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Crisis Management of Dual Training in Sustainable Synergy at a Higher Education Institution

Bir Yükseköğretim Kurumunda Sürdürülebilir Sinerjide İkili Eğitime İlişkin Kriz Yönetimi

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ANAHTAR KELİMELER

İkili eğitim
Yüksek Öğretim Kurumu
Kriz yönetimi
Sürdürülebilirlik
Dört boyutlu model

KEY WORDS

Dual training
Higher education institution
Crisis management
Sustainability
Tetrahedron model

ÖZ

Alman modelini temel alan uygulamaya yönelik ikili eğitim artık Macaristan dahil Avrupa Birliği genelinde yaygındır. Yükseköğretim kurumları, özellikle uygulamalı bilimler üniversiteleri, endüstriyel ortaklarıyla birlikte, işgücü piyasasının ihtiyaçlarını karşılayan ve bunlara sürdürülebilir bir şekilde uyum sağlama konusunda esnek olan eğitim kurslarını önermektedir. Çalışma, bir pandeminin kriz olarak etkisini ve yönetim olanaklarını belirlemek için Dunaújváros Üniversitesi'nde yapılan bir anket araştırmasının sonuçlarını sunmanın yanı sıra, sürdürülebilirlik araştırmalarında uygulanabilir yeni bir tetrahedron değişim yönetimi modelini ortaya koymaktadır. Yükseköğretim kurumlarındaki krizler sırasında, Rus-Ukrayna savaşının neden olduğu enerji krizi sonucunda, Dunaújváros Üniversitesi'nin sürdürülebilirlik adına kış aylarında tekrar çevrimiçi eğitime geçmesi, çalışmaya ayrı bir güncellik kazandırmaktadır.

ABSTRACT

Based on the German model, practice-oriented dual training is now widespread throughout the European Union, including Hungary. Higher education institutions, universities of applied sciences in particular, together with their industrial partners, offer training courses that meet the needs of the labour market and are flexible to adapt to them, in a sustainable way. The study presents the results of a questionnaire survey at the University of Dunaújváros to determine the impact of a pandemic, as a crisis, and the possibilities of its management, as well as introduces a new tetrahedron model of change management applicable at the research of sustainability during crises at higher education institutions. The fact that the energy crisis caused by the Russo-Ukrainian war forced the University of Dunaújváros to switch to online education again in the winter months for the sake of sustainability gives the study particular topicality.

1. Overview of the global situation of dual training in Hungary

In both developed and developing countries, rising youth unemployment is a growing and serious challenge, with the level of demand for recent graduates higher than that of labour market actors, creating a potential gap in expectations. To mitigate this, effective dual training programmes based on a combination of classroom-based theoretical education and practical skills development are being used. As a result, the skilled labour market is developing and the demand for workers is better met. In

many countries, dual training models have spread as a way to combat youth unemployment (Zimmermann et al. 2013). In Germany, Austria and Switzerland, such approaches have worked effectively and have evolved over time, raising the question of whether dual training models can work in other countries with similar positive results. In various countries, dual training opportunities have been developed through project work, but it has proved almost impossible to find examples of successful long-term adoption and application of dual training models (Gonon 2014; Valiente - Scandurra 2017).

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However, there are no detailed academic findings on these projects. Stockmann and Silvestrini (2012), as part of a meta-evaluation of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), examine the outcomes and usefulness of international vocational training projects, which after analysis concluded that most projects were small-budget pilots and not sustainable. They were mostly based on bilateral or multilateral cooperation agreements and focused on public cooperation to address challenges, mainly as a way to reduce youth unemployment.

The German model of dual training, in which young people are prepared for their careers by combining practical training in companies with vocational school education, is becoming increasingly popular. Under an agreement reached with Germany three years ago and with the involvement of the European Commission, Spain, Greece, Portugal, Italy, Portugal, Slovakia and Latvia have all agreed to adopt the structures of the dual education system in order to have a well-functioning dual education system to strengthen the labour market. Russia is using the same system to train mechatronics technicians, warehouse logisticians, bakers and cooks; in India, the first group of young people are learning the basics of metalworking; and in Brazil, toolmakers are also undergoing dual training.

There is also cooperation with China and Thailand. In Malaysia, there is already a vocational qualification based on the German craftsman's qualification. However, implementation faces a number of problems in Slovakia, where a new vocational training law had to be enacted before the system could be launched (European Commission, 2021). Overall, this start-up initiative by the European Commission recognises the diverging interests and focuses primarily on the transfer of the dual training model per se, rather than on an analysis of the advantages and disadvantages. The focus on the dual system in the context of the transfer debate reflects the intense debate that has developed in recent years around this model of vocational training (Valiente - Scandurra 2017).

2. The role of dual training in the system of studies

In Hungary, people can take part in dual higher education at bachelor's and master's level in engineering, information technology, agriculture, natural sciences, economics or health sciences, as well as in social work. In a dual training system, theoretical training is provided in a higher education institution, while practical training is provided in parallel by a partner organisation. In addition to their higher education studies, students on a dual training course undertake to carry out a placement with a qualified partner organisation during their training period. As a result, 22 weeks of work experience per year can be gained during the period of university education by working for the partner company (Education Office, 2021).

The partner organisation must have an agreed dual training programme with the higher education institution (Agreed Dual Training Programme (EDKP)) to deliver the apprenticeship. On the basis of the EDKP, the partner organisation trains students according to its own needs, supports them and adds practical skills to the knowledge acquired in the training institution (Ministry of Human Resources, 2021). In a first approximation, the training is given to prospective employees who, after graduation, can become full-time potential employees with relevant professional experience and knowledge in the partner companies' organisations.

Students participating in the dual training will gain insight into the functioning of the chosen partner organisation, get to know the company culture and learn the basics of the professions from professionals. At the end of the process, they will have competitive knowledge and experience that will give them a head start in their careers. In addition to the experience gained, the partner organisations also pay students a salary, in addition to fringe benefits (e.g. cafeteria, travel allowance, housing allowance), so that they can become financially independent during their higher education studies (Dual Diploma, 2021).

3. The legal background of dual training in Hungary and at the University of Dunaújváros

The concept of dual training is defined in the Section 108 1.b. point of Act CCIV of 2011 on National Higher Education (hereinafter referred to as: Nft.). According to this, "dual training" means a special form of training in a demanding undergraduate course in the field of technical, informatics, agricultural, natural or economic sciences, or a master's degree in that field, in which the full-time, containing specific provisions for the training period, training methods, lesson, assessment of the acquired knowledge, according to the curriculum within the framework defined by the Dual Training Council, and the practical training takes place, at a qualified educational institution." Also the Nft. fixes the rules of student work, the remuneration of students (Section 44 of the Nft.); and the concept of a practice-intensive course [Section 85 (3)]. This practice-oriented, bachelor-level training, which was developed in Germany (Szabó 1997) aims to enter the world of work immediately, without several years of further training and without additional financial expenditure. In Hungary, this form of training quickly became popular due to the growing demand of the labor market, also due to the fact that it has a detailed and appropriate legal background. The domestic and international literature on the topic is also rich and constantly expanding (Berács 2017; Graf et. al. 2014). As a result of the COVID-19 pandemic, however, new circumstances have arisen in the course of training, which also offer the opportunity to outline new directions

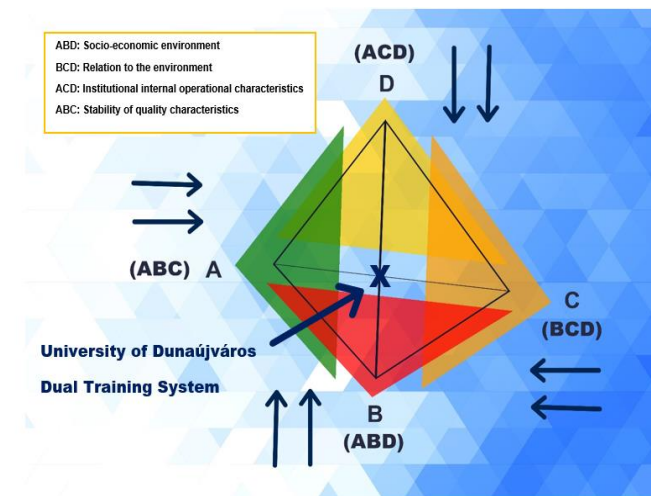
for training.

At university level the University of Dunaújváros maintains and operates the Dual Training Center, whose task is to promote training in the lives of students and companies within the university. Creates posters, leaflets and also organizes events for advertising purposes (Section 4 of the Rules of Procedure of the Dual Training Center).

4. The tetrahedron model of change management at the University of Dunaújváros

The competitive position of higher education institutions has gradually strengthened over the past twenty years and the 2020s will bring major changes in many areas. The structural, qualitative changes that define the day-to-day operations of the institutions, the necessary online education and digitalisation have required institutions to use strategic and change management tools effectively. Higher education institutions have to respond to a myriad of demands, both domestic and international, the most prominent of which has been the viral situation in the 2020s and the emergence of online education. These demands are also linked to different societal roles and responsibilities, such as the needs of students, whether at home or abroad, in normal or dual courses.

Figure 1. Quality-centred analysis of the tetrahedron model of change in the place of dual training in these subsystems



Source: edited by the authors

Figure 1 illustrates the subsystems of the quality approach for the University of Applied Sciences in the light of the quality management dimension of change management from four closely related perspectives. Along the edges of the tetrahedral model of change, the interrelationship between the elements of the pages can be traced. The tetrahedron is based on the constancy of quality attributes. The socio-economic environment, the relationship with the environment, the elements of the structure of the internal

operational characteristics of the institution can be understood.

Measures to support teachers and researchers in the assessment and validation of learning methods and key competences. As regards the recognition of learning outcomes and qualifications, the University of Applied Sciences will give priority to segments such as the emphasis on development linked to quality development, the enhancement of the role of individual research, or creativity and the strengthening of teamwork approaches. In the dimension of the stability of quality attributes (ABC), it is important to look at the development of key competences to help students make a smooth transition to the world of work. DUE's training programmes encourage students and employees, support results-oriented operations and alternative ways of transferring knowledge. The support for the development of education and training infrastructure in the socio-economic characteristics dimension (ABD) will be implemented in the following elements: taking into account different needs, changing roles of infrastructure development, competitiveness, partnership, supporting the role of online education. Feedback on environmental, economic and social challenges, integration of sustainability in teaching materials, launching of pilot projects will be integrated in the environmental dimension (BCD). Support for the acquisition of digital skills and the digital education and training process. The organisational vision of dual training is based on a common intersection. Training is located in the middle of the tetrahedron. The University of Dunaújváros, in addition to matching the existing training in its training portfolio to market needs, will in the coming period devote a significant role to the development of the dual training area. Thanks to an efficiently functioning online "infrastructure", it intends to compete for students with a marketable training offer that is also viable on the international scene.

5. Structural changes in universities changing models

From time to time, it has been argued that it is not more efficient for either the state or the universities to operate in a way that brings higher education institutions under the public purse. Under this system, the amount of funding universities receive depends on the annual central budget and the number of students admitted. The pay and promotion of teachers is determined by the civil service pay scale. Universities, partly out of necessity, have so far operated under a system that is not university-based but follows the bureaucratic mechanism of the state.

Figure 2. Main areas of model change

Source: edited by the authors

Figure 2 illustrates which areas of the current state-supported system are very inflexible and which segments would benefit from restructuring. A key element of the model, as highlighted by the government, is the possibility of more effective cooperation between universities and the private sector. At both the personal and institutional level, researchers and academics can better match their academic activities with their careers in the private sector, and the university or its individual institutes or faculties can work more flexibly with the private sector. The change of model is expected to increase the economic/financial autonomy of universities. A worrying issue on the societal side is that many of the courses offered by science universities cannot be flexibly linked to the private sector. Despite the disadvantages of the civil servant status, such as inflexibility and disregard for individual performance, it offers greater security and protection than the employment relationship under the Labour Code (Act I of 2012 on the Labour Code). The change of model therefore deprives the institutions of certainty. A criticism is the inclusion of a business perspective, i.e. the approach of thinking of education primarily as a servant of the market. If this approach is used to assess the professional performance indicators of faculties, courses and disciplines, it will have negative consequences for the institution. There are many areas, from the humanities to the arts and the less applied aspects of the natural sciences, which may be damaged by this approach, but which are more valuable than those which are seen by decision-makers as providing 'marketable' knowledge. Contrary to current experience, higher education institutions

expected the Boards of Trustees to have an essentially symbolic, representative role, representing the interests of universities vis-à-vis the political and business community. However, the legislator has given the boards of trustees a much more important role, changing the decision-making mechanism.

6. Presentation of related research

The University of Dunaújváros currently has 101 students in dual training, and with their help, a study on the effectiveness of training with an industrial background will be carried out in spring 2020, and then in spring 2021 to monitor the professional development of students. Using an online questionnaire method, primary information was collected directly from students. The target population was reached by means of questionnaires sent to e-mail addresses entered in the Neptun study system. According to the questionnaire data, the dual training courses support the professional development of students in Computer Science, Computer Engineering, Mechanical Engineering, Mechanical Engineering, Chemical Engineering, Management and Technical Management and Materials Engineering. In 2020, 14 partner training companies were interviewed for training places representing all types of training places. For students, the survey resulted in a random sample of 70% with 70 participants, while the inclusion of training experts included 6 participants in the research sample. In 2021, 14 partner training sites were surveyed. For students, the survey this year resulted in a 64% random sample of 67 people, with 5 people included in the survey of teaching experts.

Students were asked about the following topics during the survey:

- In your opinion, are students in dual training more of a burden than their counterparts in general training?
- In your opinion, what are the advantages of choosing this form of training?
- In your opinion, how does the current epidemiological situation affect the choice of dual training?
- Do you think that the current situation could cause problems for these students in meeting the practical requirements?
- What do you think could be changed in this area of training to make it more attractive to students?
- In your opinion, how could the current situation be improved to help students in dual training to meet the practical requirements of the semester as easily as possible?
- In your opinion, has the pandemic changed the relationship between dual trainers and students and, if so, how?

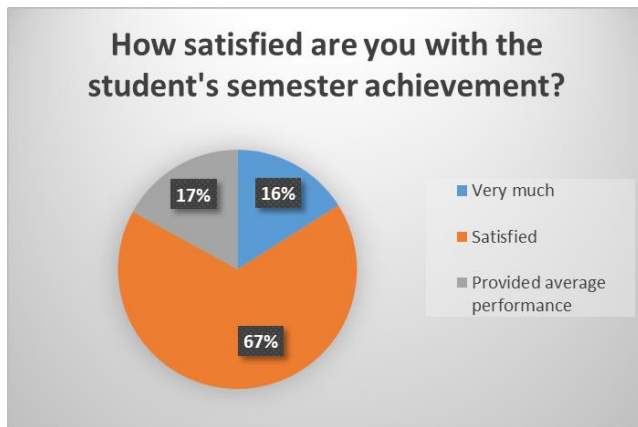
h) Do you think that the changes caused by the pandemic will change the strategic objectives of the training in the future?

i) Do you think that the changes caused by the pandemic will affect the professional content of the dual training?

7. Research results

42% of respondents were able to carry out tasks and tasks requiring independent work without difficulty before the epidemic, rising from 40% in 2020 to 44% in 2021. For practical type subjects, the institution encouraged independent task solving, students were given more individual tasks, the ability to learn independently was valued and had a positive impact on individual work performance. Due to the total restriction, students in dual training fulfilled their training obligations in digital form, it was decided on a company-specific basis which partner organisation required personal consultations and practical work. This was done according to the epidemiological protocol specific to the company. Among the students of the University of Dunaujváros participating in the dual training, there were no deferrals or backlogs of studies during the Covid situation.

Chart 1. How satisfied are you with the student's semester achievement? (2020)



Source: edited by the authors

Chart 2. How satisfied are you with the student's semester achievement? (2021)

Source: edited by the authors

Chart 3. The time of integration of the dual student in the given organization (2020)

Source: edited by the authors

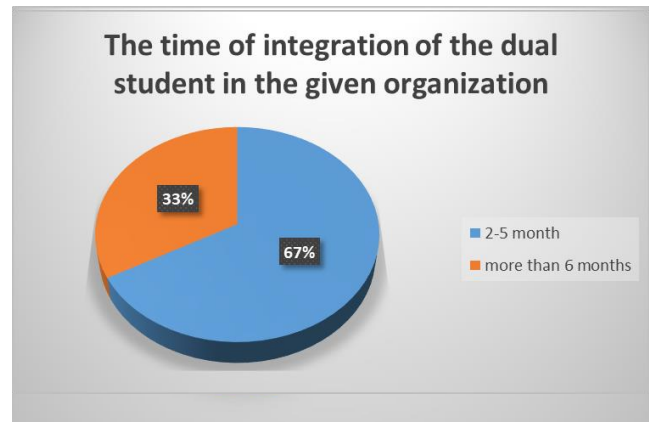
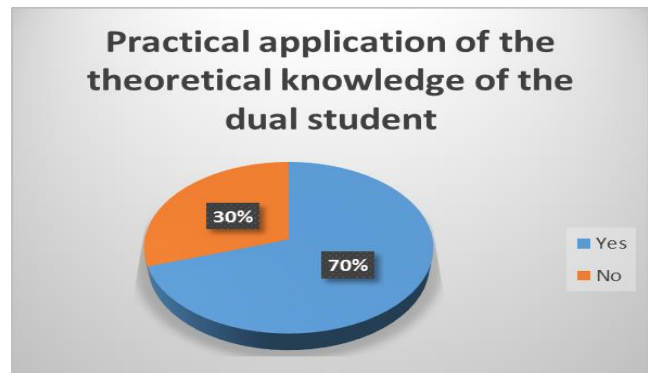
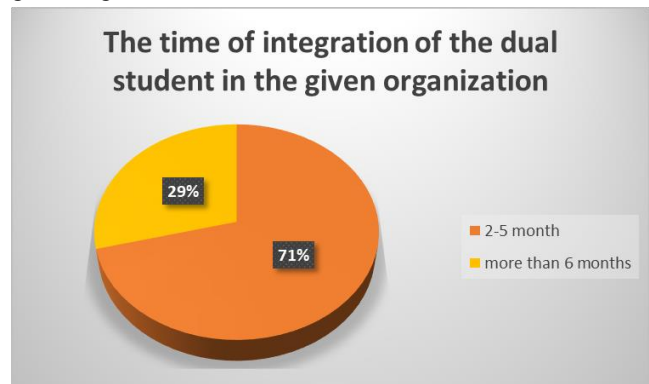


Chart 4. Practical application of the theoretical knowledge of the dual student (2020)



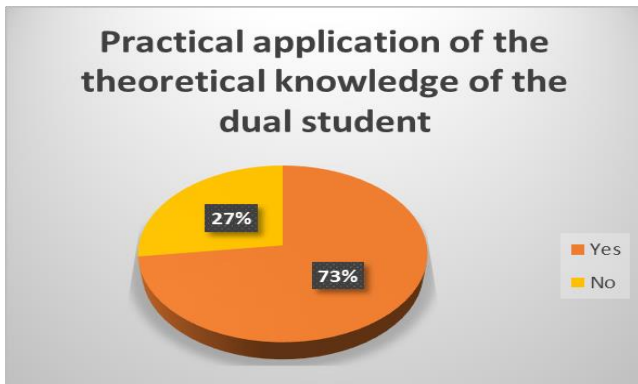
Source: edited by the authors

Chart 5. The time of integration of the dual student in the given organization (2021)



Source: edited by the authors

Chart 6. Practical application of the theoretical knowledge of the dual student (2021)



Source: edited by the authors

In distance learning, a number of solutions can be successfully applied, using different software, simulations, giving students creative tasks, full digital access to learning materials through the Moodle eLearning framework, creating a workshop environment in the digital space. Students were provided with explicitly practice-oriented and problem-solving training, which facilitated their professional development thanks to well-designed and structured curriculum development. In general, students' self-advocacy and communication skills have changed positively, the relationship between training places and trainers has been strengthened, and flexibility between partners and students has increased.

The main expectations of dual training as perceived by society:

- *flexibility, quality, short duration*
- *mapping global objectives to the local level:*
- *it seeks to meet local needs at local level*
- *reduces labour migration*
- *Combines academic knowledge and practical skills*
- *fulfils the industry's primary objective of providing a competitive supply of highly skilled workers*

Practical experience has shown that the relationship between companies and higher education is more intensive than in the case of traditional forms of training, but at the same time openness and inclusiveness on both sides is necessary to achieve the objectives set and to ensure successful operation. By getting to know the network of contacts and resources of the organisation/employer, the network of cooperating institutions, and by becoming part of the network, the student will have the opportunity to gain recognition and acceptance. The workload of students in dual training is at least twice the average workload of a traditional type of training. From the perspective of the

higher education institution, offering a dual training programme can increase the number of students. A student entering a dual programme can be prepared in the classroom and can present a higher professional standard through questions and comments, which can act as a pull factor for students. In general, dual cooperation broadens cooperation with the subject area and can also have a beneficial effect on its content. The following arguments are put forward by the theoretical training centre. The dual training programme is a training programme that requires a considerable amount of energy in addition to the familiarity and partnerships that are established. Effective implementation requires considerable coordination and continuous communication even after a student has joined the programme: support for the student, support for the institution, and not always a dedicated, free teaching capacity. According to the reports of the professionals who teach in engineering courses, the shortcomings and negative aspects of theoretical training are not always fully revealed in a different quality. It can lead to tensions among theoreticians, and may not necessarily lead contributors towards a solution in the absence of additional resources.

University

- Delivering high quality vocational and market-oriented training
- Increasing professional visibility and recognition
- Increase student numbers and enrolment
- Increase the range of educational and research partnerships

Students

- Selected by employers
- Long-term stable career opportunities
- Acquisition of skills that can be used in daily practice
- Self-paced but supervised learning

Companies

- Supply of skilled workers
- You get what/who you need
- Control the learning process
- Reduce the risk of employee churn

Chamber

- Alleviate skills shortages
- Implementing dual training for mechanical engineers in line with workers' needs
- Establishment of long-term training and continuing training cooperation

Typical aspects of the perception of dual training:

Some of the industrial partners in employment made the following statements: "... there is a huge gap between university education and practice, education has become too theoretical and workshop-oriented, which is also disadvantageous for domestic SMEs. The introduction of dual training is a partial solution to the problems identified in the new higher education strategy, but he believes that the German model without examining the social and economic relations and adapting them to the Hungarian specificities is not a good idea." Strengthening practice orientation is the most important aspect, based on the expectations of industrial partners and the labour market. In its current form, dual training does not give the SME sector the role that is in fact the main objective of the reform. In some of the models to be introduced, they will train a cheap, easily adaptable workforce for multinational companies, and thus the skills of graduates will be used mainly in operations. The decision-maker considers that: "... the students' knowledge is far from being limited, on the contrary, they will gain much greater insight and a broader knowledge of real business operations than in traditional training...". The curricula also focus mainly on the specialised areas of activity of large companies, where the knowledge is most useful. Industry - in order to develop, it needs professionals with a broad range of knowledge who can provide new information and skills.

Cornerstones for development:

- Study "good practices".
- Interviews with an external partner in the framework of the implementation
- Operation of an institution-specific concept
- Specification of a customer relationship management

Features of the training structure:

system (CRM) (marketing, communication)

- EFQM system business plan for the contractual process of corporate partnerships
- Assessment of the soft skill expectations of students on the labour market
- Training and development of students and trainers,
- Assessment of the labour market relevance of university courses

Internal environmental elements for effective implementation

- Organisational structure adapted to market conditions, transformation of linear functional organisation.
- Monitoring changes in the labour market and incorporating them into the management strategy
- Defining competences and responsibilities adapted to the changed tasks, and drawing up personalised job descriptions.
- Organisational development:
 - Defining the objectives to be achieved
 - Simple and standardised contracts
 - Open calls for tender
 - Identification of preferred research areas
 - Internal selection
 - Restructuring of highly fragmented organisational structures Preference for matrix-type operation
 - Description of "good practice"

Dual training complex knowledge material

| University | Joint Intersection | Partner | Dual Training Centre |
|---|---|---|--|
| Theoretical knowledge (known body of subject knowledge) | Company selection criteria Admission point value and point threshold | Practical knowledge (known body of subject knowledge) | Definition of Organisation and Operation Definition of tasks Laying down the principles of service provision |
| Research, computational procedures, modelling (methodological skills) | Qualification thesis and diploma results | Project-based work, problem research, analysis, synthesis (methodological skills) | Defining the organisation's network Organisation of tasks and responsibilities Definition of tasks relating to research, innovation development and quality assura |
| Self-awareness, leadership (social skills) | Workplace performance appraisal criteria and results | Motivation, delegation, evaluation, communication skills, cooperation (social | Definition of tasks of an administrative/organisational nature Specification of necessary staffing |

skills)

conditions

Setting the form and level of funding

8. Conclusion. Dual training - the importance of synergy in higher education institutions

The emergence of the coronavirus has led to the introduction of a number of restrictions worldwide, which have made it more difficult to conduct mainstream education and professional training, such as total closures and physical distance learning, with the consequent emergence of distance learning and its forced innovation and development. However, access to learning and skills development in some contexts has been maintained by the rapid shift to distance learning in technical, vocational and technical education and training, with pre-existing social and digital divides putting the most marginalised groups at risk of being left behind. With few exceptions, the increased use of online learning solutions in programmes has not facilitated the acquisition of practical skills and the organisation of work-based learning, which are essential ingredients for the success of dual training.

The situation is further colored by the energy crisis caused by the Russian-Ukrainian war, which forced several institutions, including the University of Dunaujváros, to switch to online education again in the winter months for the sake of sustainability. Unfortunately, the crisis did not spare the dual partner companies either.

The closure of partner firms and their declining profits have had an impact on employment, job prospects and reduced the expansion of apprenticeships in enterprises. The limited availability of viable distance learning platforms and educational resources, the specialisation of assessment and the drive to maintain the quality of training have made life difficult for students and trainers alike, and increased the likelihood of falling behind or even dropping out of education, combined with growing economic hardship.

In contrast, an online survey conducted by the International Labour Office, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Bank between 5 April and 15 May 2020 on the impact of the Covid-19 pandemic on dual training and skills development reported a number of positive practices that appear promising. These include the development of flexible learning and assessment opportunities. Public and private actors in dual training have immediately formed partnerships to increase the availability of accessible distance learning solutions, develop new training programmes and allocate additional resources to alleviate skills and labour shortages in sectors severely affected by

the health crisis. These joint efforts have resulted in innovative solutions in response to the pandemic. Higher education institutions will help to further develop opportunities to ensure better preparedness and rapid recovery.

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