Graduates and their acceptance in practice.

### *Students*

The main actual problems are

- A relatively low quality of students who start their study at the faculty;
- A high proportion of students unsuccessful during their study and at the time of state final examinations.

Our long-term vision is to recruit talented and motivated students, who meet the prerequisites for studying at universities. The failure rate of students should therefore be significantly lower than at present.

A key challenge in this respect is to increase the students' motivation. Often we think that today's students are significantly less qualified than those who were studying at the university in the past. In principle, it is not true. They only have more opportunities, how to spend their free time. It is therefore much harder to take and motivate them to study.

Educational activities of modern and successful universities and faculties, however, go beyond the accredited courses of study. Focussing on lifelong education is a clear trend; it is also a chance to raise awareness about the faculty and the study and, ultimately, contributes to a better awareness of the importance of disciplines that are developed here.

#### *Teachers and education*

The main actual problems are

- The importance of teaching in recent years has been suppressed due to higher demands on scientific research activities;
- The quality of teaching is in many cases not on a satisfactory level and does not correspond to higher education.

Long-term vision: high quality teachers, as well as respected experts, able to scientifically develop and guarantee individual disciplines, are working at the FFWS.

The new concept of educational activities at FFWS is based on the assumption that the teacher is the key player in the educational process. His role, however, changes significantly particularly at the level of university education. With the rapid development of scientific knowledge it is no longer sufficient to teach students only a certain sum of knowledge that can very quickly become obsolete. It is necessary to change the whole approach; the university professor should move into the role of a moderator, who asks questions and manages discussions (Horacek, 2014).

We must motivate students to think independently and to work with information. The weakness of our students is the inability to solve problems using knowledge and information that is available. Encyclopaedic knowledge without the ability to use it in practice is useless. Especially at university level we should encourage students to develop the ability to find innovative and new solutions. Creative (scientific) work of university professors can inspire students. As told by the American writer W.A. Ward: an average teacher tells, a good teacher explains, an excellent teacher shows, the best teacher inspires (Libich, 2014).

For these reasons, it is necessary to actively promote the quality of teaching and find suitable tools for its evaluation. For this purpose, the cooperation between

FFWS and the Institute of Education and Counseling was established. This cooperation consists of two parts - the evaluation of the teaching quality and training courses aimed at improving the pedagogical skills of teachers at FFWS. Evaluation of the teaching quality of selected teachers takes place every year. This is done by specialists from Institute of Education and Counseling in collaboration with faculty management. Results of this evaluation are discussed with concerned teachers to identify weaknesses and define procedures to improve the quality of teaching.

### *Graduates*

Graduates are the main criterion of quality of the educational process; they are the final result (the "product") of the learning process. Only graduates confirm the quality of educational institutions. In addition, unemployment of university graduates has become a criterion for funding of universities.

The main actual problems are:

- Graduates are still able to find job relatively easy, but there is no overview of companies and positions where students apply;
- It is not clear enough, if graduates obtained education that comprises all competences and skills, that are necessary for their practice;
- The communication between employers and the faculty and between graduates and the faculty is not good enough.

Long-term vision: Graduates of the FFWS are highly educated and competitive experts who easily find good jobs. Connection, communication and cooperation between graduates, their employers and the faculty is on high level. Mutual communication has to contribute to the ongoing correction of curricula to reflect the needs of the practice. The unemployment rate of our graduates remains low. However, the labour market is developing very rapidly and universities including FFWS must be ready to respond to changes

### **Specific actions to achieve the goals**

#### *Promotion of the FFWS and their fields of study*

Due to the decline of demographic development (Figure 2) and due to an increase in the number of universities in the Czech Republic (Figure 3), competition between universities and faculties is still increasing. A real "battle" for students has started. Now it is absolutely necessary to work consistently on the promotion of the FFWS and its study programmes. Therefore, the promotion and marketing is becoming a more and more important part of the FFWS management.

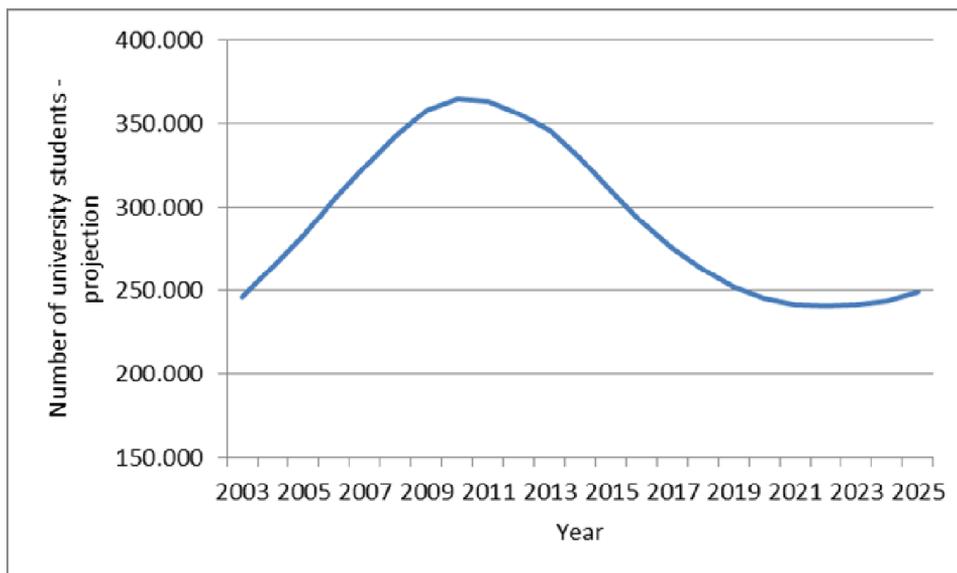


Figure 2: Number of university students in the Czech Republic – projection (Anonymous, 2013).

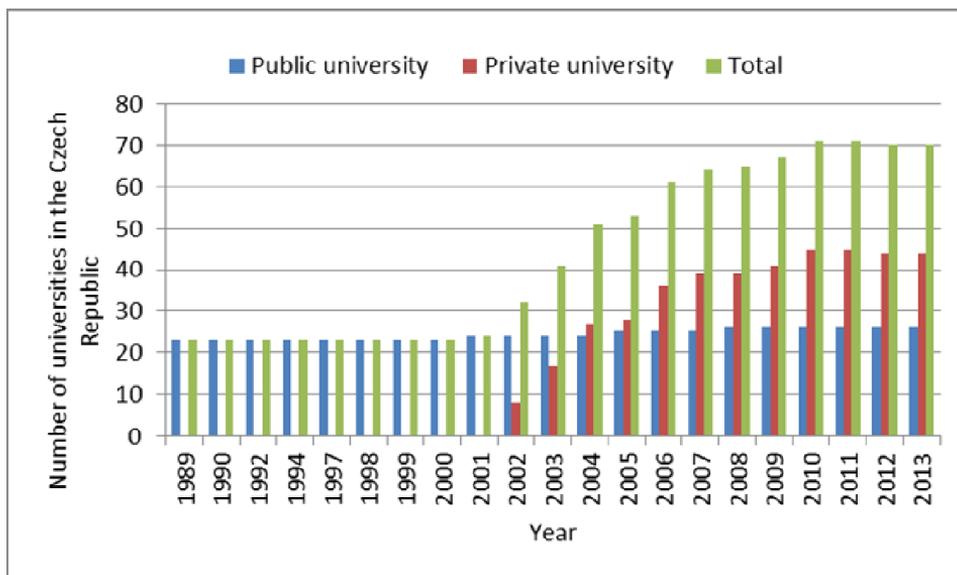


Figure 3: Number of universities in the Czech Republic in the period 1989-2013 (Pačes, 2013).

#### *Optimal and balanced structure of study programmes and fields of study*

In recent years at FFWS study programmes have been updated and reformulated. Compared to the last 20 years, study programmes have been expanded and new specialized professional bachelor study programme have been created. This is in

accordance with the strategy of the Ministry of Education, indicating that only 50% of graduates of Bachelor programmes should continue in Master programmes and 50% should start their professional career. The spectrum of study programmes, however, will not expand. Higher specialization of students is motivated by introduction of specialized modules into existing study programmes. The present study programmes and specialization options in the FFWS are shown in Table 1.

Table 1: Actual structure of the bachelor and master study programmes at FFWS.

Type	Programme	Study Specialisation	Duration (years)
Bachelor	Forestry	Forestry – general	3
Bachelor		Forestry (in English)	3
Bachelor		Economics and Administration Services in Forestry	3
Bachelor		Game Management	3
Bachelor		Game management (in English)	3
Bachelor		Conservation of nature products and Taxidermy	3
Bachelor	Wood Technology	Wood Technology	3
Bachelor		Business in the wood processing and furniture industry	3
Master	Forest Engineering	Forest Engineering	2
Master		Forest Engineering (in English)	2
Master		Forestry, Water and Landscape Management (in English)	2
Master		Tropical Forestry and Agroforestry (in English)	2
Master	Wood Engineering	Wood engineering	2

### **Favourable conditions and environment for study (optimal conditions for learning)**

In recent years, we also strive to improve the conditions for the learning processes. We have built new laboratories and study rooms, where free computers are available. Besides the above mentioned priorities, also the increasing internationalisation and numerous activities beyond the regular teaching process have become a part of faculty life.

The main priorities in this area include:

- High quality teachers and teaching including an evaluation process;
- Education also outside regular teaching (workshops, cooperation with other faculties and universities);
- Internationalization (summer school, international courses, seminars etc.);
- Attractive conditions for study;
- Motivation programmes;
- Support of free time activities of students (competition, cultural, art and sport activities and events).

### **Motivation tools for talented and highly motivated students**

The support of talented students, not just those who are already studying, but also those, who will enrol FFWS in the future, is a new long-term strategy of FFWS management. For this purpose, the new scholarship order for bachelor and master students was developed. This tool will provide a significantly higher level of support for talented and active students than in the past. The new system of support for talented students includes:

- Scholarships for excellent candidates (based on study results in secondary schools);
- Scholarships for students with very good study results (in two levels - for students with top level or very high average grades study-results during the last academic years);
- Special scholarships for excellent foreign students;
- Scholarship programme for young scientists (students). Several positions were created at each department, which may enrol students with interest and prospects for scientific work. These students can then participate in research projects. For this work, they receive a scholarship. Funding for these positions comes from a scholarship fund of the faculty and also through a special grant from the Ministry of Education, Youth and Sports of the Czech Republic;
- Scholarship for top sportsmen (Students must exhibit outstanding sports achievements (the Czech national team at the World Championships, Olympic Games, University games, etc.). They must also be good students (average grade up to 1.6);
- Language courses for students travelling to study abroad (ERASMUS PLUS);
- Voluntary courses aimed at preparing of final theses.

### **Council for cooperation with the professional sector**

Cooperation with the professional sector has gained a new impulse by the establishment of the Council for Cooperation with Practice. This council operates as a bridge between the academic and educational life of the faculty and real life in practice. Members of the council are important personalities from the forest management sector and wood processing industry. The main tasks of the council are:

- Optimization of the structure of study programmes;
- Feedback on strengths and weaknesses of graduates;
- Positive impact on employment of graduates.

A career fair, organized in the university in cooperation with this council during the last two years, has contributed to an increase in employment rates of graduates. The relatively low unemployment rate of graduates so far is evident from Table 2.

Table 2: The number of graduates and the rate of their unemployment in the first year after graduation (according to the labour office in– 2013).

Type	Programme	Study Specialisation	Number of graduates	Unemployment of new graduates
Bachelor	Forestry	Forestry – general	53	1 (2 %)
Bachelor		Economics and Administration Services in Forestry	71	3 (4 %)
Bachelor		Game Management	33	0
Bachelor	Wood Technology	Wood Technology	13	1 (8 %)
Master	Forest Engineering	Forest Engineering	75	1 (1 %)
Master		Forestry, Water and Landscape Management (in English)	5	0
Master	Wood Engineering	Wood engineering	26	1 (4 %)

## Conclusions

Education is a complex and coherent process, which takes place primarily between student and teacher. This process, however, is affected by other factors, such as social environment, the labour market situation or the rapid development of scientific knowledge. Therefore the education of a new generation cannot be a static relationship; on the contrary it is necessary to respond to new impulses and constantly innovate the educational process. Evaluation of these changes by appropriate methods is equally important. Employment of graduates may be an effective feedback. The new strategy in education at FFWS Prague is therefore focused on the development of the three main groups of actors: students, teachers and graduates. A key challenge in this area is to increase students' motivation. Therefore, we have prepared and gradually realize several motivational tools such as specialized courses for students and teachers, scholarship programmes, education outside regular teaching and internationalisation of study.

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## **THE DEVELOPMENT OF THE FOREST SCIENCES EDUCATION IN ESTONIA**

**HARDI TULLUS AND VAIKE REISNER**

### **Abstract**

University level forestry education in Estonia is organized on the basis of the Bologna 3+2 system. All forestry curricula have full accreditation awarded by the Estonian Higher Education Accreditation Centre. An accreditation team in November 2006 suggested that the Masters programmes should be made available for European applicants without proficiency in the Estonian language. The main suggestions made by an Assessment Committee in 2012 were directed to the improvement of the marketing of forestry education curricula and to wider internationalization. It is recommended to improve the English internet homepages of the university and to use more English in study programmes. The feedback systems (for students and alumni) should be more intensive and collaboration with other universities in Estonia should be enhanced.

Key words: university, forestry education, accreditation, Bologna process

### **Introduction**

On the basis of the Bologna process there has been a 3+2 higher education system in Estonian universities since 2002: BSc level (three years), MSc level (two years) and after that a four years study period for Doctor of Philosophy (Forestry). Forestry curricula exist in Estonia since 1920, in the Estonian University of Life Sciences (EMU) according to the new 3+2 system also since 2002. Nowadays there are two BSc level study programmes (Forestry and Natural Resources Management) and three MSc level programmes (Forest Management, Forest Industry and Natural Resources Management).

All curricula have a full accreditation awarded by the Estonian Higher Education Accreditation Centre. The center invited an international team of experts to assess the curricula; its last visit was in November 2006. In spring of 2010 the transitional accrediting of forestry curricula took place. The result was that EMU is the only university having the right to give higher education in the group Agriculture, Forestry, Fishing in Estonia (Tullus, 2013).

Enrolment to study places, covered by the state budget, per year until 2013:

- For enrolment at BSc level in Forest Management 23 places;
- For graduating at MSc level in Forest Management 15 places;
- For enrolment at BSc level in Forest Technology 23 places;

- For graduating at MSc level in Forest Technology 15 masters;
- For enrolment at BSc level in Nature Resources Management 17 places;
- For graduating at MSc level in Nature Resources Management 11 places;
- For PhD level 4 till 5 students.

The enrolment and graduation numbers of the forestry students are given in Table 1. In 2002, when the 3+2 system started in Estonia, the total number of enrolled forestry students was 111, from whom three years later (in 2005) only 23 students graduated. In 2005, 32 students continued their studies at MSc level, more than the number of students who graduated at BSc level because students who had graduated in the earlier 4+2 system were also allowed to continue at the new master level. Thus, 29% of graduates continued their studies at a higher level. Two years later, in 2007, the first MSc degrees in the 3+2 system were obtained by eight students. Thus, from those students who started their studies at BSc level in 2002, only 7% graduated with a master degree in 2007. In the following years the situation was a little better. Table 1 also shows that the smaller the number of enrolled students, the greater was the share of the students achieving the MSc degree.

Table 2 is listing the enrolment and graduation numbers of the MSc level for Forest Management and Forest Industry curricula students. Obviously there is high variability between years. We guess that, for example for the year 2011, students were more eager to continue their studies at a higher level because it was almost impossible to get a professional job at that time.

Table 1. Numbers of students studying Forestry at BSc level and Forest Management and Forest Industry at MSc level.

Starting year	BSc		MSc		% of students started at BSc level graduated BSc level	% of students started at BSc level continuing at MSc level	% of students started at BSc level graduated at MSc level
	Enrolment	Graduation	Enrolment	Graduation			
2002	111	23	32	8	21	29	7
2004	135	42	29	17	31	21	13
2006	70	54	33	22	77	47	31
2008	71	55	40	24	77	56	34
2010	83	38	22	will graduate in 2015	46	27	
2012	80	will graduate in 2015	enrolment 2015				

Table 2. Enrolment and graduation, MSc.

Year	Forest Management		Forest Industry	
	Enrolment	Graduation	Enrolment	Graduation
2007	14	6	15	2
2008	17	5	10	8
2009	13	9	20	8
2010	14	12	15	9
2011	20	12	20	10
2012	20	12	6	12
2013	8	15	14	9

The accreditation team suggested in November 2006 that the MSc programmes should be made available for European applicants without proficiency in the Estonian language. The suggestion was to design just one BSc programme, providing capabilities for further specialization within any of several MSc programmes, also other than Forest Management and Forest Industry.

### **Suggestions made by the Assessment Committee in 2012 for forestry curricula**

The 2012 Assessment Committee made the following suggestions:

- Marketing in its widest sense needs to be improved and become pro-active. Planning and monitoring of media communications and public-orientated activities should be undertaken together with collecting, assessing, and communicating feedback from these activities by the University Department of Marketing and Communication. These results may optimize the workload going into the marketing.
- The Department of Marketing and Communication also needs to improve the English internet pages of EMU. These pages need to have a specific focus on wider internationalization embedding it across EMU. An international office may help the already increasing numbers to further increase, in some areas: student and staff mobility both outwards and incoming. ‘EMU’ in English is a very effective logo and may be more widely used to score better – may be to increase the number of senior post applications at EMU as there are few applications currently.
- More use of English is needed across EMU’s programmes from BSc level upwards. This includes teaching as well as learning, writing, and oral work of students. Estonia is member of the EU where English is the main business language. English is important for students to qualify for a wide range of careers including jobs with international businesses both inside Estonia and externally. The Assessment Committee was concerned that only the Estonian language will be adopted for EMU’s BSc programmes and also partly for MSc programmes as is suggested by a new law yet to be legally adopted. EMU graduates would then become less competitive in their careers, on the job market, particularly with international companies and international trade.
- The effectiveness of the feedback systems is variable. Feedback from EMU’s study information system is low at 20-15% from the number of students

participated in the curriculum. The Assessment Committee recommended a revision of the feedback systems for overall coherence and effectiveness.

- The Assessment Committee recommends that library staff provides guidance on literature search to groups of students, instead of individually, early in their studies and makes attendance compulsory.
- Although there is an effective quality assessment system in the university there is a very long list of management features including plans, strategies, sub-strategies, priorities, fields of activity, and a plethora of indices. Too many instruments, used too often, can dilute the effectiveness of management. Thus, the Assessment Committee recommends that regular checks and evaluations are made on these many management features (as has been undertaken in the past) and adjustments and refinements made where appropriate in order to provide a sharp management system and greater clarity.
- There should be an improvement in the overall standard of research supervision including the supervision of PhD students researching off-site. An analysis of staff workloads between teaching and research duties would be beneficial to attain an appropriate balance overall.
- With benefit both to EMU, to Tartu University, to the city, and to Tallinn University of Technology, the Assessment Committee recommended continuing with and increasing the collaboration overall between students, between staff, between the infrastructures and between study programmes. There is collaboration currently, but the Assessment Committee believed that this should be enhanced. It might also be possible to establish Tartu as a scientific centre for Estonia, even for the Baltic States, and maybe for wider regions too. More collaboration internationally would also be of benefit.
- A constant vigil is needed for plagiarism. It is too easy for students to use the internet and plagiarize other people's work or ideas. It is a world-wide problem in higher education particularly. Although there is no evidence of recent cases at EMU, checks must be maintained and the EMÜ policy, with penalties clearly provided, should become more widely known and embedded with all staff and students.

Another reform in Estonian public universities started in 2013 abolishing tuition fees. Higher education has been free of charge since the 2013 enrolment. For every university priority areas are agreed in a special agreement between state and university. For the Estonian University of Life Sciences the priority areas are Forestry, Veterinary and Agriculture. Also new rules for the financial system between universities will be created. It means also new rules of budget inside university.

### **Résumé**

Forestry education in Estonia on university level has full accreditation awarded by the Estonian Higher Education Accreditation Centre. The accreditation team suggested in November 2006 that the MSc programmes should be made available

for European applicants without proficiency in the Estonian language. The main suggestions made by the Assessment Committee in 2012 are: to improve the marketing of forestry curricula; to improve English internet pages of the university and increase the use of English in the study programmes; EMU needs to have a specific focus on wider internationalization; the feedback systems should be more intensive; collaboration with other universities in Estonia should be enhanced.

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## **THE ADVANCEMENT OF THE TEACHING PROCESS AT THE FORESTRY FACULTY OF THE UNIVERSITY OF SARAJEVO IN LINE WITH THE PRINCIPLES OF THE BOLOGNA PROCESS**

**MIRZA DAUTBAŠIĆ, ĆEMAL VIŠNJIĆ AND FARUK BOGUNIĆ**

### **Abstract**

The University of Sarajevo is the oldest and the most important university in Bosnia and Herzegovina. It consists of 25 faculties and academies, five institutes, five university centres, with about 35.000 students. The Faculty of Forestry, established in 1948, is one of the oldest faculties of this university. Till 2005, teaching by the Faculty of Forestry was conducted in the traditional way: a four-year study was followed by a two-year master study and doctoral study.

In 2005, the study programmes have been reformed according to the Bologna principles in the form of a three-cycle system (FFUS, 2005). The undergraduate (BSc) programme has a duration of three years. Two different programmes are offered: Forestry and Horticulture. The MSc programme has duration of two years with two programmes: Sustainable management of forest ecosystems and Horticulture. The doctoral (PhD) programme Forestry and Horticulture has a duration of three years.

The lack of teaching staff and equipment is the main problem impeding a successful implementation of the Bologna principles. Low percentages of students passing from one year to the next within the undergraduate programme are a problem. Efforts are made to improve this by a more active engagement of professors and students in teaching and learning. Moreover it is tried to improve the mobility of students by harmonization of curricula and programmes with Universities in the neighbouring and other countries and also by signing Memorandums on Cooperation with related European Universities.

Key words: study programme, BSc, MSc, forestry, Bologna declaration:

### **Introduction**

The Faculty of Forestry of the University of Sarajevo was established in 1948 (see Beus, 2008) and is one of the oldest degree-granting educational institutions in Bosnia and Herzegovina. The University of Sarajevo is the oldest and the most important university in Bosnia and Herzegovina. It consists of 25 faculties and academies, five institutes, five university centres, with about 35.000 students. Teaching and research activities and the development of both are conducted in the two departments: Forestry and Horticulture.

During its history the Faculty passed through different phases of development. Throughout its existence the Faculty has undertaken efforts to answer to the challenges generated by the society and the forestry profession. Following changes in the field of forestry due to the introduction of new scientific ideas, appropriate study programmes were created in which students were taught up-to-date knowledge on the management of forests and forest land as natural resources of our State (see FFUS-Web, s.a.).

The Principles of the Bologna Declaration were implemented at the Faculty of Forestry of the University of Sarajevo in 2005/2006 with the start of the education of the first generation of students according to the Bologna Declaration. Since then much attention is given to creating a European Area of High Education at the University like implementing quality assessment, a grading system, a three-cycle system of education, the European dimension, comparable degrees of education, student mobility, life-long learning and recognition of diplomas and study time (see Bologna Declaration, 1999). The Faculty of Forestry at present offers two complete three-cycle programmes based on the Bologna principles: Forestry and Horticulture.

The undergraduate programme (BSc) is a three year programme using the European Transfer and Accumulation system (ECTS) of credits or study points and every subject is rated with a certain number of points. Each semester includes 30 points, adding up to 180 points for the whole programme. At graduating the diploma Bachelor of Forestry or Horticulture is given to the student. Complete insight in the success of a student is provided by an additional document to the diploma, the diploma supplement.

In the two year graduate programme each semester includes 30 ECTS points, adding up to 120 points for the whole programme. At graduating the diploma Master of Forestry or Horticulture is given to the student including a diploma supplement.

The third cycle consists of a research oriented study programme in forestry sciences in which the student has to achieve 180 ECTS points. Through courses 42 ECTS points can be obtained. The balance is obtained by research work mainly related to the topic of the doctoral dissertation. These research related points can be achieved by experimental work in laboratories or in natural or production-oriented forests, by verified research activities and by making and defending a doctoral dissertation.

### **Study programmes at the Faculty of Forestry in Sarajevo**

#### *Undergraduate (BSc) programmes Forestry and Horticulture*

The undergraduate curriculum Forestry has a duration of three years (six semesters) during which the student will gradually meet the subjects and the problematic in this field. The study aims at the education of forestry experts of a general profile with a balanced relation between the knowledge of general, ecological, technical-

technological and economic disciplines (see Table 1). At the end, the graduates of this curriculum have operational knowledge necessary for realization and monitoring of projects in forestry and related fields. On the other hand, this certificate is a good starting point for continuation in the MSc programme Forestry (see below). Most of the graduates continue with studying at Master level although they have good opportunities to find a job in the State Forest Enterprises.

The undergraduate curriculum Horticulture has the same structure and aims as the curriculum Forestry, with appropriate adaptations to horticulture. This certificate is a good starting point for continuation in the MSc programme Horticulture (see below). Most of them continue with studying at Master level. On the contrary to forestry students undergraduate students of horticulture hardly find a job on the labour market due to fact that State does not formally recognized the posts of Horticulture.

Table 1. Courses included in the BSc programmes Forestry and Horticulture.

Source: FFUS, 2008a; 2008b.

Year	Semester	Forestry		Horticulture	
		Subject	ETCS	Subject	ETCS
1	1	Principles of ecology in forest management	6	Principles of ecology in forest management	6
		Mathematics	6	Mathematics	6
		Chemistry	6	Chemistry	6
		Forest Botany	6	Botany	6
		Field survey in forestry and horticulture	6	Field survey in forestry and horticulture	6
	2	Plant physiology	7	Applied physiology in horticulture	6
		Dendrology	7	Dendrology	6
		Wood anatomy	6	Plant taxonomy	3
		Forest genetics	6	Genetics in horticulture	6
		Plant taxonomy	4	Principles of civil engineering	6
-	-	Principles of urban greenery	3		
2	3	Seed production and forest nurseries	6	Dendrology – ornamental trees and cultivars	6
		Principles of forestry mechanisation	5	Pathology of ornamental plants	6
		Forest entomology	5	Wood anatomy	5
		Forest pathology	5	Biometry	5
		Biometry in forestry	5	Visual arts	5
		Compulsory subject 1	5	Compulsory subject 2	4
	4	Non-wood forest products	5	Phytocoenology	6
		Principles of soil science in forestry	6	Dendrometry	6
		Phytocoenology in forestry	5	Gardening with herbaceous perennials and annuals	3
		Transport infrastructure in	5	Principles of soil science in	6

		forestry		horticulture	
		Dendrometry	5	Horticultural entomology	6
		Elective subject	4	Elective subject	3
3	5	Forest protection	5	Plant protection	6
		Principles of forest policy and economics	6	Mechanisation in horticulture	6
		Forest yield and increment	5	Plant nutrition	6
		Wildlife preservation and hunting	5	Seedling production	6
		Water stream management	5	Elective subject 4	3
		Elective subject 3	4	Elective subject 4	3
	6	Silviculture	5	Economics of enterprises in horticulture	5
		Organisation of business systems in forestry	5	Organisation of business systems in horticulture	5
		Forest Economics	5	GIS principles with urban greenery	4
		Forest harvesting	5	Arboriculture and landscape design	6
		Forest management	5	Bachelor thesis	10
		Bachelor thesis	5	-	
Total:			180		180

Elective subjects: 1 (Protected forest areas, Forest protection in protected forest areas), 2 (Protected forest areas, Water elements in urban greenery), 3 (Forest soils, Plant nutrition in forest nurseries), 4 (Rockeries in horticulture, Outdoor furniture in gardens and parks)<sup>10</sup>

#### *Graduate/master's programme at the Department of Forestry*

The graduate programme Forestry has a duration of two years during which the student is gradually introduced with the problematic of sustainable management of forest ecosystems. The programme aims at the education of forestry experts with a general profile and a good balance between general, ecological, technical-technological and economic disciplines (see Table 2). After graduation these students have the knowledge and skills necessary for realization of complex tasks in the process of planning, executing, monitoring and evaluating actions in forestry and related fields. Graduates of the MSc Forestry programme are highly demanded by the labour market and most of them are employed in State Forest Enterprises.

#### *Graduate/master's study (MSc) at the Department of Horticulture*

The graduate programme of Horticulture has a duration of two years (four semesters) during which the student is gradually introduced with the problematic of sustainable management of horticultural ecosystems. The programme aims at the education of horticultural experts with a general profile and a good balance between general, ecological, technical-technological and economic disciplines (see Table 2). After graduation these students have the knowledge and skills necessary for realization of complex tasks in the process of planning, executing, monitoring and

<sup>10</sup> Students have to choose one of the two courses combined between brackets.

Table 2. Courses included in the MSc programmes Forestry and Horticulture.  
Source: FFUS, 2009a; 2009b.

Year	Semester	Forestry		Horticulture	
		Subject	ETCS	Subject	ETCS
1	1	Introduction to forest research	3	Introduction to horticulture research	4
		Forest harvesting	6	Experimental design in horticulture	4
		Forest policy and legislation	6	History of landscape architecture	6
		Forest plantation	6	Tree breeding in horticulture plants	6
		Experimental design in forestry	3	Urbanism and environment	4
		Compulsory subject1	3	Compulsory subject2	3
		Compulsory subject1	3	Compulsory subject2	3
	2	Silviculture techniques	6	Principles of ornamental planting design	6
		Pests in forest ecosystems	6	Urban greenery pests	5
		Pathogens of forest trees	6	Graphics in landscape architecture	5
		Forest inventory	6	Marketing, trade and markets in horticulture	5
		Elective subject3	3	Pathogens of ornamental plants	3
		Elective subject3	3	Elective subject4	3
	-		Elective subject4	3	
2	3	Economy of business system in forestry	6	Project management in urban greenery	5
		Forest management-planning of management	6	Economics of urban environment	5
		Opening of forests	6	Biodiversity and conservation	5
		Project magament	6	Landscape management	6
		Elective subject5	3	Analysis and valorisation of environment	3
		Elective subject5	3	Elective subject6	3
			Elective subject6	3	
4	Master thesis	30	Master thesis	30	
Total:					

Elective subjects: 1 (Evaluation of forest ecosystem, Marketing, trade and markets of forest products, Technical characteristics of wood, Safety at work in forest harvesting, Assessment of environmental impacts, Productivity and quality of soil types, Forest fires, Game breeding, Remote sensing in forestry, Technical goals of Forest management), 2 (Evaluation of forest ecosystem, Assessment of Environmental impacts, Productivity and quality of soil types, Physiology of plant stress), 3 (Accounting and balancing in forestry, Managing of protected areas and ecotourism, Mechanisation for forest harvesting, Forest biomass for energy, Breeding of forest trees), Genetic variability of forest trees, Hunting grounds management, Physiology of plant stress, Forest typology, Methods in forest yield researches) 4(Managing of protected areas and ecotourism, Urban wildlife, genetic variability of trees and bushes, Growing of forests of special purpose, Forest harvesting in forests of special

purpose, 5(Politics, legislation and organisation of game management, Public relations in forestry, Recultivation of eroded forest areas, Projecting, building and maintenance of forest communications, Afforestation of extreme stands, Damages and sanitation of soil, Phytopharmacy in forestry, Monitoring in forest protection , GIS in planning of forest management, Mapping of soil and vegetation), 6 (Public relation, Damages and sanitation of soil, Phytopharmacy in horticulture, Recultivation of eroded forest fields)<sup>11</sup>.

evaluating actions in horticulture and related fields. Neither the BSc graduates Horticulture nor the MSc graduates horticulture are recognized by the labour market due to fact that State does not formally recognized the posts of Horticulture and most of them are unemployed.

#### *Doctoral study (PhD) at the Faculty of Forestry*

The doctoral (PhD) study at the Faculty of Forestry has been organized from the year 2013/2014 onwards. It is completely profiled as research study and aims at providing the highest degree of university education, formally recognized, and the title of Doctor of Sciences (PhD). This doctoral programme or the third cycle of the study has a duration of three academic years (six semesters) in which the student achieves 180 ECTS points.

This programme includes the participation of candidates in scientific-research work, interactive methods of transfer and adoption of knowledge, and independent planning, realization and defending of a doctoral thesis. It enables candidates to plan and realize independently research in the field of study. The programme belongs to the bio-technical scientific area, scientific field of forestry and horticulture. A broad team of professors and the broad range of subjects offered cover practically all branches of this scientific field. The programme aims at imparting in the student:

- Systematic understanding of scientific bio-technical research within the scientific field of forestry and horticulture;
- Capability for independent research work within forestry and horticulture;
- Capability to synthesize, explicate, design, implement and adopt processes based on scientific achievements;
- Capability for independent original research expanding the boundaries of knowledge, and deserving to be published in domestic and international journals;
- Capability for critical analysis, evaluation and synthesis of new and complex ideas;
- Ability to formulate a point of view on ethically and socially acceptable technological progress based on new knowledge in an academic and professional context.

In the year 2013/2014 12 candidates were enrolled.

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<sup>11</sup> Students have to choose two of the available courses combined between brackets.

### Students' progress through the years

To analyse the implementation of the Bologna system at the Faculty of Forestry the flow of undergraduate and graduate students through the years was monitored for the curricula Forestry. In the analysis all students enrolled in first, third, fifth and seventh semester (regular – enrolled for the first time in a given year – and repeaters – enrolled for a second time in a given year after failing to pass two or more course examinations) are included, starting from the school year 2010/2011 up and including the school year 2013/2014. Results of the analysis are presented in Tables 3 and 4.

Table 3. Number of students enrolled in the undergraduate curriculum Forestry per year. In bold the movement of one cohort of students through the three years of the curriculum<sup>12</sup>.

School year	Study year in undergraduate curriculum								
	I			II			III		
	Regular	Rep*	Total	Regular	Rep*	Total	Regular	Rep*	Total
2010/2011	82	55	137	63	29	92	98	38	136
2011/2012	88	70	158	54	15	69	53	81	134
2012/2013	82	73	155	58	31	89	29	73	102
2013/2014	91	64	155	54	36	90	50	49	99

\*: rep = repeater: students having to repeat a year, due to not passing two or more course examinations.

Out of the total number of students (137) enrolled in first study year in 2010/2011, only 54 students, or 39.4%, passed without problems into the second year. Of these 54 students, plus 15 repeaters (in total 69 students) only 29 students, or 42.1%, passed into the third year. Other cohorts of students in earlier or later years showed similar movements. This very low rate of success may be caused by: a lack of proper knowledge obtained by students at their previous educational levels; a small portion of candidates apply for studying just to get and use benefactions (travelling tickets, state subsidies, etc), insufficient number of teaching staff (200 students per one professor per subject), lack of students' evaluation of professors and assistants, etc.

To comply with this problem, intensive measures were successfully taken to involve students more actively through classes and exercises to master the subjects offered in the curricula and pass examinations.

The vertical passing percentage of students in the graduate curriculum of Forestry from first to second study year is significantly better as can be seen in Table 4.

<sup>12</sup> Faculty of Forestry- Own data.

Table 4. Number of students enrolled in the graduate curriculum Forestry per years. In bold the movement of one cohort of students through the two years of the curriculum<sup>13</sup>

School year	Study year in the graduate curriculum					
	I			II		
	Regular	Rep*	Total	Regular	Rep*	Total
2010/2011	28	0	28	19	3	22
2011/2012	35	1	36	27	5	32
2012/2013	34	0	34	36	1	37
2013/2014	27	2	29	32	7	39

\*: rep = repeater: students having to repeat a year, due to not passing two or more examinations.

### Problems met and solved during the implementation of the Bologna principles

Since the start of the implementation of the Bologna Principles we have met certain problems of which many have been overcome. However, numerous activities, defined by the Bologna Principles were not completely enforced making the realization of these principles and the improvement of study quality difficult. Out of the problems generated by the introduction of the Bologna principles the following should be mentioned:

- Slow transformation of the education methods from the traditional ones towards the Bologna method of education. Especially elder professors, who had difficulties to adjust to generated changes, struggled with this transformation (Anonymous, 2010).
- Different understanding of the Bologna principles by professors and certain differences in implementation. In time the differences have been reduced and today the application of the principles is completely correct and valid.
- Lack of technical equipment and capacities for performing the teaching process.
- Lack of teaching staff and assistants for performing the teaching process according to Bologna principles of education. A small number of professors and associates cannot realize all required teaching activities. For employment of new staff members, the approval from a competent Ministry is necessary, which cannot be obtained due to the lack of funds.
- Low percentage of students passing their examinations during the undergraduate curriculum, preventing them to enrol in the next curriculum year in the next calendar year. This problem was present even before the introduction of the Bologna principles which was not significantly changed by the introduction. Low passing percentage can maybe be attributed to particular lacks in the implementation of Bologna principles, to poor knowledge of

<sup>13</sup> Faculty of Forestry- Own data.

students who enrol this curriculum but also to the high demands for knowledge imposed by professors.

- Poor mobility of students. The mobility of students was not significantly increased as intended in the Bologna principles. However, there are individual examples of students going to study at universities abroad during one or more semesters. Also there are few students from other universities studying at the Faculty of Forestry.

## **Conclusion**

The Faculty of Forestry of the University of Sarajevo has implemented the Bologna principles of education through the study programmes for undergraduate (BSc) studies in the school year 2005/2006, for graduate (MSc) studies in the school year 2008/2009, and in the doctoral studies (PhD) in 2013/2014. Since the implementation until present the undergraduate study programmes were innovated and there is a permanent attention for ongoing improvement of the existing programmes. Professors have adjusted to the new way of education (teaching and learning) and they actively participate in creating teaching activities aimed at the student's needs for particular skills and competences. The low vertical passing percentage of students during the undergraduate study is maybe a result of the bad previous knowledge of the students who enrol at the Faculty as well as due to high demands for knowledge imposed by the professors. To solve these problems intensive measures were taken to involve students more actively through classes and exercises to master the subjects from curricula and successfully pass examinations. The lack of mobility of students is the result of non-harmonized curricula and programmes with Faculties in the region and abroad. The lack of teaching staff and equipment is evident; we explore possibilities for employment of new assistants. Happily some projects are dedicating equipment for improving teaching activities, for conducting classes and research work.

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## **HISTORICAL DEVELOPMENT OF FORESTRY EDUCATION IN TURKEY AND ITS REFLECTIONS IN THE FOREST POLICY MAKING PROCESS**

**SEÇİL YURDAKUL EROL**

### **Abstract**

The demands of society on forest resources have changed in the historical process. Whereas the initial demands were related with wood production, the current have multi-dimensional characteristics. Of course this change has implications for forestry education. According to this situation the early aim of forestry education focused on just to educate forestry professionals for the national forestry organization. Beside this, the current aims of forestry education are varied and include producing knowledge, raising awareness of society, contributing to sustainable development and playing an active role in the forest policy making process.

On the one hand forestry education is accepted as one of the contemporary forest policy tools. Forestry faculties contribute to the policy making process by their scientific research and educational activities. On the other hand the large part of forestry organization's technical staff consists of forestry professionals who graduated from forest faculties. Thus the educational background of these professionals directs both policy making and implementing stages. Moreover the changes in forest policy have also effects on the components of forestry education. Hence there is a dynamic interaction between forestry education and forest policy. Thus they both have a critical importance for each other's success and sustainability. Also solving the problems of forest policy is fully possible without having an ideal forestry education system. Therefore a contemporary forest policy approach has positive and direct effects on developing the forestry education system.

The aim of the paper is to examine the development and interactions of forestry education and forest policy in the historical process and to express their current reflections to each other. The literature review and archive research give the essential data for the historical background. Furthermore the highlighted issues are investigated in the content of current policy documents and strategic plans by using qualitative analysis.

The main findings show that "forest faculties and universities" and "science and research institutions" are accepted as the privileged stakeholders in forest policy process. Forestry institutions and organizations are significant stakeholders in the forestry education and research process. Collaboration, coordination and

communication are defined as important components in terms of relation of two sides in actual forest policy documents.

Keywords: Forestry Education, Forest Policy, Historical Assessment, Content Analysis

## **Introduction**

Forest policy has great, pressing needs for information. The state and private stakeholders are well aware of the fact that information is an important source for solving problems and gaining power (Krott, 2010). Moreover successful policies can be formulated by establishing close ties between research, policy and the general public as well (Janse and Konijnendijk, 2007). Scientists can provide natural resource managers and policymakers with the foundational information for making reasoned decisions (Shaw III *et al.*, 2000).

In this context, the importance of integrating scientific knowledge with forest policy is highlighted in international processes in the last decade (UN, 2004; MCPFE, 2003; EU-CEC, 2006). Although this trend has been intensified, the policy decisions are still taken largely independently from the actions of scientists and researchers. The link between research and policy is often diffuse and direct linkages between research and policy are rare (Spilsbury and Nasi, 2006). On the one hand it is said that, too often, scientific information is valuable, yet policy makers do not use it (Guldin, 2003). On the other hand forest policy makers tend to see that the problem of the insufficient use of existing information is mainly the fault of the research community. The users blame researchers for not working on relevant projects, which should supply the information they need (Janse, 2008).

It is possible to make a corresponding evaluation for Turkey. Though forestry education and research are accepted as forest policy instruments (in the category of information based instruments) one cannot assume that there is an efficient relationship between education and research with forest policy.

In this context the aim of the paper is to investigate the position and perceptions of forest education/science in some selected forest policy documents. Also the relationship between forest policy and research is evaluated in the context of these documents regarding forestry education. The historical process of forestry education and forest policy is explained comprehensively. However, it has to be mentioned that some of the historical events are considered in both forest policy and forestry education arenas. Finally the prominent issues are discussed and some considerations are made with respect to the Turkish forestry case.

## Method

A document-based investigation was used in this research. First, the historical relations of the forestry sector and forestry education were analysed by literature review. Then content analysis was applied on both recent forest policy and the selected forestry education related documents.

Content analysis is a research method for making replicable and valid inferences from texts to the context of their use (Krippendorff, 1980). Thus content analysis is useful for examining trends and patterns in documents (Stemler, 2001). Coding units are content subdivisions used for classification (Colton and Covert, 2007). Thus defining the coding units is one of the most fundamental and important decisions in content analysis process (Weber, 1990). In this study sentences were used as coding units. Frequency analysis was utilized to determine the number of key expressions. And then the meanings of the related sentences were analysed.

First of all some of the current national forest policy documents and strategic plans are investigated to determine the approaches and demands of forestry education. These documents are the following ones: Special Report on Forestry of 9th Five Year Development Plan<sup>14\*</sup> (DPT, 2007), Turkish National Forestry Programme (MoEF, 2004), Strategic Plan of Ministry of Forestry and Water Affairs 2013-2017 (MoFWA, 2012), Strategic Plan of General Forest Directorate 2013-2017 (GDF, 2012). Other documents that involve forest policy aims like legal arrangements and other documents are left out of the research scope. Actual and national wide policy documents are selected as the main resource for the research. Legal arrangements are left out of scope because there are too many of these arrangements related to different aspects of forestry in Turkey and thus considering them will make the results messy and so it would not give additional and reliable information. Also there is no directly relevant legal arrangement regarding the relations between forestry organizations and forestry education and research. Thus also it can be said that no clear relationship would be expected.

The key words which were searched in the documents mentioned above are “university- faculty of forestry (üniversite-orman fakültesi)”, “research institutions (araştırma enstitüsü)”, “forestry education (ormancılık eğitimi)”, “in-service training (hizmet içi eğitim)”, “vocational high school (meslek yüksekokulu)”, “science – scientist (bilim – bilim insanı)”, “research – researcher (araştırma – araştırmacı)”. The essential and general expressions that represent “forestry education and science” were determined as keywords.

In the second phase the documents directly related to forestry education are analysed. There is not a common national wide forestry education policy document

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<sup>14</sup> Five Year Development Plans are a kind of national plans that have been prepared for five years since 1963 in Turkey and have aimed to determine basic economic, social and environmental development goals. Also Special Reports of some important sectors are prepared under these plans.

on this issue. Thus the strategic plans (SP) of Turkish Forestry Faculties (Forestry Faculties of Istanbul University, Karadeniz Technical University, Süleyman Demirel University, Düzce University, Bartın University, Artvin Çoruh University) are examined. There are also some other faculties of forestry providing professional education (university education) in Turkey. However, it was impossible to include their strategic plans because they are in preparation. The key words which were searched in the mentioned documents are “forestry organization”, “sectoral policy”, “sectoral demand”, “sectoral problem”, “local-regional contribution”. Also similar expressions are considered, for example “forest policy”, as expression in the category of “sectoral policy” (These are not synonyms but the contents and intentions are very proximate). The mentioned expressions and also the proximate terms are evaluated in terms of content analysis. Also the sentences which have one of these expressions were also categorized in terms of meaning and the content of the sentence. The expressions were investigated by utilizing the “find” function of WORD or PDF formatted documents. The results were checked by marking on paper to ensure reliability.

## **Results**

### *Chronological explanation on backgrounds of Turkish forestry education and forest policy*

The period is divided into two parts as Ottoman Empire Period (1839-1920) and Turkish Republic Period (1920-today). Some important historical points are explained in the paper and the evaluations were made just in the frame of chronological order.

#### *Ottoman Empire Period (1839-1920)*

Forests were used as a source of income in early stages of the Ottoman Empire. Upon the issuance of the Reform Declaration, more attention was paid to forestry. By the effect of this perception some developments occurred in the historical process. Some of them have importance in terms of forest policy and forestry education and are listed chronologically in Figure 1 and Box 1.

As seen in Box 1 the developments of forest policy and forestry education are chronologically closely connected. This means an event in forest policy or organizational change generally had an effect on forestry education. But also it has to be kept in mind, that this finding is just a result of chronologic process. There is no deeper causal analysis behind this notion.

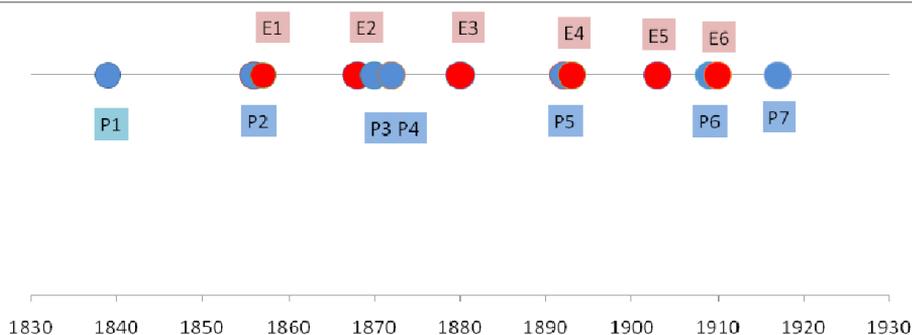


Figure 1. The historical sequence of some important events regarding forest policy (P-events) and forestry education (E-events) during the Ottoman Empire period.

<p><b>Box 1: The historical sequence of some important events regarding forest policy (P-events) and forestry education (E-events) during the Ottoman Empire period. See Eraslan, 1989; Eryılmaz, 2008; Gülen and Özdönmez, 1981; Özdönmez et al., 1996.</b></p>
<p>P1 (in 1839): Upon the issuance of the Reform Declaration, more attention was paid to forestry and hence the “Forest Directorate” was founded. This Directorate was the first organization in the history of forestry.</p>
<p>P2 (in 1856): Experts were brought to Turkey from France. These experts were in charge of examining and managing the forests in Turkey, training the staff for protection and management of the forests and preparing legislation for arranging the forestry works legally.</p>
<p>E1 (in 1857): Upon recommendation of the experts, a forestry school was founded in Istanbul for the purpose of training forest staff. This was realized by one of the afore mentioned French forest experts, Louis Tassy.</p>
<p>E2 (in 1868): The forestry school had to undergo some reforms on the administrative level and the educational structure. Also a directive regulation was issued. Thus the school was consolidated legally by the empire.</p>
<p>P3 (in 1870): The “Forest Regulations” were formulated. This was the first and the most important document which shaped Turkish forestry and determined the policy related protection and management of the forests.</p>
<p>P4 (in 1872): Forestry and mining organizations were consolidated and so the Ministry of Forestry and Mining was founded.</p>
<p>E3 (in 1880): By the effect of consolidation of mining and forestry organizations the forestry school was merged with the mining school.</p>
<p>P5 (in 1892): There was an organizational connection between the Ministries of Forestry, Mining and Agriculture.</p>
<p>E4 (in 1893): Forestry education was moved under agriculture education. (The name of the school was Halkalı Agriculture School)</p>
<p>E5 (in 1903): Forestry education and agricultural education was brought together under the same roof (The name of the school was (Halkalı Agriculture and Forestry Collage)</p>
<p>P6 (in 1908): Forestry operations were carried out under different Ministries until the declaration of the 2nd Constitutionalism. In 1909, forestry operations were organized under a general directorate and local management units were established.</p>
<p>E6 (in 1910): Experiences showed that the education of mining and agriculture were different from that of forestry and also by the effect of declaration of Constitutional Monarch (in 1908), deficiencies in forestry education standards were realized, and then a “Forestry Collage” was established.</p>
<p>P7 (in 1917): Upon entry of “Law related with Scientific Management of Forests” the ‘Planned forestry period’ began in Turkey and so the technical forestry stage started for national forestry. (The main approach of the mentioned law was that the forests have to be managed by using forest management plans. And thus technical planning process was started for forestry management).</p>

*Turkish Republic Period*

After the declaration of a republican regime in Turkey in 1923 the countrywide improvement process also affected forestry and forestry education. The chronologic development is shown in Box 2 and Figure 2.

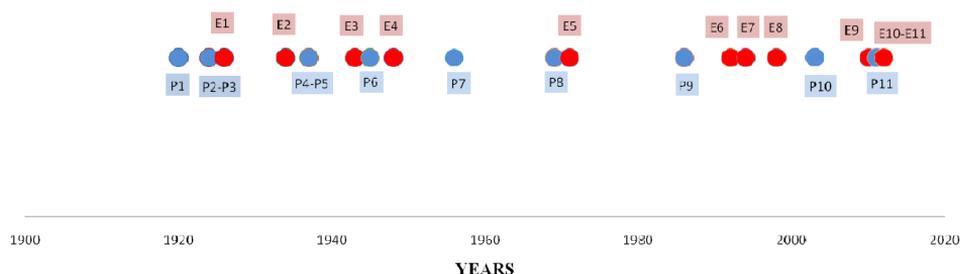


Figure 2. The historical sequence of some important events regarding forest policy and forestry education in the Turkish Republic period

<p><b>Box 2: The historical sequence of some important events regarding forest policy and forestry education in the Turkish Republic period. Çağlar, 2012; Erdönmez <i>et al.</i>, 2010; Eryılmaz, 2008; Gümüş, 2004; Özdönmez <i>et al.</i>, 1996.</b></p>
<p>P1 (in 1920): During the Turkish War of Independence, the Coppice Law was enacted according to which forest not suitable for technical forestry were given to villagers in pieces of 2 ha as coppice.</p>
<p>P2 (in 1924): Rights of villagers for harvesting in state forests were modified by a law -Law on Villagers' Right to Benefit from State Forests.</p>
<p>P3 (in 1924): Law No. 504 - Law on Technical Management and Operation of All Forests in Turkey - caused adoption of the principle of operating the forests by management plans. Pursuant to this law, the government played a regulative role in the forests not owned by the government. Protecting natural resources was mentioned for the first time.</p>
<p>E1 (in 1926): Some European forestry scientists were invited to Turkey. This had the effect that the "Forestry High School" was transformed into an independent institution, headed by a rector.</p>
<p>E2 (in 1934): By the "Universities Law", the Forestry High School was turned into a faculty format, and connected to the Ankara High Agriculture Institution.</p>
<p>P4 (in 1937): The first modern comprehensive law for Turkish forestry is Forest Law No. 3116. The most important aspects of this law were consideration of forests as one of the fundamental resources for the economy and the stipulation that forests shall be managed by the government for the common good and that the government shall have control and supervision on the forests other than state forests.</p>
<p>P5 (in 1937): The Ministry of Agriculture was reorganized and the "Organization of Forestry General Directorate Law" was put into force and a forestry organization with central and provincial establishments under control of the Ministry of Agriculture was founded.</p>
<p>E3 (in 1943): Three years of forestry education were given in Istanbul and one year was lectured in Ankara.</p>
<p>P6 (in 1945): The areas under the scope of forest regime were extended by the Forest Law No. 4785. Also, this law caused nationalization of all forests owned by real or artificial persons, associations, and the forests related to villages, municipalities, private administrations and public corporations.</p>
<p>E4 (in 1948): The Istanbul forestry faculty was connected to Istanbul University.</p>

P7 (in 1956): Forest Law No. 6831 which has been in force since 1956, which made the concept of national parks legal. This is very important for forestry and can be considered as an improvement in the conception of protected area and also determined nature protection as a new national policy aim.
P8 (in 1969): The Ministry of Forestry was founded independently for the first time. This can also be valued as one of the important stages of the Turkish forest policy development process.
E5 (in 1971): the Faculty of Forestry at the Karadeniz Technical University was founded as the second forestry faculty in Turkey. It was established in 1963, however, educational activities started in 1971-
P9 (in 1986): Law No. 3302 was issued and henceforth afforestation made by individuals and institutions was permitted. The importance of this law was related with some rights given to the individuals and institutions of forestry other than governmental organizations.
E6 (in 1992): Six further forestry faculties were established as a consequence of general politics of the government in terms of increment the number of educated people and also graduating forestry professionals which are specialized on local conditions.
E7 (in 1994): Çankırı Karatekin University Faculty of Forestry was founded.
E8 (in 1998): A reorganization of the Istanbul University Faculty of Forestry was started in 1998.
P10 (in 2003): the Ministry of Forestry was consolidated with the Ministry of Environment and became “The Ministry of Environment and Forestry”.
E9 (in 2010): Two forestry faculties (at İzmir Katip Çelebi University and Bursa Technical University) were established as a consequence of general politics of the government. The shrinking demand of the sector in terms of forest engineers wasn’t considered in the establishment process.
P11 (in 2011): The name of the forestry organization on ministry level was named as “Ministry of Forestry and Water Affairs”.
E10 (in 2012): Karabük University Faculty of Forestry was founded.
E11 (in 2013): Accreditation processes of several forestry faculties were started. Of course the Bologna Process has effects on forestry education developments. Elective courses take a larger part in the curriculum and ECTS credits are applied. However, the Bologna Process hasn’t had deep impacts on forestry education. The process has been strengthened by the accreditation processes.

With forest faculties we mean faculties generally including “Forest Engineering”, “Forest Products Engineering” and “Landscape Architecture” departments. During the last years also Wildlife Ecology and Management departments were established as parts of the Karadeniz Technical University Forestry Faculty. Also an ecotourism department was attempted to be established by Artvin Çoruh University, Faculty of Forestry.

Moreover, forestry junior colleges were established by some forestry faculties. The main aim of these colleges is training technical intermediate personnel needed by forestry organizations. In this context forestry junior colleges of the universities of Istanbul, Artvin Çoruh, Süleyman Demirel, and Bartın can be given as examples.

### **Interactions between Forest Policy and Education**

It is seen that there is a connection between forestry education-research and forest policy-organization. The reflections of the relations between the two sides in the context of related documents can be seen in Tables 1 and 2 and Boxes 1 and 2.

Forestry faculties, universities and science and research institutions are defined as important stakeholders in the documents on forest policy. Also the importance of collaboration and the necessity of coordination and communication between the institutions are highlighted. The privileged demand of the forestry sector on the education and research institutions can be categorized as (see DPT, 2007; MoEF, 2004; MoFWA, 2012; GDF, 2012):

- To educate the students on actual forestry subjects;
- To prepare and give in-service training programmes;
- To support projects on raising the awareness of the public;
- To support capacity development; (development of institutionalization, improvement processes regarding administration system, human resources, decision making, financial analysis, strengthening organizational communication etc.)
- To increase the quantity and quality of research useful for the forestry sector;
- To contribute to the planning, implementing and controlling processes in some forestry issues (protected areas, biodiversity, non-wood forest products, silviculture, public relations, forest fires, rural development, legislations, wildlife management, participatory processes, marketing, afforestation, certification, ecosystem management, biomass etc.);
- To build national networks that include the communication between the forestry based organizations;
- To organize common research and education projects and meetings.

The Turkish National Forestry Programme has the largest number of expressions related with forestry research and education (cf. Table 1). The expression “research and researcher” is the most common one among the determined expressions. It is followed by “university and forestry faculty” and “research institution” respectively. It is understood that research is the most frequently used factor in the perspective of forest policy documents in terms of forestry education and research. Also universities and faculties and research institutions are accepted as an important component of forest policy and education/research interaction. For example in this context representatives from different forestry faculties participated in the strategic planning processes. Also members of the faculties have active roles in the preparation of special reports under development plans.

Forestry institutions and organizations are accepted as one of the stakeholders in the strategic plans (SP) of forestry faculties (Table 2). Conducting common research and education projects, organizing common scientific meetings by active participation of forest faculties, forestry organizations and research institutions, contributing to in-service training activities are the prominent aspects in mentioned plans context. In some of the strategic plans, sharing the results of research with related forestry units, considering the sectoral demands, while determining research priorities and improving the cooperation on local and regional level, are mentioned.

Table 1. Distribution of key words on forestry education in selected national policy documents.

Key word	Document	Turkish National Forestry Programme	Special Report on Forestry of 9. Five Year Development Plan	Strategic Plan of General Directorate of Forestry	Strategic Plan of Ministry of Forestry and Water Affairs	TOTAL
University & Forestry Faculty (Üniversite & Orman Fakültesi)		37	13	7	12	69
Research Institution (Araştırma Enstitüsü)		35	14	12	3	64
Forestry education (Ormancılık Eğitimi)		5	12	6	2	25
In service training (Hizmet içi Eğitim)		10	9	7	9	35
Vocational high school (Meslek Yüksekokulu)		2	3	2	-	7
Science-scientist (Bilim-Bilim insanı)		17	9	6	-	32
Research-researcher (Araştırma- Araştırmacı)		78	28	13	8	127
TOTAL		184	88	53	34	359

The strategic plan of Istanbul University Faculty of Forestry, which is the longest one, scores more hits than the other investigated strategic plans. The expression “forestry organizations” is the most common expression. It shows us forestry institutions have an important place in the perspective of forestry faculties. Moreover the content analysis results show us the sectoral problems are also considered or will be considered by the faculties.

## Conclusion

Forest policy and forestry education have a deep connection, because forestry education is accepted as one of the tools of forest policy. And the technical labour demand of the sector is met by faculties. Also national forest policy aims influence the forestry education. As a result of this connection both of them affect the other. The changes in forest policy have affected forestry education: curriculum, course contents and educational system. Also the developments in forestry education influence the development of the forestry technical personnel and the improvement of scientific and research support to forest policy. Thus it is not possible to solve the problems in both arenas without mutual support.

Table 2. Distribution of key words on forestry organization in the strategic plans (SP) of forestry faculties

Key word	Documents	SP Artvin Çoruh Un. Faculty of Forestry	SP Bartın Un. Faculty of Forestry	SP Düzce Un. Faculty of Forestry	SP İstanbul Un. Faculty of Forestry	SP Karadeniz Technical Un. Faculty of Forestry	SP Süleyman Demirel Un. Faculty of Forestry	TOTAL
Forestry Organizations (Ministry of Forestry and Water Affairs Works General Directorate of Forestry Related Public Inst.) (Ormançılık Örgütleri)		6	3	1	15	4	3	32
Sectoral Policy (Sektörel Politikalar)		-	-	-	1	-	-	1
Sectoral Demand (Sektörel Talep)		1	4	1	2	-	2	10
Sectoral Problem (Sektörel Sorun)		2	4	1	8	5	2	22
Local -Regional Contribution (Yerel-Bölgesel Katkı)		3	4	2	1	1	2	13
TOTAL		12	15	5	27	10	9	78

Next to the historical developments, the actual documents related to Turkish forest policy and education also represent some important findings on this interaction. Forestry faculties and universities and science and research institutions are accepted as the privileged stakeholders (DPT, 2007; MoEF, 2004; MoFWA, 2012; GDF, 2012). Collaboration, coordination and communication are defined as important components in terms of relation of two sides in actual forest policy documents. Research is the most important factor among the issues analysed here in the perspective of forest policy documents. Furthermore universities, faculties and research institutions are approved among essential stakeholders in terms of forestry organizations. Forestry institutions and organizations are significant stakeholders in terms of forestry education and research process. This result shows that forestry institutions have an important place in perspective of the forest faculties.

Some restrictions as seen in the analyses have to be commented here. We cannot find a functioning relationship between policy and education. Although the related groups stated the other one as the main stakeholder in decision making and implementing processes, they do not necessarily consider each other's standpoints sufficiently in reality. (The representatives of forestry organizations, forestry research institutions and forestry faculties have expressed this point in lots of

occupational and scientific meetings. This is a kind of occupational public opinion). In other words, the suggestions of the other group aren't put into practice. It is clear that the results of research and opinions of scientists haven't been taken into consideration in a satisfactory level in the policy making process. Also the forestry faculties couldn't meet the expectations of forest policy and forestry organization sufficiently (Yurdakul Erol, 2010). But also the recent documents show that forest faculties and forestry organizations as the important components of forest policy started to understand and give weight to the role of each other. And it is estimated that this relation and interaction will strengthen by the time.

Effective communication, participation, innovation and collaboration are the main key factors to strengthen the interaction between forest policy and forestry education. The role of scientific knowledge and scientists should be strengthened and their advisory function should be used as one of the main guides of policy-making system.

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## THE CURRENT SITUATION OF FORESTRY EDUCATION IN THE KYRGYZ REPUBLIC

**NYRYDIN KARABAYEV AND ELINA PROKHORENKO**

### Abstract

After independence the Kyrgyz Republic had to develop its own forestry education on both vocational and university level. The latter is organized at the Department of Agronomy and Forestry in the Kyrgyz National Agrarian University. At the latter since 2009 a Bologna style BSc programme replaced the traditional one. Problems to establish a good education and the international assistance to do so are described.

Key words: Kyrgyz Republic, land use, forestry education.

### Introduction

Before obtaining independence in 1991, highly qualified forestry experts for the Kyrgyz Republic were educated at universities and colleges in Russia, Ukraine and Kazakhstan. Around that time, contracts for education were extremely costly and not affordable for many of our citizens. Hence, since 1996, forestry engineers have been educated at the Department of Agronomy and Forestry in the Kyrgyz National Agrarian University named after Skryabin (KNAU), and several qualified experts were graduated (Table 1).

Table 1: Graduates of the Forest Engineering programme at KNAU. Source: KNAU, 2001-2013.

Year	Type of training			PhD students
	full-time <sup>1</sup>	part-time <sup>2</sup>	Bachelor <sup>3</sup>	
2001	18			
2002	9			
2003	24	11		
2004	8	8		
2005	16	4		
2006	14	15		
2007	14	11		
2008	18	5		
2009	11	15		
2010	15	29		
2011	18	14		
2012	22	18	24	
2013	15	15	18	
total	202	145	42	

1: curriculum 5 years. 2: curriculum 6 years. 3. First enrolments in 2012, first graduates in 2016.

During the initial stage of education of forest engineers at KNAU the support provided by the Kyrgyz-Swiss Forestry Support Programme "KIRFOR" was important (KIRFOR, 2010). This support by "KIRFOR" was focused on strengthening of the educational and methodological framework, equipment for practical instruction and financing of special equipment to pursue academic field studies, as well as the publication of textbooks, study guides and practice guidelines.

Employees of the Department of Forestry and Horticulture at KNAU developed a new educational standard meeting the requirements of the Bologna Declaration for bachelors and masters in forestry. In its preparation, a great methodological support was provided by the Tempus-Tacis project. Now, KNAU forestry engineer graduates are greatly sought-after in the forestry sector, in colleges, vocational schools and businesses on gardening and landscaping settlements.

### Forestry in Kyrgyz Republic

Forests in Kyrgyz Republic are 1,164,000 hectares of which 12,000 hectares are irrigated, i.e. they account for 5.8% of the total land area (Table 2).

Table 2: Land uses in the Kyrgyz Republic in 2011.

Land use	Area		
	ha	%	Of which irrigated, ha
Total Area	19,995,000	100	
Total Farm Land	10,510,000	53	
Cropland	1,203,000	6.0	793,480
Pastures	9,064,000	45	29,062
Hayfield	168,000	0.8	8686
Deposits	39,000	0.2	2162
Gardens (total)	28,000	0.1	27368
Berries (total)	85		83
Vineyards (total)	5000		5008
Nursery	363		380
Plantation mulberries	2644		2636
Other crops	452		
Homestead Land	182,000	0.9	
Forest Land	1,164,000	5.8	11986
Forest plantations	463,000	2.3	8383
Marsh	6000		

The activities of the State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic are focused on a phased large-scale afforestation, especially on rain-fed, unused agricultural lands, as well as on eroded landslides and other unfavourable mountainous areas. Here, taking into account soil and climatic conditions, it is necessary to afforest not only forests but also introduce fruit tree plantations with walnut, almond, pistachio, grapes (vineyards) and apple, apricot and pear, which will significantly help in solving the food security of the

country and strengthen the financial situation of the forests. Moreover, newly established forest territories will gradually restore biodiversity and will protect the soil from erosion.

The forest areas of the Republic are excellent resources for further development of environmental protection facilities, such as state national parks and nature reservations. According to the Forest Code of 1993, our forests have a protected status only where commercial logging is prohibited. The management of these protected forests will put the emphasis on environmental, health and safety, health, recreational and other protective purposes.

Management activities in our forests are on the one hand focused on establishing high quality coniferous plantations and on the other hand on tourism, including short and longer tours for leisure travellers. Our forests protect soil from erosion, preventing mudslides and landslides. Forests are playing a major recreational role and include the largest tracts of relict walnut forests in the world.

### **Education of foresters at universities**

Therefore, educating of staff for the country's forest management is essential. Our government supports participation in international projects by highly qualified faculty members and well-equipped logistics based on KNAU. For the improvement of professional skills the faculty participates in international projects. Thus, in the framework of the Erasmus Mundus programme, one scientific training instructor was enrolled in the BOKU graduate school in Vienna. The Tempus-Tacis project assisted in the preparation of new educational programmes at KNAU.

### **Professional and vocational education**

The above is done for the education of highly qualified professionals for the forest sector. Moreover, our country pays specific attention to the training of mid-level professionals. Since 2013 the Agro-Economic Bishkek College (in 2014 renamed Bishkek Agro-Technical College) is responsible for the training of forestry technicians.

Forest workers are educated professionally and technically in 20 vocational schools (Bishkek) and 67 village schools (Gulcha). A project of GIZ (German Agency for Technical Cooperation) supports these educational activities. Today in the Kyrgyz Republic, the society knows that the training of personnel for forestry is an investment in the future development of the country.

Therefore, improving the quality of education in the above mentioned institutions of education carries great importance. Experience has shown that vocational education for forest workers now requires new ways of teaching and learning, based on the so-called social partnership. In Europe, this approach is referred to as the dual system.

Although the scope for the development of this partnership is very large, it is not yet widespread.

In Kyrgyz Republic, the training of specialists for the Kumtor gold plant – the flagship mining industry was the first to adopt this system, which guarantees school students to one hundred percent employment in well-paid jobs. It is expected that, such a programme should work for forestry too. This system allows students of vocational schools and colleges to obtain the essential knowledge and skills to meet the requirements of forestry employers.

Nowadays, the Kyrgyz Republic pays much attention to all aspects of professional training for forest workers under the scheme: basic school – vocational secondary forestry school – Colleges – University. This line is considered to be a line of connected education and is moving from teaching to learning. A modular system of training is introduced everywhere, developing a close relationship between universities, colleges and vocational-technical high schools. This is also helpful for career guidance of foresters on all levels. Thus we have provided a line of connected education from vocational, technical high schools to colleges and university.

However, a closer cooperation, among others to develop educational plans tuned with teaching practices asks still a lot of energy and input. These plans attach great importance to the education of highly qualified instructors for vocational schools and forestry colleges. For this purpose, the university curricula provide more hours on forestry disciplines themselves and – to educate these instructors – on how to teach forestry.

Education programmes for vocational forestry schools and the university are flexible, allowing them to make timely changes in their curricula based on new requirements by the labour market. This flexibility is needed to educate the necessary professionals qualified for forest management who after graduation can find employment to support the national economy.

### **Study facilities**

The Bologna Declaration implies a paramount importance to study facilities for the students among which a well equipped library with both literature (books and journals) on the one side and easy access to information available on the World Wide Web on the other. This could be, for example, similar to the library of the Technical University of Dresden in Germany. The students of this university spend quite some time in the library, which is the main educational and research unit of the university.

It is impossible for a single institution in our country to develop such a library which is functioning well. Therefore it is necessary to start immediately the work

on the development of an intercollegiate modern multimedia library. Hence nowadays the National Library (named after K. Tynystanova) develops such an up-to-date equipped centre, which can then become the main training school.

Students in the library should each have a (personal) computer, in individual working places, connected to the Internet and database libraries of universities, research institutes and the National Library. The latter will provide books, journals and electronic books from around the world. The readers should have free access (no librarian) to the books, The library should work on weekdays from 8.00 o'clock a.m. to 12.00 o'clock p.m. and on Sunday from 8.00 a.m. to 10.00 o'clock p.m.

To consolidate the theoretical knowledge of students, up-to-date equipped laboratories, field plots, and training centers at the appropriate level (e.g. vocational, professional, university) are needed. These centers could also be provided by academic and industrial research institutions, to guarantee the extensive use of the equipment, In this way the coordination between specialized universities and research institutes could be strengthened, which in turn could stimulate a scientific and educational association between these institutes (universities and Scientific Research Institute). Of course, with the use of their databases and human resources permanent courses could be organized.

### **Concluding remarks**

A fast growing and developing education system as in our country needs to examine the experiences of other countries in the creation of new types of educational institutions, up-to-date variants of curricula and programmes, and in the implementation of new contents and new technologies. So we have high hopes for the cooperation processes with the forest departments of universities in Europe.

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## **DEVELOPMENTS IN FAO ACTIVITIES IN FORESTRY EDUCATION AND RESEARCH**

**EKREM YAZICI**

### **Abstract**

Forestry education was a key focus of FAO's activities during the 1990s, but suffered a decline after the abolishment of the Advisory Committee on Forest Education in 1997. However, during recent years, FAO Regional Forestry Commissions (RFCs) and Committee on Forestry (COFO) sessions, and the XIII World Forestry Congress, have called upon FAO to re-establish its forestry education programme, potentially through an enlarged project portfolio. Taking into consideration that various regional networks of forestry education already exist and the limited staff resources, FAO activities in education could be carried out through an enlarged project portfolio and coordinated at the global level, including through the Advisory Panel on Forest Knowledge (APFK) which is under preparation.

Key words: Forestry education, Forest knowledge, participatory learning, vocational education

### **FAO approach to forestry education**

Forestry education is crucial to achieving sustainable management and national sustainable development goals. Changes in approaches to forestry education are needed as forest policies – and hence the role of foresters – evolve in response to the growing demand for forest goods and services, to the participation of multiple stakeholders in forestry and the emphasis on food security and poverty alleviation. FAO believes that the best way to support these processes is by building local or regional capacities, both through internal development of institutions and through developing and promoting relations among institutions in the forest sector.

At all levels, curricula need to be updated to include such topics as the role of trees outside forests, collaborative management, gender equity, access and benefit sharing, the impact of certification schemes and participatory learning. By the same token, foresters must be given the opportunity to acquire skills outside the traditional realm of forestry – in communication, business administration and management sciences. Efforts are also needed to monitor and assess the ability of institutions to respond as demands evolve.

At the request of member countries, FAO delivers technical assistance in formulating and carrying out activities to tackle their perceived problems in forestry education.

### **FAO's work in forestry education**

Forestry education was a key focus of FAO's activities during the 1990s, but suffered a decline after the abolishment of the Advisory Committee on Forest Education in 1997. Since that time, a number of workshops were held and publications continued to focus on the issue of forestry education. FAO has also helped many forestry schools to develop new curricula, improve infrastructure and train teachers.

The 2010 and 2011-2012 FAO Regional Forestry Commissions (RFC's) and the FAO Committee on Forestry COFO sessions (1999, 2005, 2010, 2012), and the XIII World Forestry Congress in 2009, have called upon FAO to re-establish its forestry education programme, potentially through an enlarged project portfolio. Taking into consideration that various regional networks of forestry education already exist and the limited staff resources, FAO activities in education could be carried out through an enlarged project portfolio and coordinated at the global level, possibly including an Advisory Panel on Forest Knowledge (APFK).

In this sense, an Advisory Panel seems crucial in order to coordinate complementarities from the main regional stakeholders and the value added, that FAO could contribute in the fields of forestry education and knowledge. The excellent experience of a similar body, the FAO Advisory Committee on Sustainable Forest Industries (ACSFI), encourages FAO to take action in this field and form an advisory panel drawing on their past expertise in global forestry education and research. In the Strategic Evaluation of FAO's Role and Work in Forestry, three modalities of work were identified, with the third relating to areas, in which FAO should not take the lead, but play a catalytic role by coordinating several other organizations. Such role seems the most appropriate in the case of forestry education and research.

To explore the above concepts, informal meetings of education and knowledge experts from a variety of institutions were called on the fringes of the 20th and 21st sessions of COFO. Representatives from several research and education organizations as well as FAO offices attended to informally ascertain support for the proposed APFK; agree on its scope and mandate; agree on short and mid-term actions; review the list of proposed members in order to avoid overlaps and significant gaps; and decide on further steps. General support for the concept of an APFK was expressed by the majority of participants. They agreed that the overall purpose of the body, with FAO as its Chair, would be to act as a catalyst for forestry education and research programmes, projects and other activities at the global and regional levels. Participants agreed that FAO would seek support for the APFK from its member countries and various regional stakeholders during the coming years, noting that its general purpose would be to address two complementary aspects 1) education and 2) research, and coordinate related efforts on global and regional projects and programmes. At the 21st session of COFO, in 2012, members

requested further information on the modalities and financial implications related to the establishment of a possible APFK.

Following education and research related presentations and side events at the 21st session of COFO in September 2012, draft operational guidelines for the proposed APFK were disseminated to educational experts and other stakeholders. In April 2013, on the fringes of 10th Session of United Nations Forum on Forests (UNFF10), a small group of experts provided initial feedback on the draft APFK operational guidelines and further information on trends in the forestry education field. Participants agreed to hold meetings at the regional level to gauge interest in the APFK, identify forestry education and research trends and gaps and to receive feedback on the operational policy guidelines. Follow-up meetings were also held on the fringes of the IUFROLAT Congress in San José, Costa Rica, in June 2013; during the African Forestry and Wildlife Commission in Windhoek, Namibia, in October 2013; and the Asia-Pacific Forestry Commission session in Rotorua, New Zealand, in November 2013.

In the Near East, a regional Technical Cooperation Programme (TCP) Facility project proposal was drafted to positively respond to an earlier Near East Forestry and Range Commission request for technical assistance. The TCP Facility project will address national and regional needs in forestry education, training and research, identify gaps and set priorities with the aim of promoting regional partnerships for forestry education and knowledge development. In the near term, national consultants will be selected from five countries to undertake the needs assessment and a broader follow-up workshop will be held to review the results. A similar needs assessment will likely be undertaken in the Latin American region in the near future, based on feedback received from participants at the follow-up meeting in Costa Rica.

Additional meetings on education in 2013 tapped into FAO partnerships, including at the Asia-Pacific Forestry Commission, where the Third Forestry College Deans' Meeting discussed post-secondary forestry education during a side event and launched an online forestry courses project. The FAO Regional Office for Asia and the Pacific (RAP) also continues to sponsor children's education work through its Kids-to-Forests projects. In Europe, an event formed with the assistance of partners such as the International Forestry Students' Association (IFSA) during the 2nd European Forest Week (Metsa 2013, in Rovaniemi, Finland, 2013), further explored education needs in the region.

The Forestry Department also continues to strengthen its partnership with IFSA each year under the auspices of a FAO-IFSA Agreement of Cooperation signed in December 2011. In addition to IFSA's participation at COFO events, IFSA is helping to better integrate youth activities at the World Forestry Congress in 2015.

However, even as interest and support continues to grow on the themes of forestry education and research, there is not yet one global mechanism that can help

coordinate activities and oversee new projects driven by education-related institutions at the global and regional levels. Therefore, the APFK would help strengthen forestry education projects and initiatives globally through increased coordination and greater exploration of needs in all regions supporting FAO in its catalytic role.

Based on the input from COFO, the RFC's as well as the preparatory meetings held on forestry education and research, draft operational guidelines were developed to outline main goals and objectives as well as key elements of its suggested operations and working modalities (see FAO, 2014).

Forestry education is proposed to have a high profile in the coming World Forestry Congress. If successful in engaging a considerable number of stakeholders, the discussions on forestry education can provide guidance for the future on this area. While higher education in forestry is normally in the portfolio of education ministries, professional and vocational education is normally closely linked to the ministries responsible for forests. Recent reviews have shown this area noticeably weaker, which highlights the potential role FAO can – due to the demands by member states – contribute.

### **Examples of FAO forestry education initiatives**

*The RIFFEAC network:* FAO, in the framework of the FAO-Netherlands Partnership Programme, and others [German Agency for Technical Cooperation (GIZ), the World Conservation Union (IUCN)] have supported activities of the network for forestry and environmental education institutions in Central Africa (RIFFEAC, Réseau des Institutions de Formation Forestières et Environnementales de Afrique Central) (see FAO, 2005). Most of these activities are implemented by regional members themselves, which helps stimulate the learning process. Activities have included:

- Development of a forestry training module in participatory natural resources management;
- Training needs assessment in seven countries, carried out by members of the network;
- A regional synthesis of the national reports;
- Development of Geographic Information System (GIS) teacher-training material;
- Teacher-training workshop on GIS;
- Teacher-training workshop on curriculum evaluation and monitoring.

*Kids to Forests:* “Kids to Forests” is an FAO initiative aimed at exposing school age children to the multiple benefits of forests through hands-on learning experiences that can lead to a better understanding of sustainable forest management. The initiative organizes country programmes including interactive field visits, games, activities and discussions that excite and educate students about

sustainable forest management, as well as developing appropriate educational materials. At the heart of the initiative is recognition, that education can address forestry knowledge gaps and is a key to shaping how people engage with forests (see FAO, 2105).

*Forestry education platform:* The programme is aiming to improve access to, and exchange of, information and knowledge in forestry science and technology between developing countries in Central America and the Caribbean (see FAO, 2013).

*E-Learning modules:* Good practices for forest health protection courses have been developed, with strong uptake and involvement of countries. FAO has produced in the past considerable normative material (guidelines, publications, tools). Continuous learning is an issue of growing importance due to the speed of knowledge generation and the longer active life. FAO is ideally positioned to provide, in cooperation with selected educational partners, structured distance learning material prepared to satisfy these needs (see Längin *et al.*, 2004).

### **Concluding remarks**

In conclusion, FAO believes that, throughout the world, forestry education must respond to new demands and opportunities. The best way to support these processes is to build local or regional capacities, both through internal development of institutions and through developing and promoting relations among institutions in the forest sector. FAO continues to facilitate its work on forestry education. Regional support continues to grow for FAO's proposed Advisory Panel on Forest Knowledge (APFK), which would, among other issues, help the establishment of joint projects on education with countries and partner organizations in the near future.

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## CONCLUDING REMARKS

### SIEGFRIED LEWARK

In the conference announcement we expressed our hope to bring during the conference the meaning of the paradigm shift from teaching to learning to a conscious level in the minds of the participants, and that the contributions may show how far we already made progress here in forest sciences education.

In SILVA Network conferences we are used to have our discourses mostly among teachers from faculties of forestry – even if, of course, over many years students have participated in annual conferences and especially IFSA members with their contributions.

Did the participation of student achieve more than the question which we know from curriculum commissions: now let's hear the students, what is their view on...? The contributions of the participating students are authentic: no teacher can relive the actual students' experience, he or she will always compare and think back at own experience and be sympathetic, in the best case.

The students' views will be limited in some way, as they only have their personal experience, cannot compare over time and seldom have a theoretical didactical background. From my own observations as a teacher I may add: many students do not want to reflect about the learning process, do not want to be active learners, are seldom willing to work on test assignments, as long as these activities are not obligatory. They do not find time for that, there so many other interesting things within and outside the study programme, in addition quite often they need to earn a living.

Teachers on the other hand are used to talk about teaching, also in SILVA Network conferences, about teaching approaches and experiences, curriculum development and constraints originated from the Bologna process, even their teaching philosophies. If they are interested in improving the results of their teaching activities they reflect what they are doing, how this is perceived and reacted to, what they would like to and could improve, also in reaction to results from graduates' surveys and to what they hear from students, from students' evaluations. A few of them (the "good teachers"), think and talk about the learning process and focus on the learner. But the teachers' insights into the learning process are also limited, seldom theory based, often non-professional, amateurish. One reason for that is: Quite often teaching experiences are still not rewarded in applications for positions of professors. The teachers are the experts in their respective fields of research, but seldom experts of the learning process.

That is also why most teachers do not know about the shift from teaching to learning, from the Instruction Paradigm to the Learner Paradigm. They learn on the job and react as best as they can – without theoretical knowledge, the same persons, who as researchers would never accept a research proposal or scientific text without a “theoretical framework”, forty years after the basic publication by Knowles (1975) about self-directed learning.

The new activities for raising the didactical competences in many universities, as exemplified by Jansen-Schulz at the beginning of this volume, show one promising way of changing this situation. And the following articles also demonstrate things on the move in many faculties of forestry, more or less theoretically based.

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## 150 Participants

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Lackner, Magdalena [lena.ifsa@gmail.com](mailto:lena.ifsa@gmail.com)  
Wallrisstrasse 64/2, 1180 Wien, Austria  
Austria

Lewark, Siegfried [siegfried.lewark@fobawi.uni-freiburg.de](mailto:siegfried.lewark@fobawi.uni-freiburg.de)  
Institute for Forest Utilization & Work Science,  
University of Freiburg  
Werderring 6, D-79085 Freiburg, Germany

Mühlsiegl, Reiner [Reiner@Muehlsiegl.com](mailto:Reiner@Muehlsiegl.com)  
Institute for Forest Utilization & Work Science,  
University of Freiburg  
Werderring 6, D-79085 Freiburg, Germany

Müller-Starck, Gerhard [gerhard@mueller-starck.de](mailto:gerhard@mueller-starck.de)  
Chair for Forest Genetics, Technische Universität München  
Am Hochanger 13, 85354 Freising, Germany

Pamukçu, Pınar [pınarpamukcu@hotmail.com](mailto:pınarpamukcu@hotmail.com)  
Istanbul University, Faculty of Forestry  
Dept. of Landscape Architecture  
34473 Bahçeköy-Sarıyer/İstanbul, Turkey

Paschalis-Jakubowicz, Piotr [piotr.paschalis@wl.sggw.pl](mailto:piotr.paschalis@wl.sggw.pl)  
IUFRO Task Force Education in Forest Sciences  
Warsaw University of Life Sciences-SGGW  
Nowoursynowska str. 159, 02-776 Warsaw, Poland

Pitukhin Alexander [pitukhin@petsu.ru](mailto:pitukhin@petsu.ru)  
Petrozavodsk State University,  
Faculty of Forest Sciences  
Nevsky str 58. Petrozavodsk, Russian Federation

Podrázský, Vilém [podrazsky@fld.czu.cz](mailto:podrazsky@fld.czu.cz)  
Faculty of Forestry and Wood Sciences, CULS Prague  
Kamycka 129, CZ 165 21 Prague 6 Suchdol  
Czech Republic

Prokhorenko, Elina [elina.kau@mail.ru](mailto:elina.kau@mail.ru)  
Kyrgyz National Agrarian University  
68 Mederov street, 720005 Bishkek, Kyrgyzstan

Rekola, Mika [mika.rekola@helsinki.fi](mailto:mika.rekola@helsinki.fi)  
University of Helsinki,  
P.O. Box 62, 10014 Helsinki, Finland

Remeš, Jiří [remes@fld.czu.cz](mailto:remes@fld.czu.cz)  
Faculty of Forestry and Wood Sciences,  
Prague University of Life Sciences  
Kamycka 961/129, 165 00 Prague, Czech Republic

Schmidt, Pieter [ineke\\_schmidt@hetnet.nl](mailto:ineke_schmidt@hetnet.nl)  
Chair of Forest Ecology and Forest Management,  
Wageningen University  
P.O.Box 47, 6700 AA Wageningen, The Netherlands

Schulte, Melanie [melanie.schulte@ymail.com](mailto:melanie.schulte@ymail.com)  
IFSA Technische Universität München  
Am Hochanger 13, 85354 Freising, Germany

Serengil, Yusuf [serengil@istanbul.edu.tr](mailto:serengil@istanbul.edu.tr)  
Istanbul University, Faculty of Forestry  
Dept. of Watershed Management  
34473 Bahçeköy-Sarıyer/İstanbul, Turkey

Tullus, Hardi [hardi.tullus@emu.ee](mailto:hardi.tullus@emu.ee)  
Inst. Forestry and Rural Engineering,  
Estonian University of Life Sciences  
Kreutzwaldi 56, Tartu, 51014 Estonia

Vega, Cristina [cvega@eagrof.udl.cat](mailto:cvega@eagrof.udl.cat)  
Dept. for Plant Production & Forest Sciences,  
University of Lleida  
Rovia Roure 191, 25198 Lleida, Spain

Visnjic, Cemal [vicemal@yahoo.com](mailto:vicemal@yahoo.com)  
Faculty of Forestry, University Sarajevo  
Zagrebacka 20, 71000 Darajevo, Bosnia-Herzegovina

Waraksa, Patryk [pwaraksa@gmail.com](mailto:pwaraksa@gmail.com)  
IUFRO Task Force Education in Forest Sciences  
Warsaw University of Life Sciences-SGGW  
Nowoursynowska str. 159, 02-776 Warsaw, Poland

Weber, Norbert [nweber@forst.tu-dresden.de](mailto:nweber@forst.tu-dresden.de)  
Chair of Forest Policy and Forest Resource Economics  
Technische Universität Dresden,  
Pienerstrasse 8, 01737 Tharandt, Germany

Yazıcı, Ekrem [ekrem.yazici@fao.org](mailto:ekrem.yazici@fao.org)  
FAO Liaison Office, Palais des Nations A583  
8-14 avenue de la Paix, 1211 Geneva 10, Switzerland Geneva

Yeşil, Ahmet [ayesil@istanbul.edu.tr](mailto:ayesil@istanbul.edu.tr)  
Istanbul University, Faculty of Forestry  
34473 Bahçeköy-Sarıyer/İstanbul, Turkey

Yurdakul Erol, Seçil [secily@istanbul.edu.tr](mailto:secily@istanbul.edu.tr)  
Istanbul University, Faculty of Forestry  
34473 Bahçeköy-Sarıyer/İstanbul, Turkey

Zalkauskas, Remigijus [Remigijus.Zalkauskas@asu.lt](mailto:Remigijus.Zalkauskas@asu.lt)  
Faculty of Forest Sciences and Ecology  
Aleksandras Stulginskis University  
Studentu 11, Akademija, LT-53361 Kaunas distr. Lithuania

Ziesak, Martin [martin.ziesak@bfh.ch](mailto:martin.ziesak@bfh.ch)  
Hochschule für Agrar-, Forst- und  
Lebensmittelwissenschaften,  
Länggasse 85, CH-3052 Zollikofen, Switzerland

## NON PARTICIPATING AUTHORS

Alcazar, Jorge [jalcazar@macs.udl.es](mailto:jalcazar@macs.udl.es)  
University of Lleida, Spain  
Avda Alcalde Rovira Roure 191, Lleida, Spain, E-25198

Blok, Silvia [silvia.blok@wur.nl](mailto:silvia.blok@wur.nl)  
KLV. Postbus 79, 6700 AB Wageningen, the Netherlands

Bürgi, Patric [patric.buergi@bfh.ch](mailto:patric.buergi@bfh.ch)  
Hochschule für Agrar-, Forst- und Lebensmittelwissenschaften  
Länggasse 85 CH-3052 Zollikofen

Bogunić, Faruk [faruk.bogunic@gmail.com](mailto:faruk.bogunic@gmail.com)  
Faculty of Forestry, University Sarajevo  
Zagrebacka 20, 71000 Darajevo, Bosnia-Herzegovina

Döllerer, Martin [doellerer@wzw.tum.de](mailto:doellerer@wzw.tum.de)  
Technische Universität München  
Hans-Carl-von-Carlowitz-Platz 2,  
D-85354 Freising, Germany

Iglesias-Rodriguez, Carmen                      carmen.iglesias@pvcf.udl.cat  
University of Lleida, Spain  
Avda Alcalde Rovira Roure 191, Lleida, Spain, E-25198

Lautanen, Eila                                      eila.lautanen@tts.fi  
University of Helsinki, Department of Forest Sciences  
P.O. Box 27, 00014 Helsinki, FINLAND

Lehmann, Robert                                  robert.lehmann@bfh.ch  
Hochschule für Agrar-, Forst- und Lebensmittelwissenschaften  
Länggasse 85 CH-3052 Zollikofen

Karabayev NA,  
Kyrgyz National Agrarian University  
68 Mederov street, 720005 Bishkek, Kyrgyzstan

Reisner, Vaike                                      vaike.reisner@emu.ee  
Inst. Forestry and Rural Engineering,  
Estonian University of Life Sciences  
Kreutzwaldi 56, Tartu, 51014 Estonia

Santiveri, Francisca                              santiveri@pvcf.udl.cat  
University of Lleida, Spain  
Avda Alcalde Rovira Roure 191, Lleida, Spain, E-25198

Schneider, Thomas                                tomi.schneider@lrz.tu-muenchen.de  
Technische Universität München  
Hans-Carl-von-Carlowitz-Platz 2  
D-85354 Freising, Germany

Serrano, L.uis                                      serrano@pvcf.udl.cat  
University of Lleida, Spain  
Avda Alcalde Rovira Roure 191, Lleida, Spain, E-25198

Stefke, Lia    l.stefke@gmx.de  
Pfarrgasse 16, 97259 Greußenheim, Germany:

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<b>Year</b>	<b>Location</b>	<b>Title</b>	<b>Editors</b>	<b>Published in, as</b>
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., Piusi, 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

<b>Year</b>	<b>Location</b>	<b>Title</b>	<b>Editors &amp; year</b>	<b>Published in, as</b>
2007	Freiburg im Breisgau, Germany	Design and functioning of international forestry curricula: considerations and experiences	Schmidt, P. & Lewark, S.	2008, SILVA Network Publications 5
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