

BENEDEK, András – JAAKKOLA, Pirjo

Towards a Common Development in Teachers' Education in VET A Cooperation between the Technical University of Budapest (BME) and the Tampere University of Applied Sciences (TAMK)

1. The institutional frame of cooperation

1.1. *Brief history of teacher education at BME*

In Hungary, teachers are currently trained in 15 higher education institutions at different (bachelor's and master's degree) levels. These institutions may be classified into various groups according to their general orientation (engineering, economics and agriculture) or the specific professions they target. The Technical University of Budapest (BME) has a unique status among them, due to both its history and its renewed training profiles serving vocational teachers.

The history of the Department of Technical Education has been closely related to that of the university over the past 100 years. The training of teachers specialized in engineering has been part of our activity for about 125 years, more or less continuously. Between 1870 and 1894 a teacher training institute was operated by the legal predecessor of BME, the Joseph Polytechnic (József Politechnikum). Between 1934 and 1948, the Institute of Education was founded and operated in the framework of the Palatine Joseph University of Technology and Economics (József Nádor Műszaki és Gazdaságtudományi Egyetem), which specialized in engineering and economics. In 1961, the Department of Education was founded within BME and reorganized as a Department of Teacher Training and Education in 1971. In 1995, when the departments became independent within the institution, the Department of Technical Education was established to train teachers of engineering. Since 2005, the department has been operating as part of the Institute of Applied Education and Psychology. The spectrum of the training offered at BME covers almost every theoretical and practical field relevant to teachers of engineering and economics, allowing for the admission of trainees from all over the country representing an increasingly wide range of vocations.

In Hungary, the role played by vocational training institutions in the education of teachers is based on a history that goes back several decades; in some cases even of centuries. Teacher training services cover a wide range of subjects in locations throughout the country. The vocation-related training of vocational teachers started more or less at the same time as their university education, about 140 years ago when this type of training was conducted at the same educational level as the training of teachers for general education. Over the last 25 years, it has become the more or less universal practice for engineers and economists with the relevant university degrees to acquire their teaching degree (MA) in the framework of part-time education.

1.2. Brief history of teacher education at TAMK

The history of vocational technical colleges in Finland dates back to the year 1912, when the first technical college was established in Tampere. This can be considered as the very first step towards the TAMK Ltd that exists today. Technical colleges, as well as colleges and institutions operating in other fields, were merged into larger multidisciplinary Universities of Applied Sciences, at first with a temporary operating license in 1992. All temporary Universities of Applied Sciences were required to implement the active development of their functions and, on the basis of the results, were granted permanent operating licenses. TAMK received permanent status in 1996. The owner of TAMK was Tampere city. In 1997, the neighbouring Pirkanmaa University of Applied Sciences (PIRAMK), which was formed by merging 10 upper secondary level vocational institutions in the Tampere region, received a temporary operating license and was granted a permanent license in 2000. PIRAMK was a limited liability company owned by a consortium including Tampere city. At the beginning of the year 2010 the two Universities, TAMK and PIRAMK, united and took the name Tampere University of Applied Sciences. The new combination is the second largest University of Applied Sciences in Finland. At the beginning of 2015, TAMK became a limited liability company: TAMK Ltd.

Teacher education first started in Finland as early as 1806 in the Turku Academy, but became better established from 1864 onwards. Vocational teacher education started in TAMK, or rather its predecessor the Tampere Institute of Technology, in 1988 in the form of training for teachers in technology. Vocational teacher education for technology teachers took place in an autonomous national education centre for institutions of technology in the whole country functioning as a department of the Tampere Institute of Technology. In 1996 vocational teacher education was reorganized in Finland so that the five Universities of Applied Sciences were made responsible for training vocational pedagogical teachers and all the earlier 19 subject-oriented teacher education institutions were dismantled.

At present in Finland teacher education is provided by both academic universities and universities of applied sciences. Academic universities are responsible for general teacher education from kindergarten and primary school levels to upper secondary subject teachers and they also provide training for teachers working in adult education. Vocational teacher education is provided by five Universities of Applied Sciences, one of which is TAMK. Vocational teacher education in these five Universities of Applied Sciences consists of pedagogical training programmes that ensure the statutory pedagogical qualification for teachers in vocational and higher vocational institutions (VET and Universities of Applied Sciences), but the qualification is also valid for upper secondary school teachers as well as for teachers in adult education centres and various third sector educational institutions. It is characteristic of the Finnish vocational teacher training offered by Universities of Applied Sciences, including TAMK School of Vocational Teacher Education, that it is not oriented towards the learning and teaching of specific subjects but concentrates purely on pedagogy; thus individual student teachers in the same group represent a number of different fields and work together to build their identities as teachers.

Special features of the Hungarian system

In Hungary, teachers of theoretical subjects in formal vocational education are required to hold an MA degree in teaching while those involved in practical training (vocational teachers in agriculture, engineering or business) must hold a BA degree in teaching. Vocational teachers (agricultural engineers and economists who work as teachers, teachers of engineering subjects and vocational trainers) traditionally play an essential role in determining the efficiency of vocational training and as such they need continuously updated training contents and methods. The contents and methods of vocational training need to be continuously adapted to technical, technological and economic developments.

Vocational teachers – of both theoretical and practical subjects – are only trained in the framework of higher education. At the level of central regulation the curricula and the forms and methods of evaluation for vocational teachers are developed by higher education institutions in accordance with the training and output criteria of the individual faculties, which in turn are defined by the relevant decrees issued by the Ministry of Education. Those teaching general subjects and theoretical or practical vocational subjects are required to hold a tertiary (ISCED 5A) teaching/training degree. Teachers participating in practical training at commercial organizations are required to be qualified in the given vocation (at least at the level for which they provide training) and to have 5 years of professional experience.

New directions in Hungarian VET development

Recently in Hungary, the development of dual vocational education has become an important principle in renewing the vocational training system. The recent Act on Higher Education (2011) re-introduced the former undivided system in the training of teachers in a 4+1 or 5+1-year structure. The quality of education is essentially determined by the teachers involved. Their career options, including the system of social and financial remuneration, needs to be made predictable and susceptible to planning.

Hungarian vocational teacher training means part-time postgraduate education. The 150-credit teacher training programmes are composed of 3 modules: vocational training focusing on the development of educational and methodological skills; education and psychology in theory and practice; and a period of teaching practice carried out in a public or adult educational institution. Undergraduate teachers are evaluated by various means including exams, teaching practice assessments and the final practice assessment known as “the observed lesson.”

In Hungary, the responsibilities of teachers are defined at the highest level of legislation. Accordingly, one of the duties of teachers is to guarantee the development of the personality and talents of the children by means of educational activities and to do everything that can reasonably be expected to fulfil this task, while always respecting the individual capabilities, skills, development rates and social and cultural status of the children. A priority task of the teachers is to care for children with special needs on an individual basis. In Hungarian vocational education, vocational teachers may teach in both formal and non-formal settings, so they should be prepared to meet the needs of educating young adults, adults and students with special needs in addition to the 14-18 age group.

Developmental role of BME in the field of VET

When developing vocational training concepts, a personalized approach is generally applied. Vocational training has a unique position in progressive educational systems, particularly because the duration of training is much shorter than in non-vocational programmes. This uniqueness emerges in the way vocational programmes prepare students for the social division of labour in the broadest sense. In this dynamic process, the currently existing progressive elements (e.g. the penetration of IT solutions and the general application of bio-technology) and the potential new developments which are most likely to occur (e.g. changes in the energy structure) serve as mechanisms of creating a modern vocational structure.

An important direction in the international development of educational content and methodology is the creation of open curricula where those actively participating in learning can contribute constructively to the process of development. Another characteristic feature is mass access to contents, supported by efficient modern online platforms. Currently, this approach is most innovatively applied in higher education (MOOC – Massive Open Online Courses); however, the large number of students in vocational education as well as their increasing age and the diversity of their professional options urge the systematic adoption of these solutions.

Research at the Department of Technical Education at BME essentially focuses on the differentiated management of the in-class activities of vocational teachers and the application of efficient educational methods and procedures. Based on this research, the general criteria of training teachers are partly conventional, related to knowledge, skills, and attitudes and partly related to the following teaching skills:

- developing the students' personalities through, personally tailored programmes;
- supporting and developing student groups and communities;
- vocational training methodology and vocational knowledge;
- planning the educational process;
- supporting, organizing and controlling learning;
- evaluating educational processes and students;
- communication, professional cooperation and career identity;
- commitment to and responsibility for professional development

The orientation framework for development is the networking concept, a typical feature of vocational training which is now also penetrating teacher training. This project encouraged teacher training institutions to "learn" in an environment where information exchange organized into an informal network supported by IT devices had an increasingly important role. The essential core of the concept is participation in the network, and access to information as well as to the software packages that are able to interpret information in various contexts, and the promotion of co-operative and self-organized learning. Accordingly, a priority objective of Hungarian projects is to develop new networks of institutions and partners involved in teacher training and to create new nodes (knowledge elements) and edges (functional links). In the spirit of this approach, the focus should be shifted towards the "network" of individuals and learning.

3. Pedagogical philosophies of TAMK Vocational Teacher Education

Characteristic features of TAMK vocational teacher education (TAOK) are a participatory and collaborative way of working and a competence based approach. The teacher's role has changed dramatically, from providing information towards acting as an enabler of education and designer of learning environments. We can also describe the paradigm change as being from "teacher" to "facilitator." Student teachers are encouraged to work together in building their identities as teachers. Training is carried out in peer groups of 5 to 6 student teachers who interact with each other in choosing the issues they wish to study and deepening their knowledge and skills. So they not only study relevant areas of the teaching profession but also make decisions about which areas they consider relevant in their personal paths towards that profession. The assignments are open-ended, providing a framework for work rather than demanding the accomplishment of discrete, individual tasks. Collaborative decision making and knowledge building are among the key factors in TAOK teacher education. The collaborative way of studying in peer groups means that the education becomes personalized. Each small (peer) group ends up following a different study path. Personalization is important also in the way that an individual student teacher can plan his/her own studies. Earlier learning and competences acquired in working life can be accredited in the studies through a system for the recognition and accreditation of existing competences. Also, each student works out an individual curriculum which is based on the TAOK curriculum but tailored to meet the needs and the situation of the individual concerned.

The collaborative way of working is also manifested in the way that TAOK teacher trainers work. Facilitation of the teacher students' learning processes happens in teacher teams. Each teacher trainer is responsible for about 30 student teachers, who are subdivided into the peer groups. Teacher trainers collaborate in teams in the planning and implementation of the whole facilitation process. These teams have learnt by experience to be effective and flexible. The different teacher teams also exchange ideas and experiences with each other. Much of the practical development concerning ways of working and good practices takes place in the teams.

Cooperation with institutions and organizations outside TAMK is vital for the success of teacher training. Authenticity in learning is ensured by working in very close cooperation with the different educational institutions in the Tampere region and elsewhere in Finland. International cooperation is also growing in scope and significance.

TAOK applies participatory pedagogy. The curriculum based on participatory pedagogy is flexible and gradually finds its final form during and throughout the learning process. The aims and objectives are not given but are created through action. The student teachers are encouraged and helped to engage their own organizations in the new approaches learned during their teacher training and they are also encouraged to become involved in various activities, organisations and institutions important in the teacher's work. This is supported by involving various communities and experts from the world of work in the learning process and in evaluation. Participatory pedagogy is an extensive approach where different pedagogical strategies are combined. It utilizes many different activating, exploratory and problem- and phenomena based pedagogical models and methods.

3.1. Evaluation and assessment

Competence-based teacher education requires a holistic approach to phenomena rather than separate subject areas and individual tasks to learn them. Competences are described in the TAOK curriculum, along with criteria for assessing and evaluating the learning process and outcomes. TAOK has created a three-step set of criteria for the evaluation of the learning processes and outcomes. These criteria are applied in self-evaluation and peer evaluation as well as in trainer evaluation. They help the students not only to measure their progress but also to articulate the essential features of the teachers' profession and student teachers' personal aims and objectives in the profession and in the learning process. Competence based learning puts great emphasis on evaluation and assessment because the traditional formative and summative examinations are not applicable. When they enter the programme the teachers constitute a very heterogeneous group in terms of their level of knowledge and competencies in teaching and facilitating learning processes. Evaluation concentrates on progress rather than on the final level of competences and knowledge. Evaluation is an integral part of the learning process: it is always individual, mostly verbal and orientated towards the future. In the work which supports identity building the goal of evaluation is to support the student teachers' experience of how they can have an impact on setting the goals, working and evaluation.

3.2. Programmes and structures

The TAMK vocational teacher education programme admits about 300 trainees yearly in three different programmes: vocational teacher, vocational special needs teacher and vocational study counsellor. The latter two are further education programmes that require an existing teachers' qualification. In Finland vocational teacher education is offered in five Universities of Applied Sciences. They provide a 60-ECTS programme leading to the statutory pedagogical qualification that entitles the teacher to be employed as a vocational teacher in Universities of Applied Sciences and vocational institutions (VET), and also to the qualification to teach in general education at secondary level, as well as in tertiary education and training. The applicants must have a suitable University degree and a minimum of three years' work experience in their own field (not in teaching) to be eligible. Vocational teacher education focuses on pedagogy and does not include subject-related content. As a result, the peer groups of student teachers may consist of people from many different subject fields who work collaboratively, building their identities as teachers together. Their studies include pedagogical sciences, vocational pedagogy, practical training and elective studies. The structure is modular. The students prepare a handbook about being a teacher which constitutes a kind of portfolio of the process of joining the profession. Studies normally last 1.5 years but depending on the individual they may be shorter or longer.

3.3. Blended learning

The education takes place in a blended learning mode with contact sessions about once a month. Most of the work is done via the web and also in synchronous video meetings with either the whole group or the small peer groups present. In TAOK, online learning in teacher

education utilizes versatile social media platforms, virtual spaces, and digital tools. The official learning platform is Moodle-based but most of the work happens via the open social media such as Facebook, Google+, Elide my, Blogspot, WordPress, WhatsApp, etc. In the video meetings of the various groups several tools are in use: AdobeConnect, Skype, Zoom, Google hangout, etc. In TAOK, we monitor and test different emerging new social media tools to obtain relevant experience and to keep up-to-date on what is available on the web concerning learning processes. Online working and video meetings are frequently used in international cooperation when physical travel is not possible or would be too time-consuming.

3.4. Pedagogical research, development and innovation and further education

The aim of pedagogical RDI is to develop professionally oriented education and pedagogy. This is achieved by running different development projects in close collaboration with national and international partners. Besides projects, TAOK is also involved in pedagogical research in areas such as student experience and professional identity.

An on-going and continuous further education programme is the way for specialists to achieve competence-based qualifications. In addition, TAOK runs a selection of further education programmes in the field of pedagogy nationally as well as globally, each tailored to the client's needs. Vocational teacher education relies heavily on research in developing the contents and methodology of education and training both in vocational teacher education and throughout TAMK. TAMK has a publication series, TAMK journal, where pedagogical research papers are published alongside vocational and scientific papers and conference proceedings. The significance of pedagogical RDI is evident in the fact that for two years now pedagogical RDI has had its own management under the leadership of Hanna Ilola. Pedagogical research, development, and innovation activities are growing areas in TAMK and TAMK has founded a separate research group to conduct them with the head of pedagogical RDI group in charge. Thus, the emphasis on pedagogy has become stronger in the recent years in TAMK. At present the research profile is focussed on teacher identity and student experience but a variety of research projects are being conducted in areas of interest and also as indicated in various funding instruments both nationally and internationally.

4. Cooperation with the Tampere University of Applied Sciences (TAMK)

Higher education has become strongly internationalised during recent decades. For BME, the cooperation between BME and TAMK which has taken shape over the last two years is a fine example of this tendency. Traditional contact building was followed by an exchange of teachers and study tours, as a result of which a cooperative programme consisting of several elements started in the autumn of 2015.

The study tours led to the recognition of several common factors in vocational teacher training which are listed in a joint Memorandum issued on 29th October 2015. The main activities that are envisaged, still in the phase of organization, are as follows:

- A one-week further training programme for teachers (in April 2016) in the framework of which 20 Hungarians attending a specialized further training course in public education leadership will study the Finnish education system and its management system at institutional level, as well as the specifically Finnish characteristics of initial and further teacher training in Tampere. One of the important features of this project is that prior to the actual training week the students will attend an on-line supported distance course in March, while still in Hungary. They will have the opportunity to get to know the background materials and to make preliminary contacts with their colleagues in Tampere, which will enable the programme to be adapted to their real fields of interest and to be made as effective as possible. After the visit to Finland, their experiences will be developed within similar frameworks using Moodle systems in order to support the long-term utilization of the learning results. We hope that this pilot programme will prepare the ground for further common programmes in both countries.
- Potential cooperation in elaborating a Horizon 2020 project proposal in accordance with the specific features of the training portfolios. Vocational teacher training and the development of an entrepreneurial culture constitute topic frameworks in which both institutions possess a theoretical and empirical background, which means that there are excellent opportunities for initiating common projects.
- Research cooperation between BME and TAMK. The distinct identities of the two institutions and their different approaches to the management of problems in the actual practice of vocational teacher training do not preclude the possibility of starting a common research programme. The next preparatory step is a research symposium to be held in Budapest in the spring of 2016, the professional programme of which is currently being worked out.

To sum up, a glance at the main frameworks of cooperation, which include a variety of professional contacts, makes it clear that the cooperation we have initiated challenges real problems, considers mutual interests and can be perfectly constructed from both professional and operational points of view. In future decades it will hopefully serve as a fine and instructive example for other European training institutions to follow.

References

- András Benedek - György Molnár: E-teaching and Digitalization at BME. In: New Technologies and Innovation in Education for Global Business: 19th International Conference on Engineering Education – PROCEEDINGS. Zagreb, 2015.07.20-2015.07.24. (University of Zagreb, Faculty of Economics & Business) Zagreb: Zagreb School of Economics and Management, 2015. pp. 349-356. (ISBN:978-953-246-232-6).
- András Benedek -György Molnár: ICT in Education: A New paradigm and old obstacle. In: The Ninth International Multi-Conference on Computing in the Global Information Technology. Arno Leist, Tadeusz Pankowski (szerk.) Sevilla: IARIA, 2014. pp. 54-60. (ISBN:978-1-61208-346-9).
- András Benedek, György Molnár, Supporting the m-learning based knowledge transfer in university education and corporate sector, In: Prof Inmaculada Arnedillo Sánchez, Prof Pedro Isaías (Ed.) PROCEEDINGS OF THE 10th INTERNATIONAL

CONFERENCE ON MOBILE LEARNING 2014. Konferencia helye, ideje: Madrid, Spanyolország, 2014.02.28-2014.03.02. Madrid: IADIS Press, 2014. pp. 339-343. (PROCEEDINGS OF THE 10th INTERNATIONAL CONFERENCE ON MOBILE LEARNING 2014) (ISBN:978-989-8704-02-3).

- András Benedek, György Molnár, Zoltán Szűts, Practices of Crowdsourcing in relation to Big Data Analysis and Education Methods, In: Anikó Szakál (Ed.), SISY 2015: IEEE 13th international Symposium on Intelligent Systems and Informatics: Proceedings. 329 p. Konferencia helye, ideje: Subotica, Szerbia, 2015.09.17-2015.09.19. Subotica: IEEE Hungary Section, 2015. pp. 167-172.
- Curriculum 2015 Vocational Teacher Education, TAM.
- Maija Kärnä, Pirjo Jaakkola, Päivi Lehtonen: Social Media Challenges Vocational Teacher Education in Finland, Tampere University of Applied Sciences School of Vocational Teacher Education, International Conference The Future of Learning 4th Edition, Florence, Italy 2014.
- Harri Kukkonen: Positioning as a Means of Understanding Curriculum p.161-178
- TEACHER EDUCATORS and TEACHERS as LEARNERS - INTERNATIONAL PERSPECTIVES (edited by Pete Boyd, Carl Isle, Agnieszka Szplit, Zuzanna Zbróg) Kraków, Poland 2014.
- György Molnár: Modern ICT based teaching and learning support systems and solutions in higher education practice, In: Milan Turčáni, Martin Drlík, Jozef Kapusta, Peter Švec (ed.): 10th International Scientific Conference on Distance Learning in Applied Informatics. 654 p. Štúrovo, Szlovákia, 2014.05.05-2014.05.07. Praha: Wolters Kluwer Law and Business, 2014. pp. 421-430. (ISBN:978-80-7478-497-2).