The impact of digital transformation on the continuing training of Hungarian teachers – Peculiarities of distance education -

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Abstract

One of the specific areas of the global digital transformation in education is the continuing professional training of teachers. In this formal adult training that has taken place alongside work in the last 30 years, the impact of digital transformation can be considered a process suitable for general conclusions. About 25,000 students have graduated from the teacher leadership training program of the Budapest University of Technology and Economics (BME) in the past three decades. This paper presents the content and organizational development process of this training program from the point of view of digitization transformation .The analysis of the theoretical and practical connections of the process analyzes the new kind of adult education characteristics of the function realized between 1993-2023 in parallel with the Digital Transformation. One aspect was based on a comparative study with international trends analysis), which resulted in the developing a new distance education model. From a methodological point of view, our innovation being described was essentially action research. Network structures were significantly created: teachers working in small and development groups comprising senior consultants."Distance education," which initially used classic correspondence solutions, was significantly transformed after the turn of the millennium precisely due to Digital Transformation. Learning Management Systems (LMS) and online solutions that make network communication continuous were developed between 2006-2018. This form of training proves with data that ways and opportunities can be created for quality training alongside work within the lifelong learning framework. The continuously detectable high level of student satisfaction indicates that, in addition to the many tensions of our current way of life and the confinement caused by the pandemic between 2020 and 2022 in the last few years, the prominence of online communication solutions can give a realistic chance of realizing the adult education goals by networking.

Keywords: Adult Education, Countiuning Training, Digital Transition, Networking

1.Introduction

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The digital transformation (Beetham & Harp, 2019; Bell, 2011) is an innovative process suitable for general conclusions in the formal adult training networking that has been taking place alongside this work for the past 30 years. In terms of modeling the effects of digital transformation, we selected a subsystem of the teacher training system that is characteristic of the process. This population is 1.5-2 percent of the total employed teaching staff annually. At the same time, in the case of the rich selection of training programs, it is the program employing the most significant number of students in which the digital transformation process can be illustrated relatively well.

The theoretical and methodological frameworks of the research were shaped by the new educational theoretical insights linked to digital transformation and the innovative efforts of connectivist teaching and learning. According to the researchers, the primary purpose of collaborative teaching is to activate the students with the tasks. This trend has to open been increasing over the last decade, and the primary reasons are the use of communication technologies and collaborative tasks. Our research also pointed out that the depth and dynamics of teacher attitude change are significantly related to cultural factors, among which the preparation of teachers and the development of their competence related to collaborative methodological procedures in the online environment play a decisive role. In this way, we can not only examine the knowledge transfer related to collaborative learning in practice, but we can also intervene in a preventive way in the quality improvement of teacher support in the vocational training system. Today's modern e-learning teaching materials OER (Open Education Resources) are also looking for the answer to the fundamental question of how we can make the content of education open and the subject matter be mastered and convey them in structures that are also open to the students.

The author's methodological approach was based on the history of the training, which was characterized by synchronous presence within the framework of the university during the entire period. This gave us a way to interpret the specific topic – digital transformation – as action research, with particular attention to the stories of the pandemic period. A formal analytical and evaluation research carried out in entrepreneurial university frameworks provided the opportunity to analyze and characterize the three-decade history of the training (Benedek, 2023).

The paper, in four subsections, presents the content and organizational development process of this training program from the point of view of digitization transformation. Firstly, briefly refer to the antecedents since the past three decades are a significant period from the point of view of digital transformation. However, the traditions of management training are significantly older than this. The nature and impact of the digital transformation on specialized continuing education is precisely the new form and content of the training, which we set out to systematize during the research. Our research question, which was raised from the point of view of the analysis of the three-decade process, was how they can be described,

what are the model elements of this process, and how they affect teacher training, mainly specialized further training. By presenting the antecedents, our analysis graphically illustrates the complex system of the formation of the model, the phases of its development, and the results of the research is summarized in the Conclusions section.

2. About the antecedents

Hungary's continuing education system for teachers was also created due to a nearly century-long development process.[8] The accreditation documentation has been submitted for the Head of Public Education operation as a specialized continuing education course in distance learning. The BME received the accreditation license for this. The professional qualification for the head of the institution and, at the same time, the teacher's professional examination requirement was formulated at the legislative level in 1997[9]. It was then that the purpose of the training was defined[10]: For the current and future leaders of the public education system (professionals working in leadership roles of educational institutions and in various fields and levels of educational management), such modern, theoretically grounded, and at the same time practice-oriented management and organizational theory, management psychology, education systems, -planning, -management, -economic, legal knowledge, and the development of managerial skills, which provides preparation for the professional performance of school principals and other public education managers, as well as expert tasks related to educational management.

Different forms of management training have developed in different sectors of the Hungarian public sector. In the case of the education sector, the knowledge required for management can typically be acquired not as part of primary education but as part of further education in a higher education institution. About 25,000 students have graduated from the BME teacher leadership training program, which is committed to digital transformation, in the last three decades. This form of training was established in the field of education in 1993. From 2002, the completion of further training was given priority among those applying for

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[8] LXXIX of 1993 law on public education - 1993. évi LXXIX. törvény a közoktatásról
   URL: https://njt.hu/jogszabaly/1993-79-00-00.72 (23.11.23)

[9] 8/1997. (II.18.) MKM decree - 8/1997. (II.18.) MKM rendelet
   URL: https://jogkodex.hu/jsz/1997_8_mkm_rendelet_9379467 (23.11.23)

[10] Annex to 8/1997. (II.18.) to MKM decree: Qualification requirements of the specialized continuing education
   program for the head of public education
   URL: https://jogiportal.hu/index.php?id=1vhkb6na19xzvnkiw&state=20061003&menu=view (23.11.23)

the position of director of the educational institution, then from 2005, it was a condition for re-appointment. In 2013, it was also a condition for the first management assignment.

Theoretical initiatives worldwide have turned into significant experiments in the last two decades, so it is essential to highlight the practical aspects. Such can be considered the striking appearance of the representatives of the connectivist learning theory, initially strengthening the openness of higher education (Siemens, 2005), MOOC (Massive Open Online Courses) expansion in the leading higher education institutions. All this meant an exciting orientation. From the point of view of our research, it was essential to realize that it is advisable to ensure flexibility in the organization of learning activities. Looking back to the spring of 2020, to the crisis management, as a result of the consistent developments of the previous period, a well-functioning, stable educational framework was already available to the institution during the digital transition. Instructions, information, and feedback can be sent quickly and purposefully in a group e-mail. Subject messages can be easily handled in framework systems (such as Moodle). The "distribution," archiving, and documentation of teaching materials available to everyone, tasks developed by individuals, and student work can be solved much more efficiently than traditional forms and can usually be directly linked to statistical analyses, complex group and individual evaluations.

At the level of history, in terms of its content, training structure, and applied methods, it is justified to highlight three factors of the creation of modern specialized teacher training, which presumably laid the foundation for the success of the next three decades. First of all, it is justified to point out that the importance of leadership training was recognized in the innovation process of the institutional development and management system. The other and the institutional aspects of the thirty-year history also confirm this, that the historical commitment of the given university to the development of the education system meant an organizational background and a personal decision-making situation, especially in the first decade of the system change, which led to professional initiatives, the new model of domestic public education leadership training it also provided policy support for its development.

3. The nature of digital transformation and its impact on the training

In Hungary, the continuing education system for teachers was also created due to a nearly century-long development process. This system has sectorial solid management functions regarding its goals, operation, and legal regulation; the regulation and recognition framework is usually linked to a ministry. In the past 50 years, this has specifically meant regulatory regulation, which is coordinated at the level of implementation by school administrators (currently school districts) and local governments (in the case of kindergartens).

Within the framework of the present analysis, within the further education system of the teacher, we organize the peculiarities of the further education system of the institution managers that took place in the last three decades. By definition, the teacher training system is linked to the higher education institutions in which the teachers obtained their diplomas. This system was characterized by centralization even before the system changed. At the same time, in the last decades, adult training companies have appeared, which primarily offer various programs to teacher training participants within the adult education framework. It is a significant feature, and this applies in the same way as international trends, that most institution managers come from ambitious teachers who show an interest in organizational leadership. Professional continuing education programs are vital in this professional mobilization and developing further career paths. Figure 1 shows the system elements, highlighting the primary connections characteristic of the teacher continuing education system that has developed in recent decades and is still operating.
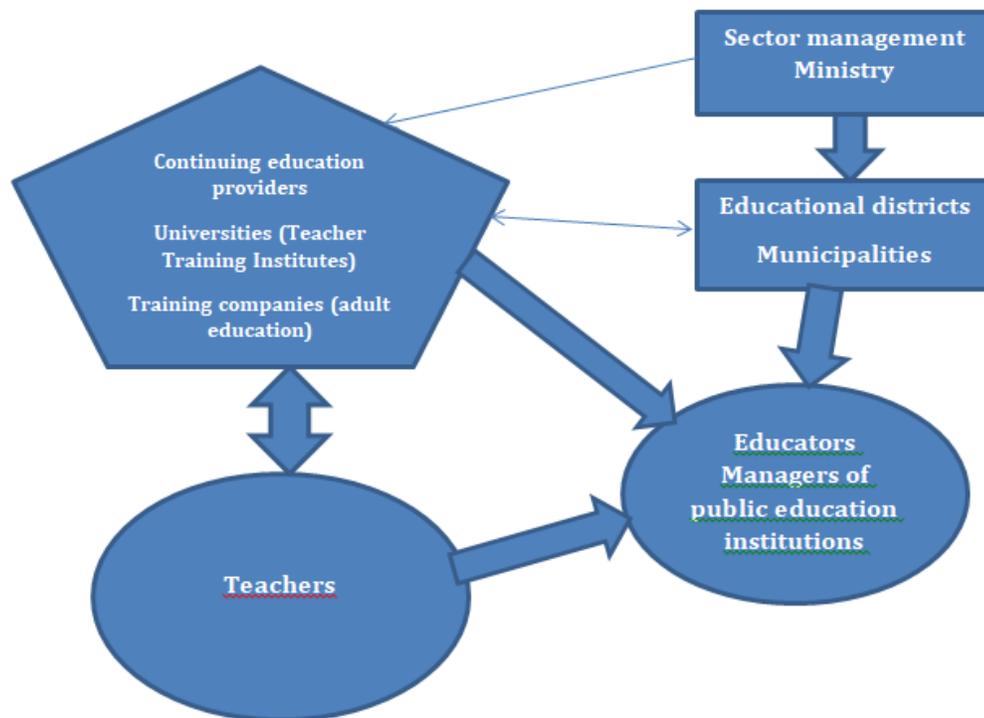

Figure 1. System elements of continuing training of teachers in Hungary.

In education, especially in institutional frameworks, such as classically in schools, the roles (instructor-student) and the actors (teachers and students) are relatively well defined. Based on their age and their already acquired and recognized qualifications (teachers), teachers were also formally positioned in the organization created historically to create the

conditions for teaching and learning. The traditional elements of the education system - schools that educate and educate young people - were already established in ancient times and have slowly developed over the past centuries while respecting traditions.

Educational institutions perform many tasks related to preserving, transmitting, and renewing knowledge. In addition to preserving knowledge and archiving its valuable elements, it is essential to participate in the renewal of knowledge, which is possible and has good traditions if education is closely connected to knowledge development and research. The mission of higher education is critical in this respect (Schratz, 2009). However, at the same time, the quality of teaching and learning is also essential in the beginning and middle stages of education. In this respect, in addition to the classical actors – instructor and student – in the initial stages of schooling, when the role of informal learning is taken over by formal education, the supportive direct and indirect presence of parents is significant. Especially during the period of obtaining the funds, the actors thus form three poles, in which contexts their role and weight vary over time and based on specific situations.

The changes of the last decades in the digital transformation process perfectly demonstrate that the world of learning has also changed in the case of teacher training. In the case of this training, the distance learning solutions can significantly facilitate the learning-consultation process due to the peculiarities of their leading work, their considerable busyness, and the national nature of the training. The university background and the adaptation of the technological environment to training functions also created a unique opportunity in this respect, which resulted in the formation of a "humanistic distance education."

It was perceptible that after the adoption of the education laws legitimizing the actual system change, programs supporting the development of teacher competencies in an increasingly complex manner appeared in the school world, and continuous further training became not only an expectation but a real possibility for teachers. In the past three decades, the most significant number of distance education students in Hungary - about 2,500 students on average per academic year - was associated with the professional further education of teachers at the BME. As a result of continuous developments, since 2010, distance education supported by ICT tools has operated exclusively in a modern educational framework with innovative educational forms and methods. The essential feature of our humanized distance education was the use of modern electronic educational frameworks and the direct personal, professional relationship established with the consultants, which was supplemented with contact training and exercises in a manner recognized by student feedback and external references in order to reduce the risks of distance education becoming impersonal. This blended learning form of education was developed over many years, and its acceptance is characterized by the fact that approximately 80 percent of those who

graduated from public education leadership training chose this form of education and our institution in the last decade as well.

In mid-March 2020, the Technical Pedagogy Department of BME was among the first to decide on the immediate transition to online education. In the training, students were introduced to the framework (MOODLE) that has been used for more than a decade, and distance digital education was fully introduced. The preparation of the decision was not without controversy; there were reservations, partiality, and several counterarguments formulated to defend already proven solutions. After the decision, the sessions, the training, and the training programs in the exercises took place exclusively online. Undoubtedly, there were minor, temporary technical difficulties. However, in about two weeks, the system was established that effectively supported the training and individual learning of the students until the end of the academic year. In the meantime, we paid close attention to the world and the domestic environment and built on our previous experience.

Suppose we want to systematize the elements of the model that can be seen in specialized further training, which is particularly characteristic of management training. In that case, the diagram links the following main characteristics. For the successful completion of management tasks and the associated official recognition and social position, it is essential that a high-level quality management system operates in higher education (universities) linked to state recognition and remuneration references. From the point of view of our analysis, four functions of the distinguished development model can be highlighted in this relational system, which is as follows:

• Flexible driving services for training participants

• The organization of the distance education area, in which the innovative application of coaching methods takes place

• The creation and adaptation of particular learning frameworks depend on the training goals

• Integration of professional content development and financial organization processes

These functions also raise sensitive questions in higher education, which is operated in a more rigid organizational framework based on traditional time. Because of their complex nature, at the same time, they can be closely related to management activity and its modern forms. In the case of successful solutions, they offer specialized further training programs attractive to managers.
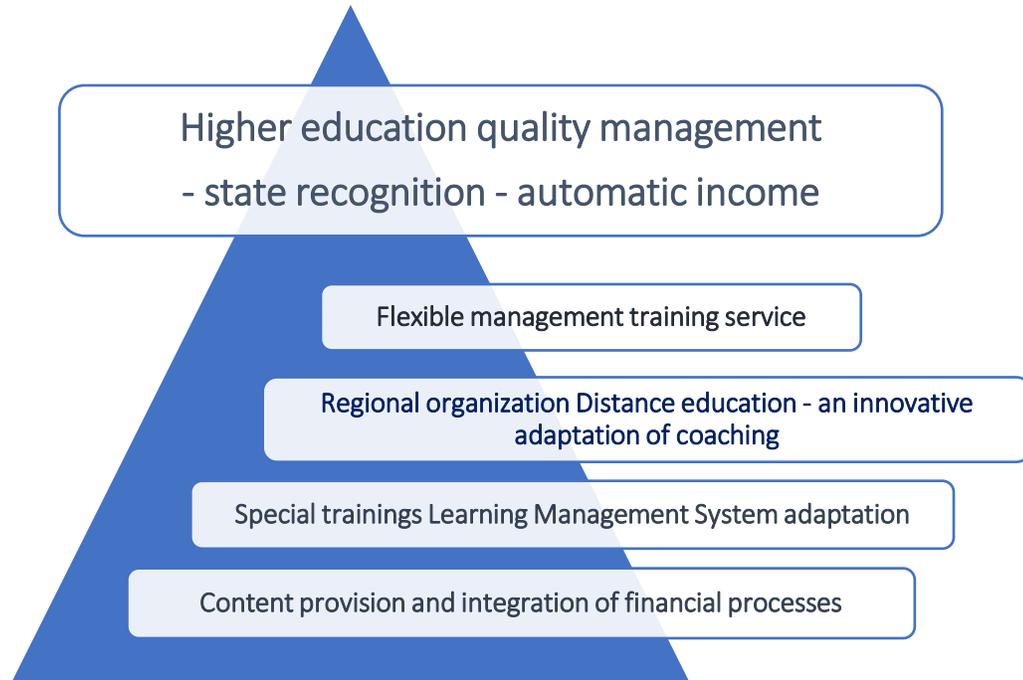
Figure 2. The essential features of the development model.

The participiants play a crucial role in our training model, a potential or currently practicing manager who defines innovative methodological construction tasks when organizing his activities. These constructions are suitable for active interpersonal interactive communication. However, at the same time, individuals and groups aim to create new content constructions (these can be published and professionally analyzed as micro-contents in the most direct way). In principle, the starting point is the learning result. However, the environment that reflects the needs of the labor market in connection with the training is essential. Professional practice prevails in this environment, and in the case of dual education, the company culture, professional (project) tasks, career opportunities, and technological capabilities are essential. All this occurs in a continuously developing online environment, where the above factors act complexly; the applied solutions enable the students to provide feedback, formulate, and send their questions.[1]

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[1] The experiences of student feedback are detailed in a study published in a volume summarizing three decades of training experience: Benedek, A. (2023) Szakirányú pedagógus-továbbképzés a Budapesti Műszaki és Gazdaságtudományi Egyetemen 1993-2023, három évtized: új képzési forma, koncepciók és eredmények (Professional teacher training at the Budapest University of Technology and Economics 1993-2023, three decades: new training form, concepts and results) (Benedek, 2023; 6-52.)

It is also a communication option provided by the framework system, which allows for a virtual reception hour if needed, ensuring communication availability within a given time slot (max. 2 hours) by phone, Skype, or other mutually available chat channel. Undoubtedly, we could rely on other precedents as well, such as the fact that several electronic materials were prepared within the framework of our projects implemented at the BME a few years ago, which meet the modern e-learning requirements: content descriptions were sufficiently segmented, and video recordings were also connected to the materials. , their control questions also enabled interactive testing.

As we have already mentioned, the original feature of this course was that as a "humanized distance education," it opened up a new world for students who learned the "art" of management in addition to work, which expanded the more resolved arenas of consultations, promoting "horizontal learning," and the educational packages, then, thanks to electronic learning support systems, he made the curriculum available and learnable in a different way than usual.

This innovation is undoubtedly one of the main reasons for the success so far. In the case of this form of distance education (Kovács, 2014), content-centeredness dominates, which is suitable for mass education which is supported by a framework supplemented by direct control and activity-centeredness implemented in exercises and training and continuously supported by consulting work. Although only three years have passed since the analysis, which also included constructive suggestions, was made known, many elements of the story have changed significantly. We can talk about the framework systems in the plural since Moodle, which supports education, and the Neptun (learning administration) systems, which organize study questions, including tasks related to financing, are available to students together and in an integrated manner. In addition to the positive fact of this, it should be mentioned that the majority of the students had not encountered such systems when obtaining their previous diploma, and knowledge of the management and use of systems that exclusively deal with academic, educational administration, and the management of academic tasks is essential when organizing courses. A new risk factor has also appeared, the importance of which cannot be neglected shortly: system shutdowns and malfunctions can have a severe impact on professional prestige. Therefore, the issue of functionality and data protection security has become essential. Despite all these risks, it can be stated that there is no alternative to expanding distance education/online type services in the case of further specialized training. Up-to-date content in a flexible form, with increased consideration of the students' living and working conditions, can only be solved by effectively operating these solutions.

Phase 1 (1993-2000)

Development of new electronic forms of content development

Phase 2 (2000-2005)

Development of the framework and methodology for communication between teachers and students(Procedure system - differentiation according to groups)

Phase 3 (2006-2014)

Introduction of an open source LMS system and its use in content provision and interpersonal communication

Phase 4 (2015-2019)

Integrated IT development of the entire training and financial system

Phase 5 (2020-2023)

Rapid switch to online operation, then slow, contradictory "return" (MS Teams implementation, hybrid solutions) - search for new stability (?)
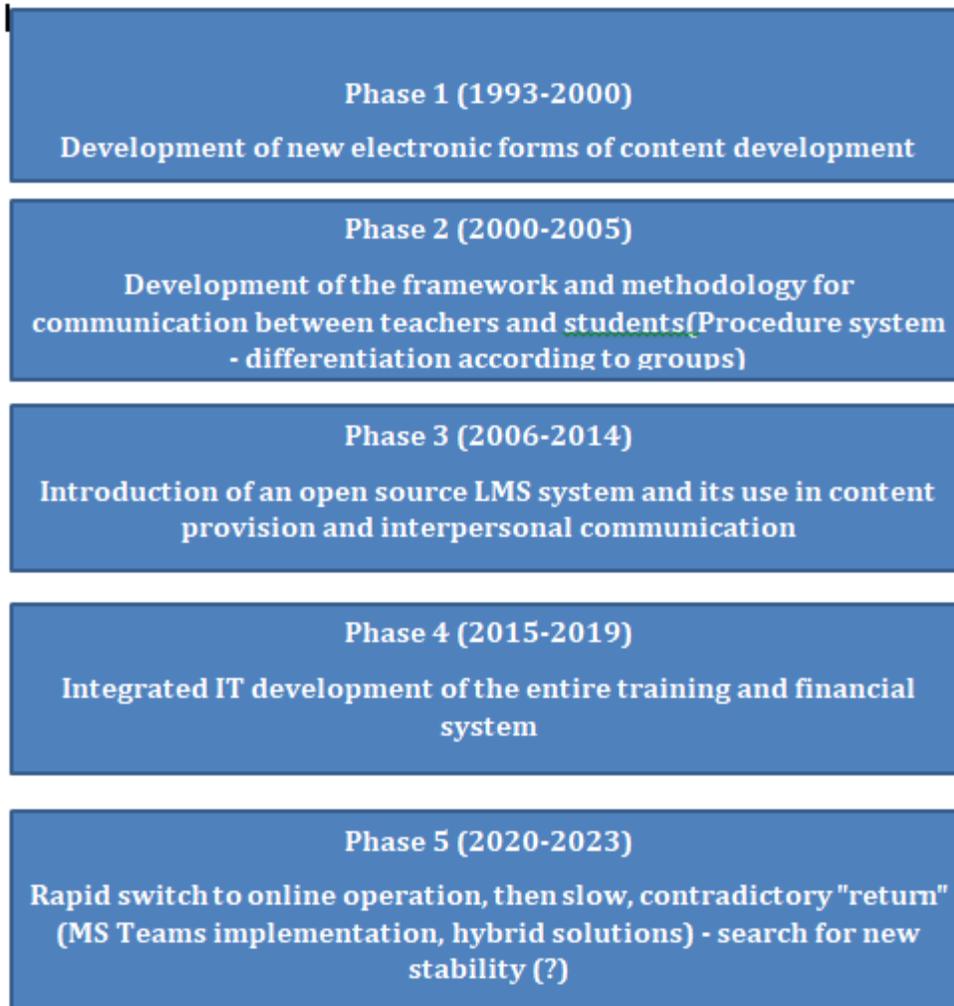
Figure 3. Implementation stages of digital transformation in the continuing training.

Based on the historical analysis of the development of the model works described above, the following phases of the digital transformation can be distinguished:

• In the first phase of the development of the continuing education model of the new specialization, the innovation was aimed at the development of electronic forms of content development and the full support of the distance education forms typical of the given period with content elements. Initially, this meant educational packages (video cassettes, printed materials delivered by mail, traditional notes), but at the same time, high IT support appeared in their development processes.

• After the turn of the millennium, between 2000 and 2005, the frameworks between instructors and students were formed, in which the elements of group work and collaborative learning appeared. The next phase was when the elementary systems (MOODLE) were built between 2006 and 2014, which required a modern IT infrastructure

and the preparation of exceptional specialists (IT specialists, e-learning specialists) and trainers and consultants in the specialized continuing education program.

• Between 2015 and 2019, the education organization and administration system (Neptune), which initially developed in parallel, and the financial financing system were also integrated step by step, which greatly facilitated the organization of training and the development of effective forms of financing.

• In the spring of 2020, due to the well-known world crisis, it was necessary to switch to full-scale online operation, which was done extremely quickly and successfully based on history. It was then that the implementation of the MS Teams communication software was introduced and has been continuously used ever since. Despite the initial successes, the subsequent period also brought to the surface many contradictions: the problem of returning from the total online operation, the limitations of hybrid solutions, and the unanswerability of quality assurance questions related to online solutions.

When analyzing the theoretical and practical connections of the process, it is advisable to analyze the adult education characteristics of the process taking place between 1993-2023 in parallel with the digital transformation. One aspect was based on a comparative study with international trends analysis, which resulted in the development of a new distance education model. From a methodological point of view, the research and development being described was essentially action research. Significant is that network structures were created, consisting of development groups consisting of teachers working in small groups and senior consultants. "Distance education," which initially used classic correspondence solutions, was significantly transformed after the turn of the millennium precisely due to digital transformation. Education framework systems (LMS) and online solutions that make network communication continuous were developed between 2010-2018. Thus, at the beginning of the pandemic, the transition to online teaching and learning was relatively smooth for this course. At the same time, a new risk factor has appeared, the importance of which cannot be neglected shortly: System shutdowns and malfunctions can severely impact professional prestige, so the issue of operational capability and data protection security is unavoidable. Despite all these risks, there is no alternative to the further expansion of distance education/online type services in the case of further specialized training. Up-to-date content in a flexible form, with increased consideration of the students' living and working conditions, can only be solved with the effective operation of these solutions.

4. Conclusion

Among the many stories of the digital transition, it is presumably symbolic that this training improves the knowledge of school principals and heads of institutions in the success story

presented above. We can also put it as a constraint and an opportunity for innovation when we can understand the paradigm-changing challenges of the digital age and face them constructively. That is why the fundamental question of educational science is the following: How can we manage the changes?

This form of training also proves with data that ways and opportunities can be created for quality training alongside work within the lifelong learning framework. The continuously perceptible high level of student satisfaction indicates that, in addition to the many tensions of our current way of life, the busyness that is more significant than average, and the confinement caused by the pandemic between 2020 and 2022 in the last few years, the prominence of online communication solutions can give a realistic chance of realizing the training goals.

In the current state, considered by many to be temporary, we have a way to look back and look ahead to prepare for the next period. There are professionally based arguments that draw attention to the fact that crises create favorable conditions for innovation. Richard Sharpe (Sharp, 2020) drew attention to the innovation experiences of education in dramatic circumstances, stating that during the pandemic, innovative activity in dealing with problems increased significantly. However, remote working did not mean work performance had deteriorated. Creative solutions came to the fore, and new communication techniques also helped to strengthen social relations. In addition to these changes affecting the innovation potential, the cautious passivity of large systems can also be detected. Many have already established that returning to the same systems and procedures is impossible. The presence of risks and the fear of them are perceptibly present, as many people do not want to use traditional solutions in the future due to the risks associated with them.

Presumably, thorough consideration is required as to what can become an essential element of continuous operation after successful application (for example, asynchronous learning and the use of social portals related to it) and which ones, in the case of which practice contradicts further application. In the past weeks and months, it was noticeable that traditional regulation can often become a barrier to innovation, especially the rigid management of financial processes, as well as the delay in decision-making, the lack of synchronization between professional solutions and the provision of their conditions, in some cases significantly limited the sustainability of new solutions. It seems that the "steepness" of technology transfer enables quick reactions. However, simultaneously, the "danger" of checks and balances, of returning to old solutions, is closely related to the human factor, which once again makes it essential to renew the pedagogical approach and consistently apply new pedagogical values.

Unfortunately only few comprehensive analyzes are available on the latest developments in the digital approach of higher education in the Central-Eastern European region, particularly with regard to the period of the pandemic. Therefore, scientific debates

and critical characterizations are ahead of us in this regard. This paper intends to make a contribution by illustrating the difference in the relatively longer period of the digitalization process by presenting the history of the development of teacher training and distance education. The new frameworks created by the digital transformation can be an innovation result that has the characteristics of the general application of online frameworks in the new ICT environment due to the capabilities of the technical tools used there. However, at the same time, the acquisition of experiential knowledge in the collaborative work process significantly reduces the risk that newer and newer elements of common knowledge carry verification risks. Content sharing and data security are characteristics that we consider essential in the current experimental educational environment. Cloud services provide users with more significant and differentiated archiving capacities and combination options than before so that data security requirements can be consistently enforced.

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