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ANTÓNIA BEREZ

The Process of E-teaching-learning – Strategies and Models

Author's Summary of the PhD Dissertation

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DESCRIPTION OF THE SCIENTIFIC PROBLEM AND RELEVANCE OF THE TOPIC

In the 21st century social technology development forces the education system to modernize, with particular attention regard to the increasing popularity of e-learning processes and the spread of distance learning in higher education, including military higher education. Educational renewal can only be successful if we apply planned fastest growing toolkit of the IT at all levels of the education system and in all forms of education.

Interactive knowledge transfer can be implemented more effectively with the support of electronic IT tools in the teaching-learning process, while the teaching strategies of the instructors and the learning strategies of the students also are changed in the e-environment. Therefore a wide range of e-learning models have been created and therefore e-learning has been incorporated into the strategy of educational institutions. There are being developed as many e-learning models as many teachers, or as many e-learning strategies as many schools are. Therefore, e-learning models and strategies are being published in a very large number for the electronic support of teaching-learning process. The main topic of my research is an overview of the ever-expanding, diverse world of e-learning strategies and models, and the development of systematizing principles and methods for review them. My new theoretical and practical models are supported them.

The aim of the professional literature and legal background research in the dissertation is to provide a comprehensive picture of the international perception and requirements of the transformation of the distance learning process too. It should be considered that, as a member state of the European Union, because the EU2020¹ objectives have transformed the Hungarian external and internal conditions, i.e. it was necessary to renew the entire Hungarian higher education institutional system. The most important strategic objectives of this are set out in the CCVI 2015 National Higher Education Act.

¹ EU2020: Europe 2020 strategy, https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/framework/europe-2020-strategy_hu, visited on September 1, 2018.

HYPOTHESES FOR RESEARCH

I have set up the following hypotheses to carry out the research.

Hypothesis 1: Using the results of other disciplines, further new theoretical and practical teaching-learning models can be developed, which can be used for military and civilian higher education, as well as for further training in government and municipal institutions. – Linked to research objective 2.

Hypothesis 2: E-learning strategies can be integrated into a system based on appropriate organizing principles, covering the full range of possible strategies. – Linked to research objective 3.

Hypothesis 3: E-learning models can be integrated into a system based on appropriate organizing principles that cover the full range of possible models. – Linked to research objective 4.

Hypothesis 4: There is a need to create a model which uses e-tools, through milestones of project work, became members of a small community and be motivated students to unfold their talents; this model is particularly effective and efficient. – Linked to research objective 5.

RESEARCH OBJECTIVES AND PERFORMED TASKS

I focused my research on the e-teaching-learning process of higher education, with special regard to engineering and military engineering higher education. The complexity of the research problem that I defined requires researching for a lot of its parts, which are worth exploring. From those problems I defined the following as research objectives and to accomplish them set tasks.

Research objective 1: literary review of e-learning. First I had to study the possibilities of modeling teaching-learning processes. Then I had to review the literature on e-learning and new forms of learning, paying special attention to adult education. Finally, from the point of view of my topic, it was essential to analyze the teaching-learning strategies of adult education.

Research objective 2: to prove hypothesis 1. Because I had not found theoretical models emphasizing properly the importance of the human factor in my opinion, I made task of creating new ones. On the one hand, I paid attention to models designed to demonstrate the development of e-learning, and on the other hand I had to find ways to use the results of other disciplines to create new e-learning models. Finally, as a task, I also determined to confirm the importance of the human factor with practical research, too and at the same time to study of e-tools and teaching-learning strategies currently used, for which I marked out to carried out a sample research as a snapshot of the e-learning attitude of teachers and students in higher education institutions in Hungary.

Research objective 3: to prove hypothesis 2. In this context, I was tasked creating a system by defining systematic principles, creating categories, and giving examples to them along a logic that I consider appropriate in an expanding, diverse world of the e-learning strategies. In addition, as a task, I also set up to create a snapshot of the e-learning strategy of the Hungarian higher education institutions on the basis of the current Institutional Development Plans, as well as to collect the e-learning content service of the institutions, and to carry out an assessment of the teachers' and students' awareness and opinion of their strategy and e-learning strategy.

Research objective 4: to prove hypothesis 3. In my main task, I marked the development of a method that I consider appropriate to organize e-learning models in the expanding and diverse world of e-learning models, and to support by examples the systematization. I marked to support the practical use of the system by publishing it in an easy-to-use form on the Internet. As a further task, I determined to review the teachers' knowledge of the e-learning models and their own e-learning models, as well as the students' views on the Dennis Gabor College's (DGC) e-learning.

I had to do self-reflection on a continuous basis, and to gain knowledge as an observer attending to the colleagues' lectures and to utilize the discussions on our e-learning models at informal conversations and professional conferences.

Research objective 5: to prove hypothesis 4. It was my job to develop and formulate the basic concept of a model supporting the emergence of motivated students' talent using the professional literature and my experience in the field of Talent Management. In addition, I had to familiarize with the concept and to apply it in practice as a member of a student-teacher community from 2010. Finally I had to present the effectiveness of the model and the results achieved with the help of the model, and to assess the students' satisfaction about the model.

I wanted to use my previous research results and publications to achieve above research goals.

THE APPLIED RESEARCH METHODS

In order to design and conduct my research process, I narrowed my research area within the area of e-teaching-learning, strategies and models, and then set up hypotheses. Then I defined the concepts to be studied in conceptualization², their characteristics and the structure that they are composed of.

“According to their typology, three main trends can be distinguished in today’s educational practice: the theoretical, qualitative approach (»the humanities approach«), the quantitative scientific method (»the science approach«) and the research focusing on system development (»the engineering approach«)” (Bertalan Komenczi, 2013 [1, pp. 16-17]) – All three approaches were used to accomplish the tasks.

In order to achieve my research goals and to carry out the tasks formulated by me, I chose methods from both large groups of qualitative research – “interventional and non-interventional” – (Iván Falus et al., 2004 [2, p. 12]). These were the following:

- Wide range of professional literature research, analysis of sources to support my conclusions and recommendations. Synthesis of my new knowledge using my experience. – The document analysis method from the exploratory research methods.
- In semi-structured interviewing³ preparing a “snapshot” in a sample research among teachers in the Hungarian higher education institutions and the DGC’s students in informatics engineering to do the tasks written for research goals 2–5. – The observation and the oral interviewing from the exploratory research methods.
- Creating categories for systematic integration of e-learning strategies, comprising the full range of strategies. – Document analysis method from the exploratory research methods; the statistical and the meta-level analyzes from the processing research methods.
- Keyword and content analysis of the Institutional Development Plans of the Hungarian higher education institutions in the summer of 2018. – The document analysis method from the exploratory research methods.

² Conceptualization: The process of “defining exactly what we mean by each term”. As a result of the process, we define one or more indicators of what we have imagined” [11, p. 141].

³ Semi-structured interview: I prepared pre-formatted interview pages with generally open questions. The interviewees' answers were always given according to their own thoughts and they almost always justified them.

- An overview of the curriculum provider forms of higher education institutions in Hungary with internet search, summary of my observations. – The document analysis method from the exploratory research methods; quality analysis from processing methods.
- To organize the e-learning models I consider the heuristic clustering appropriate. With the help of it to train the model classes and to demonstrate the classes with model examples. – The processing and the statistical methods from the exploratory methods.

I consider it important to highlight the following in order to documentation of my professional literature research. My research topic has abundant supply in professional literature, although e-teaching-learning – e-learning – as a process or system is examined in relatively few publications. The applied model and strategy concepts are very heterogeneous and difficult to compare. Therefore, first and foremost, I sought to clarify the concepts I consider to be correct with comparative analysis, and I tried to set up suitable aspects and methods for reviewing and comparing many of e-learning models and e-learning strategies. When I expanded on the topic, I contrasted the models and strategies described by the authors, and I selected variant examples, or formulated models that could be created by synthesizing what I found.

In addition to the professional literature on e-learning models and strategies, I also worked up resources that have broadened the scope of modeling and strategy development. Have been a great help in formulating my new models the works of authors, such as Ludwig von Bertalanffy [3], Stephen Hawking and Leonard Mlodinow [4] [5] and Imre Seebauer [6], furthermore deal with modeling military systems György Seres [7] [8], János Kóthay et al. [9] and András Mező who dealing with concepts of art of warfare [10].

Some other publications, which proved to be extremely useful for me: from the literature of the research methodology by the writings of Earl Babbie [11] and Júlia Hornyacsek [12], and the literature of talent management by Gabriella Bognár, Éva Gyarmathy, László Tóth and László Z. Karvalics.

STRUCTURE OF THE DISSERTATION

The doctoral dissertation consists of four chapters.

Chapter 1 documents the fulfillment of my research goal 1. Here I look at e-learning and attitudes towards it. First I give an overview about the possibilities of modeling the teaching-learning process in order to justify that the various e-learning models based on the observations of the modeling man are real and useful. Then I give a literature review of atypical forms of education on the side of education technology, with an emphasis on the characteristics of adult education and the benefits of considering global e-learning trends.

The next part of the first chapter is important to point out the difference between the concepts of e-teaching-learning strategy and the e-learning strategy to be discussed in Chapter 3, and to prove that the educational institutions and the teachers working in them are able to place great emphasis on the teaching of the teaching and the learning.

Chapter 2 documents the fulfillment of my research goal 2. Here I present my two new theoretical models for the operation of the e-learning: the HW–SW–HR (hardware–software–human resource) and the conflict-reducing e-learning model, which emphasize the role of the human factor using and developing the e-learning. The conflict-reducing e-learning model **justifies my hypothesis 1**. Then I present the results of my semi-structured interviews on the e-learning attitude which was prepared with 25 teachers of 16 Hungarian higher education institutions and 25 DGC students in informatics engineering in the summer of 2018 as a snapshot – with these, my conclusions are confirmed.

Chapter 3 documents the fulfillment of my research goal 3. First I deal with the systematization of the e-learning strategies, for which I create two models: the levels of e-learning strategy development with pyramid model and the system model of the hierarchical, networked by level e-learning strategies. Then I present models typing the e-learning strategies found in my literary researches, and my own typing, named the introduction of e-learning with evolutionary-revolutionary-incremental adaptation. Types of typologies can be used in different ways in higher education institutions. Then, based on my literary research, I offer different types of criteria-based models for creating e-learning strategies. **I support my hypothesis 2** with the above.

Then I present the results of my analysis of e-learning with the current Institutional Development Plans of the Hungarian higher education institutions. The chapter ends with the analysis results of the answers to the question block on the institutional e-learning strategy of semi-structured teacher / student interviews.

Chapter 4 documents the fulfillment of my research goal 4 and 5. For the unified, expanding system of the e-learning models I have developed, I first define the clustering solutions of the e-learning models so far, and I justify the need for a systematic overview of the models of the constantly developing e-learning form. Then I present the concept of the unified expanding system of the e-learning models, the initial main and sub-model classes with example models, and my portal showing model classes and example models to **prove my hypothesis 3.**

My practical e-learning model that supports the development of motivated college students in informatics engineer belongs to the talent management e-learning model class. In connection with this, first I give an overview of talent management models, then I present the Dennis Gabor Talent Point, where comes to life the generator, creative, innovative work model (in Hungarian Alkotó, Kreatív, Innovatív Munka [AKIM] modell), then the basic concept of the model and the model itself. Finally, I summarize the results achieved with the model in order to prove its effectiveness and efficiency, together with these **prove my hypothesis 4.** The model also serves as **an example for my hypothesis 1.**

The evaluation of the relevant questions of the interviews related to the topics of the chapter has been included in one subchapter, which explains the usefulness of the taxonomy's publishing, and I present the opinion of the interviewed students about DGC's e-learning and the AKIM model.

Supporting writings and tables related to my research can be found in the chapters of the annex.

SUMMARIZED CONCLUSIONS

Learning as a psychic activity is constantly expanding with elements, because learning tools (learning environment, its material and personal components, conditions), the pedagogical possibilities offered by the tools, the new cooperation and communication relations are constantly enriched. Therefore, in my dissertation I examined the possibilities of modeling the teaching-learning process and I justified that the varied e-learning models based on the observations of the modeling man are real and useful.

I studied atypical forms of education from the side of educational technology, with emphasis on the characteristics of adult education. With my research, I drew attention to the global e-learning trends, which give an insight into the trends of electronically supported learning and teaching, considering those is useful for developing your e-learning models.

It is necessary to create meaningful phrases because under the umbrella of e-learning, more and more concepts are emerging in the emergence of diverse forms and focal points of e-learning.

The deliberate “mixing” of media types with today’s technology and technological capabilities is limited by the lack of resources to support teachers, for example, with educational technology / curriculum development groups, unlimited mobile Internet access, with own computer.

I emphasized that regardless of paradigm shift, it is true that the learning strategies are based on learning techniques chosen according to the learner’s learning style(s), and that the learner is influenced by external and internal factors, too. I emphasized that teaching strategies are open systems; their application depends on the purpose and content of teaching, the teaching-learning environment and the teacher’s methodological skills, techniques and practice. Furthermore the teaching strategy can be approached by teaching goals, methods and from the learning organization, too. With the help of the exemplary models and the results of the interviews conducted in the framework of my research, I have confirmed that e-teaching-learning models are based on the andragogy, the transformative learning⁴ and the media synchronicity theory⁵.

I pointed out the differences between the concepts of e-teaching-learning strategy and the e-learning strategy, and I also proved that educational institutions and teachers working in them can place great emphasis on the teaching of the teaching and the learning. I have identified that the teaching and the learning strategy is interpreted at the level of participants in the learning process, i.e. the learning is a dynamic, conscious problem-solving activity of the learner; while the teaching strategy deals with the organization of the teaching in a didactic approach. Looking at the e-learning strategy – its traditional name educational strategy – we reach the level of the teaching-learning activities through the higher social strategies and the institutional strategies. Examining the strategy in the hierarchical order of the operations and the actions, the level of the teaching-learning activities is located underfoot.

I have created two theory-oriented models examining the functioning of the e-learning, in which I emphasized the role of the human factor using and developing the e-learning. With the HW–SW–HR (hardware–software–human resource) e-learning model, I proved that we get a more sophisticated picture of the e-learning periodization, opportunities and constraints examination when along with following the changes in the hardware, we follow the changes in the software in parallel and interpret the software broadly, and in addition, the focus of the human resources is included in the examination. In this model, the hardware includes electronic devices used in teaching and learning; the software includes hardware-based programs, frameworks, web search,

⁴ Transformative learning theory: It aims to lead adult learners to new perspectives by interpreting new information. It deals with their needs from this perspective. It converts and transforms their initial state.

⁵ Media synchronicity theory: It searches for the most appropriate media for transmission in the communication of new information and knowledge.

applications, tutorials, curriculums; and the human resources are the human resources of the teaching and the learning, including all staff in the educational institution, as well as the manware⁶ and the orgware⁷. In relation to my HW–SW–HR e-learning model, I have proven that the most important the human resource in the e-learning and its evolution. The generator, creative, innovative human resource utilizes the opportunities of the hardware and the software.

My other model emphasizing the role of the human factor is a conflict-reducing theoretical e-learning model also using an armed struggle model. With this model I proved that using e-tools in the teaching-learning process as a cybernetic system, conflicts arising in the education can not only be reduced but prevented, even the efficiency of the system can be increased and optimized, too. So I **proved my hypothesis 1**.

By completing the tasks I defined and providing the logic that I consider appropriate, I created model categories in the field of expanding and diverse world of the e-learning strategies: models reviewing the levels of e-learning strategies; models typing e-learning strategies; e-learning strategic models. Based on my hierarchical models that review the evolving of the e-learning strategies, I found that they can make it easier to review the levels of the strategy development. In addition, based on my research, I found that the relevant strategic documents and legislation in the education should support the ability to get back the retroactions to the top strategic level from the bottom-up network. In my hierarchical, networked system model, the e-learning system can be interpreted as a support system covering the educational system, including the structure and the teaching network of the institution. My model of e-learning strategy typing “revolutionary, evolutionary and incremental e-learning implementation strategy” model was designed to point out what are the major solutions for the organization to migrate it to become an e-learning user. I consider my **hypothesis 2 to be proven**.

The relevance of my theoretical e-learning models emphasizing the role of the human factor was confirmed by the results of the semi-structured interviews evaluating the responses to the e-learning attitude.

With the analysis of the Institutional Development Plans – as strategy document – published by the higher education institutions on the Internet in the middle of the summer of 2018 – mostly prepared for the period 2016–2020 –, I concluded that these institutions are trying to integrate e-learning into their strategy. I examined the teachers’ / students’ views on the strategy of their institution during the semi-structured interviews with questions closely related to the model of

⁶ Manware: man+ware. Man’s knowledge and procedures used to solve problems or make decisions.

⁷ Orgware: organization+hardware. Organizational structure, which operates the software and the hardware.

critical components of e-learning by Marc J. Rosenberg (2001) [13]. Here I only highlight one of the results of the evaluation: according to most teachers, their institutions had no e-learning strategy, and less than 1/3 of the students stated that DGC had e-learning strategy obviously.

I have explored the e-learning model classifications so far prepared by literature research. I have determined why it is necessary to place e-learning models in a comprehensive system in higher education. By performing the tasks I have defined, and by the method I consider appropriate, the so-called hierarchical clustering I demonstrate, that in the expanding and diverse world of e-learning models, it is possible to set up an appropriate system for the full range of models and I have developed the unified, expanding system of the e-learning models. I consider my **hypothesis 3 to be proven**.

In connection with the questions of semi-structured teachers' interviews, I proved that the <https://elearning-modellek.hu/> portal I had created for publishing the taxonomy there have been also a reason for it, because the higher education teachers interviewed in the sample survey knew little model classes and they did not all have them its own e-learning model. By evaluating the semi-structured student interviews, I found that students were generally satisfied with DGC's e-learning model and services; their constructive critical opinions had on each subject.

I created the practical AKIM (generator, creative, innovative work) e-learning model for talent management, which also uses project work opportunities. I have proved the effectiveness of the AKIM model in the practical application in Dennis Gabor Talent Point. So **I proved my hypothesis 4**. The model can also be used to support the development of students in undergraduate education in military and civil education, as well as training of workers in public and municipal institutions to support their development. **I confirmed my hypothesis 1** with the AKIM model, too. Based on responses to the question of semi-structured students' interviews, students were satisfied with the AKIM model.

I have created an Internet portal to provide a comprehensive introduction to the unified, expanding system of the e-learning models and to support the classification and the collection of model examples. The portal also contains the system of the e-learning strategies I have created with the example models and the e-teaching-learning strategies presented in my dissertation, as well as the systematization of e-learning quality assurance.

NEW SCIENTIFIC RESULTS

1. By analogy with the cybernetic model of armed struggle, I developed a system model for conflict-reducing e-learning in the teaching-learning process.
2. Based on the analysis of the professional literature I developed my classification system called “unified, expanding system of e-learning models”.
3. I created the e-learning type of talent management model AKIM (generator, creative, innovative work) for the students of the higher education.

THE APPLICATION POTENTIALS OF THE RESEARCH FINDINGS

- My new theory-oriented models which emphasize the role of the human factor that uses and develops e-learning, can inspire the institutions and the teachers to examine the teaching-learning process as a cyber-system and reduce, prevent the conflicts in the education, even increase, and optimize the system efficiency by integrating e-tools.
- My hierarchical models of e-learning strategy creation and my e-learning strategy models’ systematization with the given example models can be used to prepare e-learning strategies of the higher education institutions.
- The summary evaluation of semi-structured teacher / student interviews drew attention to several anomalies and problems. (E.g. only activities and services closely related to the transfer of the professional knowledge are learning supporters by a large proportion of the interviewees. The news about the institutional strategy, the e-learning strategy and the changes in the life and the processes of the institution is largely not “achieved” by the two main characters of education, the teachers and the students). I consider it useful to change the attitude and the practice of the educational institutions considering these.
- The <https://elearning-modellek.hu/> interactive web portal – which deals with the use of the e-learning models in the e-learning, the e-learning strategies, the e-teaching-learning strategies and the e-learning quality management – for those who are interested in them is searchable and continuously expandable and supports the online professional exchange.

- The Institutional Development Plan of the National University of Public Service (NUPS) includes the launch of public service teacher training⁸. It is also advisable to integrate e-learning into the training in order to be included as a model in the teachers' toolbox and methodology. Also, it is recommended that the teacher students, the teaching staffs and the leadership of the institution become familiar about the e-learning strategies and models in a comprehensive way. In the case of the teaching staff of the NUPS, it is recommended to develop e-learning methodological trainings and to support the e-learning work of the teaching faculties with methodological groups.
- According to the student interviews of the sample research, the learning repertoire of the higher education students is generally not rich enough; therefore it would be necessary to introduce not only at the beginning of the training, but also at the beginning of each academic year, broken down by grade / work form, obligatory, zero-credit learning methodology subject.
- The AKIM model can be used in higher education institutions, including military and civil higher education students, as well as in the training of public and municipal bodies to support their development.

RECOMMENDATIONS

Opportunities for Teaching-Learning Environment and Modeling

- Study of the temporal changes in the personal teaching-learning environment and the e-learning attitude in the higher education with longitudinal research. For this to take sample from the populations of the two main characters (teacher and student) by year-by-year snapshots. (E.g. at national, at cross-border higher education institutions with Hungarian language and at the cooperating international partner universities indicated in the Institutional Development Plan of the NUPS). Using the questions of my semi-structured interviews and the data from responses created for online questionnaires. After evaluating the results, formulate suggestions for the use of the widely available e-learning tools and the related methods to develop the teaching-learning practices. Dissemination⁹ of summary conclusions directly to the participants in the survey.

Opportunities for Teaching-Learning Strategies

⁸ Institutional Development Plan of NUPS 3 *Highlights of Training Development Chapter g*. Public service teacher training and pedagogy, http://archiv.uni-nke.hu/uploads/media_items/intezmenyfejlesztesi-terv-2015-2020.original.pdf, visited on July 31, 2018.

⁹ Dissemination: Transfer the experience of product, service, or project implementation to maximize the impact they generate and the utilization of the costs.

- Elaboration of compulsory subjects with Student Competence Development Training, Skills and Personality Development or other subjects name for beginning of the academic years for each grade within each work form. The goal of these subjects is to enrich students' learning styles, techniques and strategies in the changing higher education environment using also collaborative methods. These subjects are like compulsory zero credit credits subjects, which have already been a tradition in the universities and the colleges. These subjects are used to control the necessary skills and fill in the gaps in the fields of science essential to the training. Develop method and tools to measure progress in the targeted skills.
- Identifying how and why the teachers and the students initiate communication with each other. Making suggestions for the supporting of the learning and the talent development by improving the communication.

Opportunities for Institutional E-learning Strategies

- Collection and placement of additional e-learning strategy examples in the classification system.
- Half-structured interviews diagnose the application of the e-learning and the e-learning strategies in the higher education institutions in Hungary every three years. Disseminating the summary conclusions directly to the interviewees, too.

Opportunities for Unified, Expanding System of E-learning Models

- Publication of additional model models on the <https://elearning-modellek.hu/> portal and, if necessary, training of new classes.
- Provide additional (secondary) classes and keywords for the model searching.
- Research the current use, models, best practices and opportunities of the e-learning through semi-structured interviews.
- Elaborate suggestions and disseminate good practices to teaching-learning process models that fit each e-learning strategy.
- Explore the usability of the unified, expanding system of the e-learning models in artificial intelligence (AI) model systems.

Opportunities for the E-learning Model Supporting the Development of Motivated Students

- Conduct semi-structured interviews then a questionnaire on what the teachers, the students and other actors in higher education what are considered as talent management.

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PUBLICATION LIST OF THE CANDIDATE RELEVANT TO THE DISSERTATION'S TOPIC

Peer-reviewed professional journal articles

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SCIENTIFIC-PROFESSIONAL BIOGRAPHY OF THE CANDIDATE

Name: Antónia Berecz

- PhD student: National University of Public Service Military Technical Doctoral School, research field: Faculty of Defence Electronics, Informatics and Communication, 2012-.

Education:

- Engineer-informatics, application development specialization: University of Miskolc Faculty of Mechanical Engineering, 2005.
- Public education specialist: School of Arts and Crafts, 2001.
- IT engineer, technical manager specialization: Dennis Gabor College, 2000.

Further training:

- Talent management.
- E-learning.
- Training for trainers in info-communications field.

Educational activity:

- Dennis Gabor College: adjunct, 2001-.
- Dunaújváros College: department engineer, 2007–2011.
- SZÁMALK vocational secondary schools: teacher, 2016/17., 2015/16., 2010/11.
- Master Training Workshops Developer, Service & Professional Training Ltd.: IT practice tutor 2016/17.

E-learning activity:

- Introducing and managing LMS, system administration.
- Dennis Gabor College, 2001-.
- Dunaújváros College Information Technology Institute, 2007–2011.

Talent management:

- Dennis Gabor Talent Point: workshop leader 2010-, director of talent point 2015-.

Honors:

- Doctoral Researcher Scholarship: UNKP-17-3, New National Excellence Program, Ministry of Human Resources, 2017/18.
- Multimedia in Education Ring – Curriculum Award: NJSZT MMO Section, 2017.
- Diploma for several years of successful work for the Hungarian ILIAS Community Public Benefit Association (MIKE), 2015.
- TESZ Award: For service of college talent management, DGC, 2014.
- Commemorative Medal: LSI Informatics Training Center, 2004.
- Excellent Worker's Diploma: LSI Informatics Training Center, 2002.
- Commemorative Medal: LSI Informatics Training Center, 2001.

Membership:

- John von Neumann Computer Society (NJSZT) member, 2007–: Fuzzy Section member; Multimedia in Education (MMO) Section professional advisory board member.
- Hungarian ILIAS Community Public Benefit Association (MIKE) founding member, secretary, 2010-.
- Association of Hungarian PhD and DLA Candidates (DOSZ) Department of Military Science, founding member, 2013-.

Foreign languages:

- English: intermediate level (C), Foreign Language Training Center.
- Esperanto: intermediate level (C), ELTE Foreign Language Training Center Ltd.

Publication activity:

- [The Hungarian Scientific Bibliography.](#)