Learning Portfolios and Proactive Learning in Higher Education Pedagogy

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Abstract—The study presents the results of an experiment in methodological development in vocational teacher training. The author describes his own professional experience based on a four-year higher education pedagogical experiment. The experiment was carried out within the framework of a four-semester specialist teacher training program that leads to a pedagogical qualification. Students on the course have usually undertaken several years of internship, and several of them are instructors in vocational training, adult education, or higher education. From a pedagogical point of view, the experiment presented in the article is also special because it presents the in-service training of teachers who teach in secondary education within a university framework. Based on feedback from previous years, students considered the obligation to prepare diploma dissertations to be either a formal obligation only, or a "necessary evil." The diploma dissertation that concludes the course takes the form of a professional dissertation, the topic of which is defined by the department and selected by the student, and represents the mandatory and almost exclusive form of individual assessment related to the student's final exam. The four-year higher-education pedagogical experiment described in the article presents the first results of a method for replacing the diploma thesis with the preparation of a portfolio. The article shows what kind of pedagogical change in methods a portfolio-type diploma thesis requires, and what the important elements of this are. It shows the effectiveness of assessment based on a portfolio-based dissertation using feedback from students from the last four years of the course, the former which was integrated into a proactive pedagogical framework in a comprehensive way during the experiment. The article also sets out the general conditions for doing this that may be relevant for other training courses, in particular in engineering and the social sciences.

The topicality of the article is also strengthened by social and professional expectations surrounding higher education. Consequently, the author of the article presents this experiment in higher education pedagogical design not as an opportunity, but as an essential innovation.

Keywords—Active learning, Assessment of learning, Blended learning, Collaborative learning, Conceptions of teaching, Educational development, Evaluation, Flipped classroom, Learning styles, Reflection, Self-assessment, Teaching portfolio.

1   Introduction

Based on Eurostat (statistical office of the European Union situated in Luxembourg), the average proportion of people with a tertiary education in the European Union (EU) was 40.3% in 2019. The indicator refers to the proportion of the population aged 30-34 who have successfully completed ISCED 5-8.

The ISCED is a statistical framework for organizing information on education maintained by the United Nations Educational, Scientific and Cultural Organization (UNESCO).

This was ten percentage points higher than for 2008. The share of the 15-24 age group with a tertiary education in the total population in 2019 was 2.67 percentage points lower than in 2008. The difference between the two values thus increased from 17.8 percentage points to 29.7 percentage points. Based on our own calculations, if the values for the next five years (until 2025) are adjusted by changing the 11-year average, the gap will increase to 36.2 percentage points by 2025. These values were calculated on the basis of Eurostat data for 27 Member States (but similar dynamics can be identified on the basis of data for 28 Member States, and even for the 19-euro area countries).

Obviously, there is a difference between the two age groups under analysis which may be subjected to more analysis by shifting the scale, and the estimate until 2025 could be further refined. From the point of view of our topic, however, the figures and trends provide sufficient evidence to establish that **higher education in the EU has become more valuable, and more applicable to wider social groups.** This does not mean that the absolute number of students in universities will increase in the next five years, because demographic trends indicate that there will not be enough new university students. **The increase in the proportion of people with higher education within each (ascending) age group may be inversely related to the quality of higher education.** Correction of this phenomenon requires system-level intervention. On the one hand, by **improving the quality of secondary and primary education** the level of knowledge and skills of entrants can be raised to the level of 10 years ago, and on the other hand, **pedagogical innovation in higher education can maintain the quality of graduates.**

To conclude the line of reasoning, we believe that the added value of higher education should increase in direct proportion to the difference (in percentage points) between the two metrics illustrated in Figure 1.

CHANGES IN THE NUMBER OF YOUTH AND THEIR TERTIARY EDUCATTIONAL ATTAINMENT
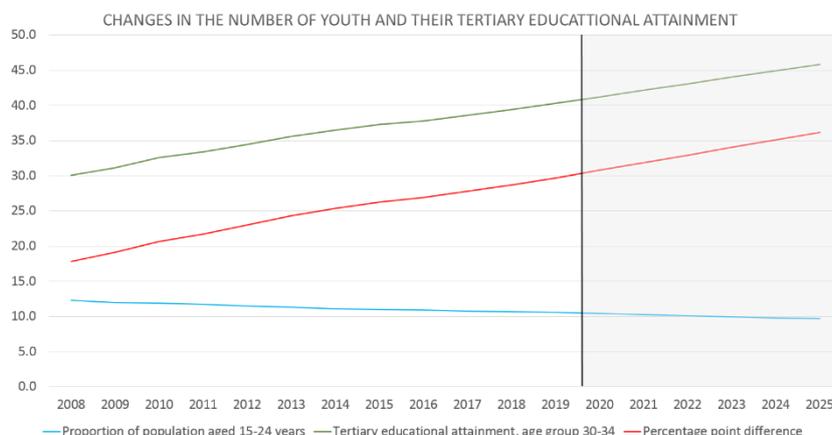
Fig. 1.

All these claims would be valid if economic and social expectations about higher education performance were likely to remain unchanged. However, this is not the case because **higher education is constantly required to create more and more professionals with greater ability and immediate prospects for employment** [10]

2   Literature

The statistics clearly show that the increase in the number of students in higher education is not a consequence of population growth. Thus, we can observe a welcome increase in the total number of students, which, however, is not followed by the qualitative development of incoming students. It follows from this **that pedagogical innovation in higher education should not only be considered an internal affair for the university world, but an essential precondition for societal and economic development**. There are many ways to rethink the mission of educators. The most effective methods can be derived from a combination of theory and practice, such as Design Thinking [15]. The point is that there is a need for the pedagogical renewal of higher education, which in many cases means developing pedagogical practices from the ground up. We have been engaged in curriculum development, and it is our experience that in some universities the term pedagogy is best understood within the departments whose names refer to it. As a result, higher education pedagogy must carry out new experiments in terms of content, methodology, and evaluation activities.

Based on our university experience, it is difficult to steer non-pedagogical teaching colleagues towards using new methodological approaches to teaching. Therefore, a well-interpreted "objective" element had to be developed around which the new pedagogical model could be built.

Some of the milestones in the research logic that underlies this article are:

- Finding 1 (Figure 1.): Despite the negative spiral of demographic processes, increasing participation in higher education threatens the quality of the former.
- Finding 2 [10] The standard of higher education should be raised in line with the labor demand of the economy.
- Finding 3 (own experience): The two processes require the drastic transformation of traditional higher education pedagogy. The pedagogical culture and diversity of higher education, based on our more than 20 years of experience in the field, does not, or only with difficulty, enable pedagogical innovation.

Researcher reaction: On the one hand, there is a general compulsion to innovate, and on the other, there is organizational culture and knowledge, which is difficult to innovate. Under such circumstances, **pedagogical innovation must be undertaken in an objective format**, which was the reason for replacing the *student dissertation* on our training course with a *portfolio* in the experiment. However, this involves **only an intermediate "stage" of innovation**, because **the point is to introduce a pedagogical process** that can, most hopefully, conclude with a portfolio. This process is called proactive teaching.

That component of completing higher education that is considered natural by almost everyone is the preparation of a diploma thesis, or a final dissertation. Such dissertations are prepared by students independently of the supervision of a university lecturer. In this way, students account for the knowledge they have acquired by choosing one of the topics selected by their department. The dissertation usually represents the student's current knowledge well, but does not represent the process of competence development, thus it is not possible to deduce from the final dissertation what development potential the student has, and their own position in relation to areas of or the whole of the profession. A student presents and receives a snapshot of their own abilities, but this form of assessment cannot be used to create an individual learning plan. The competences of graduate students, such as problem solving, logical thinking, communication skills in personal and online relationships, the application of artificial intelligence to professional work, innovation skills, and many other similar skills that are expected in the labor market, are difficult to judge on this basis.

This article presents the elements and results of the related experiment. We chose the **"dissertation" as a central element of innovation, and organized a proactive pedagogical method around it**. The experiment was implemented for **four consecutive years (2016-2020)** as part of the training of vocational teachers (VET teacher). **One group of students did not have to write a dissertation**, but instead put together a so-called portfolio of their most important achievements during their studies and expanded on these with their own reflections. The possibility for creating a broader discussion of our experiences and results are described herein.

3 Research Methodology

It follows from the Eurostat data presented earlier that **continuing education has recently shifted to a focus on higher education**. More groups of individuals in society are seeing the need to expand their knowledge and competencies within the framework of higher education. The 10-point increase over a span of 10 years also means **that graduates leaving the system envisage continuing their further education not at a secondary level but at universities**. The pro-environmental Bologna system facilitates broader interoperability between institutions in EU Member States, creating an ever-changing organizational culture in universities. Our students, especially those participating in graduate-based courses, have consistently indicated that a dissertation is not the most appropriate way for them to demonstrate their progress in training and complete their course of study. They feel that the development of their knowledge has been much greater than is possible to sum up in a single dissertation. Based on this fact, we launched an experiment involving building a portfolio.

The chosen research method is called a **design experiment**.

The five characteristics of Design-based Research Collaboration [3] were developed in our case in the following way:

1. The goals of creating a learning environment and related theories were connected.
2. Development and research were cyclically redesigned, analyzed, implemented, and reiterated. Each cycle occurred at a pace adapted to the order of the school year.
3. Our findings generated relevant theories and findings that were of use in the work of practicing university lecturers.
4. The research was carried out under authentic conditions.
5. The research was based on methods that are able to document and connect the implementation process with student and teacher interests.

We have undertaken dozens of iterations of curriculum development, and it is our experience that at some universities the term pedagogy is best understood by the departments whose names specifically refer to this topic. As a result, higher education pedagogy should engage in carrying out new experiments regarding content, methodology, and evaluation activities.

At Corvinus University of Budapest we have been conducting a methodological and evaluation-based experiment from 2016 onwards within the framework of VET teacher training.

The experiment consists of a so-called proactive learning method and the evaluation process that accompanies it. This method characterized by preparatory knowledge building and the expansion of student and teacher cooperation throughout the entire semester. Students who participated in the experiment were evaluated by compiling a portfolio.

- One of the aims of our experiment was to investigate whether performance measurement in higher education pedagogy can be carried out through portfolio-type evaluation.

- Another aim of our experiment was to examine whether the efficiency of knowledge transfer in higher education pedagogy could be improved through a proactive learning process.

Pedagogical model experiments are discipline independent. Consequently, the understanding of any branch of engineering science can be tested and applied in the framework of the training of an engineering teacher.

4 Results and Discussion

4.1 Importance of a portfolio in VET teacher training

In Hungary, the contents of this type of portfolio are detailed in the Annex to EMMI Decree 8/2013 (I.30.) on common requirements for teacher education and training and output requirements for each teaching period. Based on the law, we defined specific areas of competence for our VET teacher training.

Looking at the overall model of teacher competence, questions were raised about the methods and form in which we could assess learning achievements at our university during the training of VET teachers. The problem is becoming more pressing with the advance of competency-developing pedagogical methods, as all educational institutions are now experimenting with some forms of supportive assessment methods. These involve identifying an intelligent method that determines WHERE the learner is going in the learning process, WHAT direction they should go in, and, through evaluation, HOW they can achieve this. The existence of this "WHERE," "WHAT DIRECTION," "HOW" triangle can be found in all modern evaluation methods. A supportive assessment is one in which the trainer does not return a grade to the learner after appraisal, but offers them a personalized response by assigning learning paths.

Assessment methods can be used as system components linked to the learning-teaching process [8] The portfolio as a supportive assessment method may be built into the learning process, during which the teacher facilitates self-assessment, thus ensuring the process of development. As part of the assessment, students not only document their own knowledge, but also their learning process, and thus become more aware of the latter.

The **learning organization challenge to be addressed is how to overcome the problem of generating a single assessment framework in a context in which different subjects use different learning tasks and assessment methods**.

At Corvinus University of Budapest, we conducted model experiments that document student competence and describe their development across the full range of requirements. The essence of the method is that students, through a so-called learning portfolio, coherently bring together the various elements of their competence development and consolidate this into a **single document, which they evaluate themselves** using the methods they have learned.

The introduction of the learning portfolio assumes that students are considered professional partners. A high level of professional commitment and **learning motivation**

can be measured among participants on such courses, including in the area of VET teacher training and further training. A considerable investment of time, money, and human capital is demonstrated by trainers and trainees. This high level of commitment provides a particularly suitable environment for higher education methodological innovation. Pedagogical innovation involves documenting the learning process and progress of individual students. At the same time, responses to learning tasks should be (by the law) assessed using evaluation, which means grading according to predefined criteria.

In the present study, the applied pedagogical method is called the proactive learning model. By this designation we seek to emphasize that the student-teacher relationship focuses on the process of preparation that occurs before classroom meetings. Learning is not organized in terms of lessons, home learning, and exam sessions. Through proactive learning, students use Information and Communication Technology (ICT) systems to prepare for class, to get to know their classmates, and to collect and process data. They ask questions, answer questions, and approach the topic individually. During class, they engage in a higher level of information processing and reflect on the whole process based on their personal impressions.

They collect these impressions and their own ideas and reflections during the learning process, and draw up a kind of developmental story and description. This is the actual portfolio.

The use of a portfolio as an assessment method is an integral part of the proactive learning model. The implementation of the portfolio requires a Proactive Learning Model, and within this model, a portfolio is considered the most appropriate assessment method.

4.2 Features of the proactive learning model

The Proactive Learning Model is a student-centered pedagogical approach that aims to increase student engagement, understanding, and the acquisition of curriculum material. The way to do this is to "reverse" the traditional educational approach. This means that it is not the university lecturer who introduces the curriculum to students, who then learn it through processing, but the process flows in the opposite direction: students come to lessons with knowledge of the curriculum that is processed and classified. In most cases, students inform the university lecturer of their questions and assignment needs before class, so the university lecturer can engage in goal-oriented pedagogical work during class and throughout the semester.

The so-called "flipped classroom" method is similar to this model.

The **difference between a "proactive learning model" and a "flipped classroom" is** that, in addition to mastering the curriculum, methodological development is an important part of training too. Therefore, students' progress **not only by acquiring material knowledge, but also by recognizing the underlying pedagogical considerations**.

One of the reasons why this model was developed further is because the literature [7] suggests that it allows for the more efficient use of classroom teaching time, given that the teacher can focus on the practical application of knowledge within the school context. During VET teacher training, there are several intensive (full-day) teaching days. As a result, the first meeting of a heterogeneous group of students in relation to a

topic involves a major challenge for teachers and students alike. Under these circumstances, preliminary preparation can result in rapid improvements in efficiency.

The Proactive Learning Model combines several pre-established methodological approaches, including:

- Collaborative learning
- Cooperative learning
- Problem-based learning.

Each of the above methods promotes useful learning and the involvement of students in the learning process, enabling students to increase their learning autonomy [16] and teachers to succeed.

In the proactive learning model, the majority of teaching staff members found that student performance improved and student learning motivation increased. Almost every trainer who has tried this model would like to implement it at a system level.

Proactive learning increases the innovative potential of classroom activities [5] an approach that is in itself beneficial to students.

"The learner centered approach is a strategy that includes active learning, cooperative learning, and inductive learning. In active learning, learners solve problems, answer questions, formulate questions of their own, discuss, explain, debate, or brainstorm during teaching/learning sessions" [6].

In our view, large groups can particularly benefit from the technologically facilitated process. Groups of 300 higher-education students can engage in active learning, while groups of up to 20-30 students can be organized to create more positive experiences with a subject. As a result, students' motivation can be increased by giving them the opportunity to be better prepared for classroom work.

Active learning requires students to engage in meaningful learning activities and think about what they are doing [2] As a result, students become committed and motivated [9] to participate in the learning process.

ICT-based tools created by innovation and technological advancement can significantly help educators to increase student engagement and motivation. Educators can create learning resources through a variety of platforms and services (it is easier to identify good practices from students and student groups). Such enhanced, adaptive use of technology, in parallel with the student-centered approach, can facilitate the integration of students with different learning preferences or styles into a common learning process.

4.3   Proactive learning as learning transfer

A tangible result of proactive learning is portfolio creation. Portfolios are made individually by each student through a complex process which in itself requires new skills. Collecting and selecting information, commenting, shaping, weighting, implementing, and recognizing mistakes, participating in the process of reflection, writing reflections, and planning future activities develop students' skills and help them strengthen their self-motivation and self-regulation. **Our experience in previous years**

has shown that it would be a mistake to assume that these qualities are fully developed and present in students from the outset, and moreover in educators. Therefore, the first and most important criterion when introducing a learning portfolio should be the provision of ongoing support. A lack of continuous support can result in students experiencing failure and ultimately, failure of implementation.

In our experience, without this supportive process, students' reflections involved, at best, few-sentence-long descriptions of what had happened during lessons.

In other words, students showed a clear lack of understanding of the reflection process and thus could not understand the essence of the learning portfolio, and consequently could not use it in their later work.

We evaluated all these factors in our university workshop and came to the following conclusions:

1. The introduction of the portfolio requires a new pedagogical strategy.
2. Students should be made aware that portfolio development is not a pedagogical goal but a pedagogical tool.
3. The goal is not to prescribe the use of a portfolio, but to develop one as a natural result of the learning process through teacher-student cooperation.
4. The portfolio is thus a joint product of the student and the university pedagogical workshop that is created during university studies, which is then carried forward by students as a living collection of knowledge, and independently expanded and shaped during their careers.

These conclusions were drawn from our findings that students often used "reflection" in the sense of simply documenting or describing their views about what they had learned. **In our view, however, they also need to demonstrate in their reflections what "depth of learning" they have achieved**.

In addition to content that is learned, students must recognize the new skills they have acquired. They should compare them with the literature, their own experience, and the experience of their environment. They should then develop a learning strategy to deepen their knowledge and to help them apply a broadly critical approach. Sometimes they are required to do their own empirical research. Once this is done, they must summarize it in a successful reflection, sometimes including open-ended questions.

However, this summary is more of a discussion paper than a documented outcome.

The student should interpret the resulting independent piece of work in terms of formulating a future system of tasks (when students analyze their own skills, it is most useful to combine this process with other tasks, rather than simply describing a particular exercise). **All this reinforces the ethos of "lifelong learning"** in personal and professional life. The term "ethos" here refers to "lifelong learning" as a form of behavior; an act that an individual considers to be guiding and replicable.

Our approach to portfolio design is based on a **theoretical approach to learning transfer**.

The literature on learning transfer mostly describes failures and mistakes that should be avoided. Early reports about the initial successes of learning transfer showed that **successful knowledge transfer strategies can be developed through more routine**

activities such as playing darts like Judd presented [12] or doing card tricks as Katona did it[13]. This activity reflected on the results obtained from understanding strategies through the use of mutual learning [14], and the effects of learning transfer on different tasks and planned learning situations. Nevertheless, the reasons for the failure of learning transfer were specified as objective factors.

The failure of learning transfer does not mean that transfer is impossible. These failures certainly indicate that transfer does not occur as easily as one would expect, and in many cases does not occur automatically. The transfer of learning cannot be taken for granted. To ensure that transfer takes place, we need to clearly understand the nature of the learning transfer, and carefully plan instructions and manage individual situations.

The design of the learning program is more important than that it was earlier. Throughout the design process "the emphasis has been on teaching for usable, applied knowledge, including the choice of content and processes, motivation, reflection and problem-solving, choice of technology, effective teaching methods, models and strategies" [11].

In our experience, so-called "generalizing" theory can be applied simply and unambiguously to the design of any portfolio process. This theory understands that knowledge transfer is primarily based on generalization, and the level of transfer depends on how students interpret and consolidate experiences in the learning situation, and how they are able to draw generalizing conclusions.

Better knowledge transfer is possible if we understand the principles. The process of our learning transfer theory in relation to the introduction of portfolios is shown in Figure 2.

The figure shows the level of knowledge vertically, leading from the bottom, involving practical knowledge, to theoretical knowledge. Horizontally, the steps in the learning transfer process lead from practice to theory, and then become elements re-injected into practice.

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Learning transfer process (1.-4.)			
Obtaining new experience (1.)	Synthesizing experience (2.)	Transforming experience into knowledge (3.)	Applying new knowledge (4.)
		Transforming situations based on one's own experience into general theory.	
	Generalization of a familiar situation based on individual experience		
Given, familiar situation.			Direct application of general theory in current and future situations

(Left vertical axis: Levels of knowledge (I.-III.) — Level of scientific generalization (I.); Individual's level of generalization (II.); Level of practice (III.))
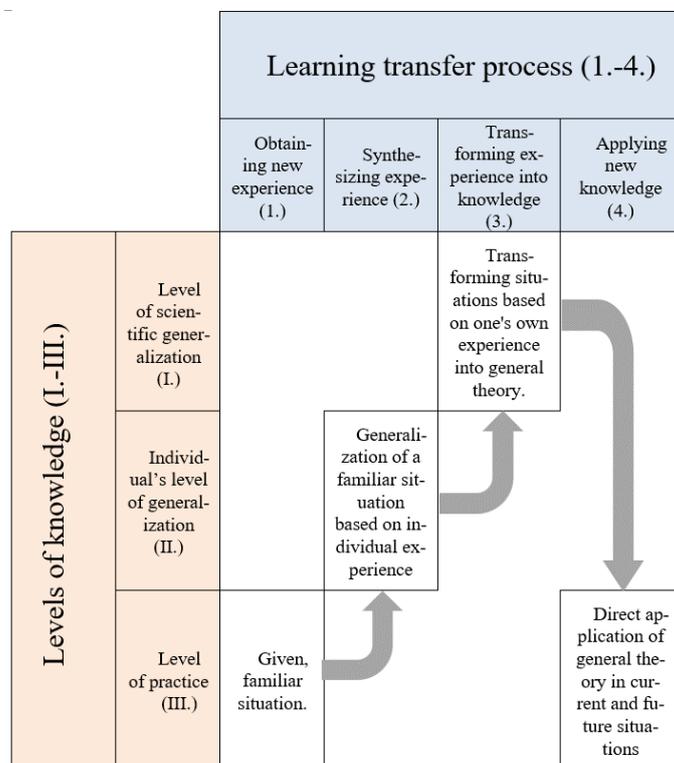
Fig. 2. The learning transfer process used to introduce a portfolio based on "generalization" theory; author's construction

A true reflection of student progress is when they "learn or recognize a situation" during their training that they are able to connect and **synthesize with their own experiences and knowledge**, thus enabling them to deduce personalized generalizations from the situation. The latter are then processed through research, analytical work, and other new knowledge learned during training, and elevated to a higher theoretical level.

Students go through this process in order to apply the outcomes directly to their own roles in later work. For the portfolio, we ask students to describe this process as the backbone of their reflection.

Facilitating the process of understanding, processing, documenting, and applying requires other organizational methods from trainers.

4.4 Teacher motivation for the proactive learning model

The Proactive Learning Model offers opportunities for direct interaction with students. It enhances the development of more complex skills, critical thinking, and problem-solving through analysis, evaluation, and common problem solving. Especially in larger groups, this form of interaction, often due to its peer-review component, provides educators with more tools for transferring knowledge and increasing students' level of

understanding. As an educator, you can improve student performance by focusing on the quality of interactions. An essential element of peer-review is providing feedback at a time when students are motivated to learn. Peer-review is a state-of-the-art assessment methodology that can prepare the teacher for assessment [4].

The Proactive Learning Model is fundamentally student centered and can therefore be used advantageously with heterogeneous student groups. There are several ways to facilitate understanding of knowledge, including by providing students with basic information asynchronously. They can flexibly access the curriculum according to their needs, whenever they feel the need to. Students may benefit from reflecting on curricula and concrete concepts through questions and discussions with the teacher [1] Students work with their peers to solve problems based on the content of lectures. They work on their own solutions together with group mates and teachers through presenting arguments. During studying, learning units are created through classroom experiments.

The Proactive Learning Model is a student-centered model designed to increase student engagement in learning. The model increases the efficiency of time management in classroom contact lessons. This is mainly because students come to contact classes with prior knowledge about the curriculum. Before the lesson, they have already consulted with their teacher and student colleagues using supportive ICT systems. In many cases, they have worked in a collaborative, virtual student group. Compared to the effectiveness of large frontal lectures (200-500 people), this method creates more object knowledge, improves collaboration and interaction, and fosters a greater learning and understanding experience, not to mention that the teacher has the ability to organize smaller groups and communicate directly with them. All these factors lead to an increase in **students' motivation to learn**. Although the process means more work for the university lecturer, this can be offset by efficiency gains and continuous renewal based on personal relationships.

5 Conclusion and Future Research

One of the aims of the design experiment was to identify pedagogical methods that help develop students' professional commitment and learning motivation to a high level. In our experience, this acquisition of knowledge and motivation for learning is essential for the successful introduction of portfolio-based assessment. If this complexity is not experienced, efforts should be made to increase motivation, while it should be recognized that the introduction of a portfolio system will be more difficult for a university or department.

In Example 1, a student's motivational goals can be understood in the form of mission-statement-like wording.

1. Student example

"My decision to apply for a master's degree was guided by my future goal of enriching my methodological knowledge through daily practical work my own business with my studies and expanding it with the latest scientific results and passing on my knowledge to students."

The portfolio also provides an opportunity to adjust part of the training to the sources of motivation and success criteria of students, and for the collaborative development of the structure of the portfolio. Based on knowledge about the previous experience of students with a complex professional background, learning transfer to the teaching profession may be planned. One potentially complex challenge is to introduce this approach to the student, in line with Example 2.

2. Student example

"I started and managed businesses for decades. During this time, I gained extensive business knowledge and pedagogical professional experience. Over the years, it has become a more and more urgent desire for me to pass on my more than 25 years of professional experience in business management and company establishment to young people. In 2017, I decided to apply for the teacher training course initiated by Corvinus University of Budapest."

An important element of portfolio introduction is raising awareness of the learning transfer process. Students should be introduced to each step of this. However, care must be taken not to introduce the process in direct ways to avoid the execution of the portfolio becoming overly formal. Experimenting with educational methods guides the student through the transfer process on their own. Luckily, as the quote from Example 3 shows, students may realize this themselves (thoughts related to the learning transfer process have been highlighted).

3. Student example

"During my studies related to the present course, **I became aware again** of the importance to me of **combining theoretical knowledge with practical knowledge** in the implementation of authentic education. In my opinion, with this dual body of knowledge, **I will really be able to** prepare my prospective students for the challenges an entrepreneur has to face if they want to start a business at the SME level."

We can also successfully apply the methods of learning transfer that are expected in the portfolio at each stage of the training. For example, a learning unit may be closed with a case study. Example 4 indicates positive student feedback about this approach.

4. Student example

"During my training, I appreciate the fact that, in connection with the area of professional methodology, we were not only required to take a theoretical test from our students *(in the school where this student act as a teacher, author's comment)*, but we also had to prepare case studies. In my opinion, these in themselves establish the seriousness and future success of professional teacher training, and also help me to adapt the knowledge I acquired regarding the professional basic training of economics to the basic training requirements of the field of science."

As indicated in the previous chapter, one of the measurable outcomes of the portfolio construction process is that it reinforces a commitment to "lifelong learning." Example 5 includes a sentence from a portfolio of one of our students.

5. Student example

"I compiled my portfolio using materials prepared during my studies and internships. It is not quantity / time that is important in this work, but quality. One sees a career in education and educating students as the profession of a true educator. I think it is important for the teacher to have the constant ability to innovate. We can critically analyze what results have been achieved, and re-evaluate what needs to be done by drawing lessons through self-reflection."

In our experience, portfolio-type assessment and the related process of support have not yet reached the level in higher education learning systems that can fully contribute to the effective development of the quality of training.

The experiment we are carrying out can be considered an isolated one within Corvinus University of Budapest as an institution.

This pioneering work, according to some views, dilutes the rigorous requirements of examination, and may thus lead to an improvement in the professional qualifications of graduates. However, our experience shows us that, compared to the pedagogical readiness of higher education, the introduction of a portfolio approach is premature at the system level, so **portfolio-based innovation should only be tried as part of more comprehensive methodological renewal**.

It follows from all this that **success and sustainability require high quality planning, preparation, and strong institutional commitment.** If this is lacking, it may result in initial rapid successes, but stable development cannot be ensured, and any failures that occur may lead to the long-term rejection of such experiments.

We hope that the examples we have presented confirm the commitment of those working on the pedagogical renewal of higher education, and that we have been able to demonstrate that the portfolio approach is useful.

- For increasing self-motivation
- For the development of cognitive observation
- For making lifelong learning a lifestyle.

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