

FROM EARTH TO HEAVEN: FORMATS TO ALLOW ADULT LEARNERS TO COMBINE WORKING, LIVING AND LEARNING

Katriina SCHREY-NIEMENMAA, Metropolia University of Applied Sciences, Finland

Bente NØRGAARD, Aalborg University, Denmark,

Ellen SJOER, Delft University of Technology, The Netherlands

INTRODUCTION

In a world of increasing complexity and rapid technological development, the interplay between Europe's goals of economic growth and social well-being, on the one hand, and academic expertise, on the other, is essential. It is an area where continuing education, innovation and research should come together to address the global challenges of our time. Adult learners, such as engineers working at companies or governmental agencies, have already gained a wealth of practical experience that can be built upon and used as a foundation to learn more to contribute to the innovation capacity of the organisation at which they work. A relevant educational programme at a university is an opportunity for further development and a way to gain important new insights. For the university, the flow of academic expertise gained from research is accelerated into practical application. With these continuing educational programmes they are satisfying their knowledge valorisation goals and are ensuring access to resources and real-life cases. The main benefits for companies are a head start on fellow companies, motivated and sustainable deployable employees (World Economic Forum, 2017) and a structural link with a research community.

Has this compelling proposition been realized in some of Europe's continuing educational programs? Or is it easier said than done? What role can the European University Continuing Education network (**eucen**) play? In this paper we look into three case studies from different universities from different countries in Europe that took up the challenge to develop innovative formats that allow adult learners to combine working, living and learning for the benefit of themselves, the company and the university.

In Finland the Universities of Applied Sciences have implemented Masters of Engineering programmes that require at least 3 years work experience after the B.Eng. graduation, and close cooperation with the workplace of the participant. As the Masters degree is based on the B.Eng. of 240 ECTS it is only 60 ECTS, which is the equivalent of one-year full time study. However, the studies usually take from 1½ years to 2 years as the students typically work full time in the company. The thesis work, which focuses on a subject relevant to the company / employer, covers half of the study - and thus the studies are closely tied to the needs of the company.

In addition to the thesis work, the courses cover deeper and wider knowledge from the area of the discipline of engineering. This updates the student's professional knowledge and skillset, and gives him / her an understanding of the latest research in the area. This is a great way of technology transfer.

In Denmark, Aalborg University offers a wide range of part-time Masters programmes for employed adults within a broad spectrum of academic fields. In 2016 a total of 2,225 fee-paying students were enrolled in part-time programmes among which more than 60% were social science students and only 10% were engineering students (Aalborg University, 2017a). The part-time Masters is not to be mistaken for the traditional Master of Science (MSc.) programmes, which according to Bologna is a 2 years study following a bachelor

degree. The part-time Masters programmes are specially prepared to meet the need of employees who lack competence development within a specific identified area. Admission to and extent of a part-time Masters programme is the same as mentioned above in the Finnish context: a Bachelors degree and at least two years of relevant professional experience, and the extent is 60 ECTS. The part-time Masters are aligned with Aalborg Universities' pedagogical approach centred around problem-based learning (PBL) (Barge, 2010) which means that more than half of the study-time (30 ECTS) is dedicated to solving real-life problems. These problems are often identified within the adult learners' workplace, which brings synergy to the learning environment.

In the Netherlands, TU Delft offer professionals already working in industry or governmental organisations ('contract PhD's') the opportunity to defend their PhD. These professionals who want to make a difference in their daily practice on the basis of scientific research remain stationed elsewhere. Their employers granted them part-time leave to follow a PhD program. The graduate school of TU Delft has an extended doctoral education (DE) programme. The DE Skills Training Programme offers a range of courses and activities for acquiring transferable skills, to increase disciplinary competences, develop a deeper understanding of ethics and professional integrity, and obtain research skills: activities to reach full proficiency in conducting research. Each category within the programme requires a minimum of 15 GS credits which amount to a total of 45 GS credits (1 GS credit is equal to 8 hours). PhD candidates who have completed doctoral level course work prior to starting their PhD at TU Delft are eligible for requesting an exemption (T U Delft, 2017). This case is about setting up a PhD track as a multi-year collaboration between the PhD candidate, the employer of the PhD candidate and the university. A PhD project in this context therefore entails not only the training of an individual to become a scientific researcher, but also a collaborative project in which new knowledge is developed that should lead to innovation.

The overall question is: which characteristics in the design of the programme ensure that adult learners' needs are addressed, and that they are able to combine work, life and education in the service of themselves, the employer and the university?

Case studies are considered to be useful in research as they enable researchers to examine data from real life situations, and they allow the exploration and understanding of complex issues. It is used here to describe several innovative designs and to examine the difference between the realized and the designed curriculum. Within this context, better insights are provided which will contribute to the needs of adult learners. Further, through the three cases we will show that a 'one size fits all' approach is not realistic because of the contextual differences. If we want to consider the role of **euцен** and the topics that are of importance, the (categories of) promoting and impeding factors of this research can serve as input to start the discussion at the conference.

CASE STUDY: FINLAND

The Masters courses in Engineering at the Universities of Applied Sciences in Finland are planned to directly meet the needs of working life. That means the content of the studies is applied and thus is directly relevant to and useful for daily work. However, methodological studies are also included to give the students competences to execute research; and, what is in these cases even more important, the ability to critically assess and validate research which has been done elsewhere.

In the structure of the studies the daily work schedule in a company is taken into account: lectures are mostly on two evenings of the week or intensive periods partly during the weekends. Distance education is adapted and individual assignments are used. All this helps to tailor the learning for the needs of the student and his/her employer. As an example of these courses, Figure 1 below shows the structure of an IT MEng course from Metropolia University of Applied Sciences. The purpose of this programme is to deepen the students' technical knowledge and additionally to provide them with some research and management skills.

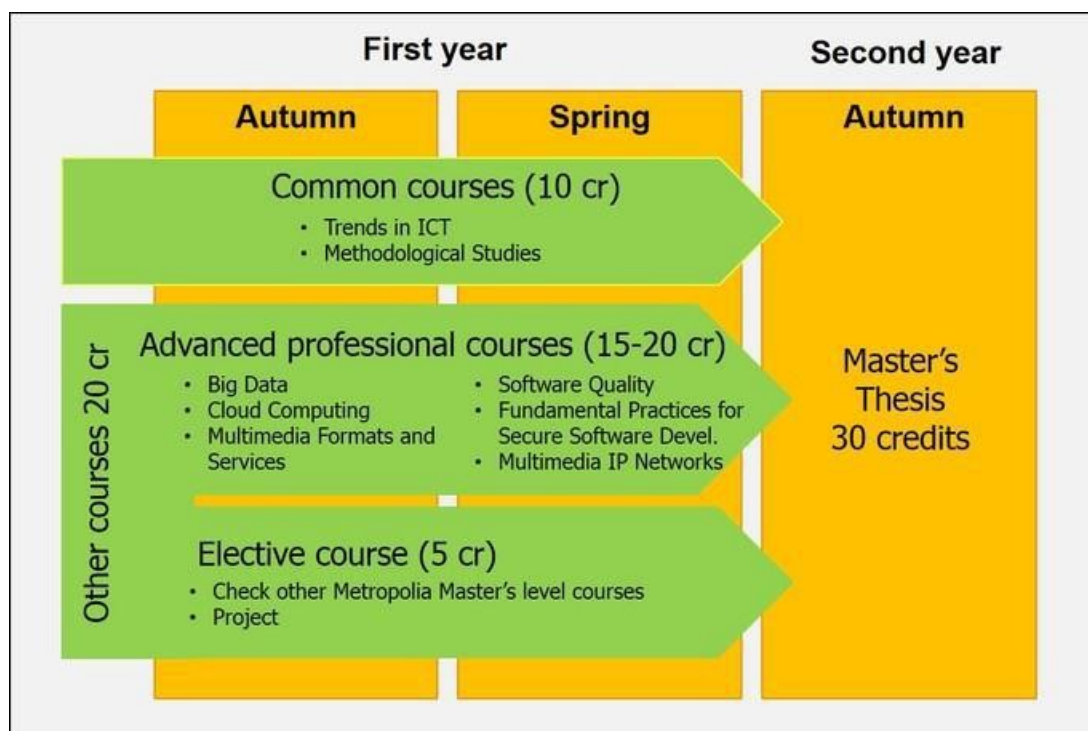


Figure 1. An example from the professional MEng course in IT (Metropolia University, 2017)

In the Masters programmes in Metropolia very much emphasis is placed on close contact with the employer. Each of the students has four coaches from the university, in addition to the coach from the company. The programme leader and coordinator regularly follow up the progress of the students. The 1st thesis coach visits the company and makes sure that the task is understood by all parties in the same way. The role of the company coach is to define the needs of the company, and based on these needs, research questions are framed jointly by the company, student and thesis coach. Furthermore the 2nd thesis coach validates the evaluation and supports the 1st coach.

This close contact between the company and university creates many additional benefits to all the parties. Teachers learn to know the companies, their products, processes and strategies, and at the same time effective technology transfer from the university reaches the company. Furthermore, these activities strengthen the base for future cooperation - the colleagues of the student might apply for the next programme, or some innovation projects for the students in Bachelors programmes might be established. Even larger development projects have been initiated through these connections.

The students of the Masters programme create a close group while they are studying. They are cross-sparring each other's work and thus supporting each other. This is an effective way to build professional networks, which will then continue after the graduation as alumni activities.

The studies are adopting the CDIO-approach (Conceive - Design - Implement - Operate) (CDIO, 2017). This means that the students are supposed to first conceive the challenges by analysing their situation until the root causes are defined. After that, they need to design different options for solutions. Implementation of the chosen solution will be followed by study of the added value of the change or new product. Furthermore, in operational phase the solution should be analysed and evaluated until the cycle begins again. In this way the whole lifecycle of the executed work is included.

CASE STUDY: DENMARK

Part-time Masters in Information and Communication Technologies (mICT)

The mICT is an international part-time Masters programme at Aalborg University designed for employed learners who work in the ICT industry and who want to keep their job while they are participating in a Masters programme (Aalborg University, 2017b). The curriculum is carefully put together to be attractive and exciting for both the ICT engineer and the ICT business professional.

The aim of mICT is to integrate students' knowledge of technology, users and markets to educate ICT professionals with both deep and broad competencies. The courses/seminars are mainly given in the evening and during weekends.

The cross-disciplinary profile addresses the growing need for ICT professionals who can combine knowledge from different areas:

- Internet, Communication and Broadcast Technologies and Converging Media
- Services and Platforms
- Development of User-friendly Applications, Solutions and Services
- Business Development and Business Models
- Security, Trust, Privacy; Legal and Ethical Aspects
- Organisational aspects of ICT

The programme is provided in three trimesters, where a trimester in the full-time (one year) version of the education is equivalent to four months, in the part time (two years) version is equivalent to eight months and in the part time (three years) version is equivalent to one year.

The programme covers 3 main areas (Aalborg University, 2017c):

- Networks and services
- Design and users
- Market and regulation

	1ST TRIMESTER THEME: ISP: SERVICES AND PLATFORMS CIS: ENTERPRISES CYBER SECURITY MII: ORGANISATIONS AND INNOVATIONS	2ND TRIMESTER THEME: ISP: APPLICATION DEVELOPMENT CIS: PRIVACY & SECURITY FRAMEWORKS IN ORGANISATIONS MII: SERVICE DESIGN	3RD TRIMESTER THEME: MASTER'S PROJECT
Courses	10 ECTS	10 ECTS	5 ECTS
Project	10 ECTS	10 ECTS	15 ECTS
Total	20 ECTS	20 ECTS	20 ECTS

Figure 2. The Part-time Masters (mICT) (Aalborg University, 2017c)

The mICT programme is taught via extensive use of IT-supported distance education tools such as interactive courses with web-based support, platforms for group collaboration, Moodle and other support. However, at the seminars, courses are taught face-to-face, and teachers are facilitating learners' project-work. In addition, learners are encouraged to engage in dialogues with fellow participants (peer-learning).

The pedagogical approach is Problem-Based Learning (PBL), an internationally recognised method of active learning through problem solving. Key components also include

- Flexible knowledge
- Self-directed learning
- Intrinsic motivation
- Collaborative skills

More than half of the programme content is project work (35 ECTS), and the other half is made up of taught courses. The extensive amount of resources dedicated to project work allows the learners to identify, analyse in-depth and solve real-life problems which might have been identified within the workplace of the learner or in collaboration with management, or even to address problems of strategic relevance to the company. From a learning perspective, the context of the problem has to be as authentic as possible; and if the context is the learners' workplace – the criteria for relevance must have been fulfilled.

CASE STUDY: THE NETHERLANDS

TU Delft acknowledges the doctorate as a key instrument to address the increasing complexity of society. The core of the PhD programme is the PhD candidate's research project. This is supported

by a supervisory team, PhD mentor, progress meetings and the Doctoral Education programme. A full-time PhD research project usually takes 4 years. In order to stay on track each PhD candidate has several mandatory progress and evaluation meetings with his or her supervisory team. During the PhD project, candidates will not only focus on their research but also on personal and professional development. This development is mainly facilitated through Doctoral Education. In the Doctoral Education programme each PhD candidate is required to take part in courses which support the development of their knowledge in the field of their specific research, as well as courses in personal and professional development (T U Delft, 2017b).

However, although the theses of contract PhDs must meet the same requirements as the fulltime PhD candidates at TU Delft, this format for a PhD programme is not eligible for contract PhDs. The Delta Infrastructures & Mobility Initiative (DIMI) and Delft Energy Initiative (DEI) at TU Delft have launched a pilot for a collaborative PhD track within the graduate school for contract PhD candidates. This collaborative PhD track contains a preparatory phase in which the candidate discover what a PhD trajectory requires, and what the differences are between the world of practice and that of science. Furthermore, a company supervisor will be added to the guidance team, next to (usually) two supervisors from the university, one of which is the promoter and the other usually is the daily supervisor. The company supervisor will in particular support the application of the results in practice. Furthermore, time allocation, funding and intellectual property rights should be discussed before starting a PhD track. Finally, once started, the focus of contract PhDs is much more on research related skills (such as research design, how to make a questionnaire, discovering statistics, etc.) than on transferable skills for personal development (Sore and Hertogh).

CONCLUSIONS

Common to all of these programmes in three different universities is that they take the content and purpose of the learning from real working life needs combined with individual motivation. However, the pedagogical angle to the studies can be different. Furthermore, strong support and coaching both from the employer side and university side enables students to carry out the studies within the expected timeframe.

The 60 ECTS study programme organised in a timeframe of mostly 3 semesters is possible to complete due to the convergence with the students' every-day work. The aim is that the students should be able to include tasks from their work-life into the education, which can be time-saving for the student since the task also is part of his/her work. Also, this close relationship to the students' work gives birth to work related benefits, which to some students are the motivation for study.

During the studies students are encouraged to form groups to work on assignments and projects; in the long term, this can create valuable relationships and professional networks which can be very useful e.g. in regard to the learners' long-term career planning. The programme also brings the possibility for university academics and professionals in the field to establish long-term relationships, which can bridge the gap between universities and companies.

REFERENCES:

- Aalborg University (2017a) *FTE students on part-time programmes*, available at <http://www.en.aau.dk/about-aau/figures-facts/students/part-time-programmes/> (Accessed 7th March 2017)
- Aalborg University (2017b) *Curriculum for the Master of Information and Communication Technologies*.
- Aalborg University (2017c) *Master in Information and Communication Technologies (mICT)*, available at <http://www.en.aau.dk/education/continuing-education/master/information-and-communication-technologies> (Accessed 8th March 2017)
- Barge, S. (2010) *Principles of Problem and Project Based Learning: the Aalborg PBL model*. Harvard University, prepared for Aalborg University. CDIO, www.cdio.org
- Metropolia University of Applied Sciences (2017) *Information Technology: Masters degree*, available at <http://www.metropolia.fi/en/apply/studies-adult-education-technology/information-technology-meng/>
- Sore, E. and M. Hertogh (to be published) *Collaborative PhD Tracks: Working Together for Sustainability*.
- T U Delft (2017a) *Doctoral Education Programme*, available at <https://www.tudelft.nl/onderwijs/opleidingen/phd/doctoral-education-programme-de/> (Accessed 16th June 2017)
- T U Delft (2017b) *Doing a PhD*, available at <https://www.tudelft.nl/io/onderzoek/graduate-school/doing-a-phd/> (Accessed 16th June, 2017)
- World Economic Forum (2017), White Paper on *Realizing Human Potential in the Fourth Industrial Revolution: An Agenda for Leaders to Shape the Future of Education, Gender and Work*.