

Quality Education and Digitalization Efforts, the Catalysts of Sustainable Development

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Education, science, technology, research and innovation are the supporting tools of the European Union's Sustainable Development 2030 program. They are valuable elements in themselves, the priority of which cannot be doubted, since they act as catalysts. What should be the direction to follow with the help of these factors in order to preserve competitiveness within the framework of sustainability? The solution is a factor affecting the lives of all of us. The world of business, education and this resent are trying to find a solution to this challenge. Sustainable development is a priority goal of the internal and external policies of the European Union, among the 17 Sustainable Development Goals (SDGs), the member states undertake to implement quality education and develop digital competence. The Erasmus+ education and training EU (European Union) programs help to overcome the differences between Member States and regions.

1. Introduction

We face challenges in our environment, the solution of which is a cross-border, joint task. In meeting the challenges, the formulation of sustainable development goals provides help by presenting sustainable practical examples, where the cooperation of representatives of different sectors is very necessary (Hatos, 2022). Joining the UN's (United Nations) intention to achieve sustainability, the need for immediate action was highlighted. The flexibility of implementation requires the appropriate training of young people and the acquisition of skills that make them suitable for successful employment (European Commission, 2016a).

Horizontal tools supporting the realization of a sustainable Europe include education, science, technology, research, innovation, and digitalization (Kövecsesné Gósi, 2020). Lifelong learning requires investment, as it is one of the fundamental tools of sustainable development; in the absence of continuous training, the goals cannot be achieved (Rajcsányi-Molnár et al., 2013). ICT (Information and Communication Technologies) skills, digital competencies, and the conscious use of artificial intelligence represent a huge potential for maintaining competitiveness worldwide (Koncso Szombathelyi et al., 2016)

Research and development investment expenditures are long-term investments, and it is important to recognize their importance. Examining all research and development expenditures in the period between 2000-2020 in terms of GDP %: in 2000 Hungary invested 0.8 %, China 0.9 %, the European Union 1.8 %, South Korea 2.2 %, the United States 2.8 %, Japan 2.9 %, until 2017 Hungary invested 1.32 %, China 2.1 %, the EU27 2.15 %, South Korea 4.6 %, the United States 2.8 %, Japan 3.2 %. For 2020, the EU27 target value was 3 %, a realization of 2.32 %. Hungary's target value was 1.8 %, realization of 1.62 %. In order to accelerate sustainability, these expenses need to be increased (KSH, 2021).

The aim of the study is to present the digital competence development results of the Erasmus+DUDEN project, which is a manifestation of the organizations' work in quality education. The work methodologically reviews the conditions necessary for quality education and presents the Erasmus+ and Erasmus+DUDEN projects. The Erasmus+ program data comes from the reports of the EU and the Tempus Public Foundation. The data was analyzed in order to establish statistical data on the use of digital tools in education. The statistical analysis of tenders and public investments helped establish the correlations between the EU's efforts and people's reaction.

2. Quality education

The target set in the Europe 2020 strategy for those with a higher education qualification was 40 %. In 2022, this rate in Hungary is 31.9 % (KSH, 2023).

According to 2017 surveys, 57 % of EU residents aged 16-64 had basic digital skills (European Commission, 2019). Regarding the population aged 16-74, in 2019 31 % in Hungary and 28 % in the EU had low-level digital skills, 23 % in Hungary and 25 % in the EU28 had average-level digital skills, and 25 % in Hungary and 33 % in the EU28 had above-average digital skills. Based on the indicators, it is necessary to achieve the highest rate of development in the area of above-average digital skills in Hungary, specifically for the sake of research and innovation (KSH, 2022a).

Regarding adult learning, the EU27 target value for the 25-64 age group is 15 %. In 2017, the result was 10.9 %. In 2020, 10 % of women and 8.3 % of men in the EU27. In Hungary, 5.75 % of women and 4.4 % of men were affected (KSH, 2022b).

There is an improvement in foreign language skills. In 2007, 42 % of the population aged 25-64 knew a foreign language. In 2016, 35.5 % knew one, 20.9 % two, and 8.3 % three or more foreign languages (Sustainable Development Goals (SDG) (KSH, 2022c). However, the proportion of students with poor reading skills increased regrettably. In 2018, it reached of 25.3 %, and the EU27 also showed a value of 22.5 %. The 15 % target value for 2020 was not reached by the PISA (Programme for International Student Assessment) combined reading comprehension results, ranking 20th place among the EU member states (KSH, 2022d).

The effectiveness of the region is coherent with the use of social connections and international-level skills. The basic factor of long-term growth is technological innovation, acquisition, and accumulation of knowledge (Braun et al., 2021). The EU formulated policy goals at the Union level, Member State level, regional level, and corporate and civil society level. In order to be effective, an important principle is coherence between the member states, taking impact assessments into account (Toledo-Vazquez et al., 2022). Priority EU programs, including the New European Skills Development Program, the Youth Strategy 2019-2027, and the Digital Education Action Plan (European Commission, 2019), provide assistance in the development.

2.1 Erasmus+

The EU has invested in many programs to achieve the promotion of competencies and skills. Erasmus+ is the European Union's program supporting education, training, youth affairs, and sports. Applications can be submitted by institutions, and individual participation can be realized through them. One of the main objectives of the Erasmus+ program in the field of education is the realization of the European Education Area by 2025. The available grant amount is 28 billion EUR (Tempus Public Foundation, 2023).

Erasmus+ programs, suitable for the local realization of programs that encourage the creation of connections between regions and internationalization, create an opportunity for students, teachers, trainers, and applicants to increase their competencies that also meet the expectations of the new type of workplace, and to expand their digital and foreign language skills. Mobility programs offer an excellent chance to gain experience in other countries, to get to know the culture of other countries and to establish personal contact with the students and colleagues participating in the international program. The new impulses and tender results can become part of the daily practice of the given institutions, through which the quality and effectiveness of the work of the participating institutions can be increased (European Commission, 2017).

Within the Erasmus+ program, it is possible to implement higher education, public education, vocational training, youth, adult learning, sports, mobility, partnership, and strategic projects. Learning takes place during the mobility projects. The rest of the project consists of the preparation, practical application, sharing, and distribution of the products. The central activity of the partnership programs is the implementation of cooperation and project work. Applications can be submitted by institutions and organizations, partner work is supported by national offices. In the case of Hungary, this agency is Tempus Közalapítvány (Tempus Public Foundation) (Tempus Public Foundation, 2021).

The reason for the selection of the areas to be examined is that education, various trainings, and digitalization play an outstanding role in creating jobs and increasing competitiveness. Therefore, the examination and promotion of this extremely popular application of the European Union greatly serves the competitiveness of the individual and the community.

2.2 Erasmus+DUDEN

A concrete personal example is the Erasmus+ DUDEN (Digitale Unterrichtsmaterialien für Digital European Natives/ Digital teaching materials for Digital European Natives) application of the Erasmus+ KA2 (Erasmus+ Key Action 2) preschool and school partnerships subprogram, in which vocational training institutions from Germany (Essen), Hungary (Győr), Romania (Székelyudvarhely) and Austria (Vienna) cooperated. The aim of the two-year project, which ended in 2022, was to learn from each other, share results, and develop the

competencies of the participants. The project provided the opportunity for four teacher-student partnership meetings, which could only take place online due to the pandemic situation (Kaszalik, 2021).

The continuation of the program, Erasmus+ DUDEN2, was started again in 2023 in cooperation between three countries, Germany (Essen), Hungary (Győr), and Romania (Székelyudvarhely). During the 18-month duration of the small-scale partnerships program, three teacher-student meetings and project weeks with additional teacher training will be implemented. The project goal is the development of German digital teaching materials from professional (commercial, logistics) and general knowledge subjects, practical testing and evaluation of the teaching materials with the students, familiarization of the teachers participating in further training with new websites and applications, sharing and putting the new teaching materials into practice. The results will be uploaded to the eTwinning interface for general availability. The participants receive a Europass mobility certificate, which records their professional experience and skills acquired during the project weeks. The language skills development and professional development of the students and teachers participating in the Erasmus+ winning tenders that have been going on for years are guaranteed, and there is an opportunity to build a network of contacts and gain cultural experience during the trips, which are excellent for developing self-knowledge and gaining practical experience (Lakos, 2023).

3. Results

The priority of developing digital competence in the implementation of quality education is supported by many arguments. The development of communication and foreign language skills is also associated with digital competence among the eight competencies specified in the lifelong learning reference framework (European Parliament, 2006). Only competitive knowledge can form the basis of the knowledge-based economy, the achievement of which requires competency development focused on practical application. The development of critical thinking, communication competencies, and expressions is essential.

DIGCOMP (European Digital Competence Framework for Citizens) mentions information collection, data processing, communication and collaboration, digital content creation, security, and problem-solving among the areas in need of renewal. These areas help align education and labor market needs; their implementation can only be achieved through the connection of education, training, industrial players, and social partners (European Commission, 2016b)

Erasmus+ is also an opportunity to strengthen this network of contacts, for which successful applications for the 2014-2020 Hungarian vocational training applications came primarily from educational institutions. Most of the successful tenders in this area were realized in Central Hungary, with a strong territorial concentration in the capital city. In terms of the countryside, the tender seats are regional centers, county seats, and, with special justification, small settlements (Figure 1).

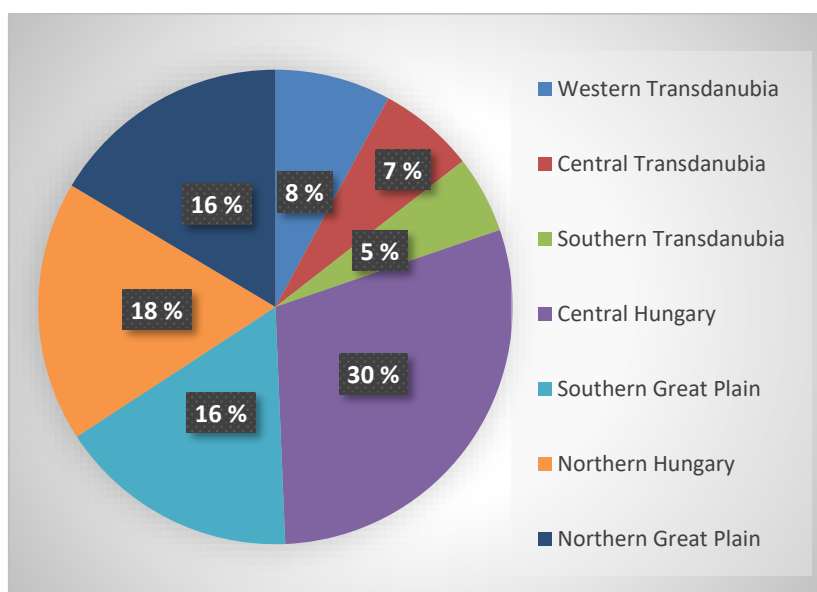


Figure 1: Erasmus+ supported vocational training applications by region. Source: (author's construction based on Tempus Public Foundation (2022a))

There is an asymmetry in the economic background between the application sites, as capital goods prefer knowledge-based regions with competitive advantages when choosing their locations. Based on this principle, the peripheral areas are at a further disadvantage, so reducing inequalities becomes a priority task of the state since the geographical situation has a strong influence on the evolution of territorial development (Rechnitzer and Smahó, 2011). The Erasmus+ application resources of the European Union also serve to create equal opportunities (Figure 2).

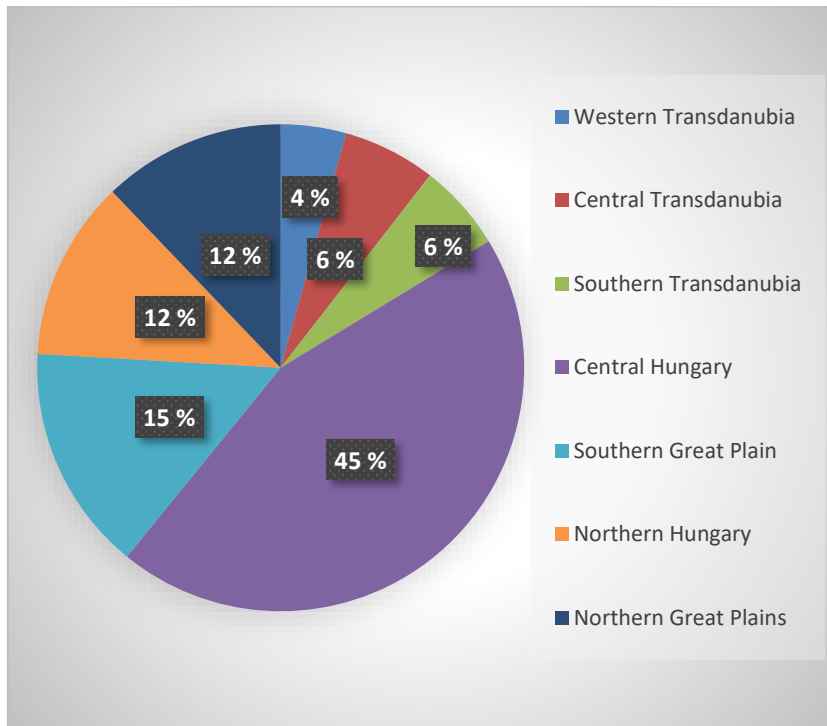


Figure 2: Erasmus+ supported applications in the fields of public education, vocational training, higher education and adult learning 2014-2020. Source: (author's construction based on Tempus Public Foundation (2022b))

The increase in the Hungarian grant amount for Erasmus+ education, which helps to reduce regional inequalities, parallels the tendentious increase in the number of applications. The most popular elements of the introductory phase of the 2014-2020 application cycle were catering and technical/mechanical engineering, while lifelong learning, cooperation, innovation, language learning, and the development of digital competence led the popularity list of the final phase. Erasmus+'s collection of methodological tasks, the Tempus Public Foundation's Digital Methodology Library, shares with readers the results of collaborations that have already been implemented. More than 1,000 new practices with methods and innovative elements found in the Knowledge Library are available to everyone.

The watchwords for the period 2021-2027 are more inclusive, more digital, and greener, complementing the objectives of achieving sustainability and equal opportunities. Digital goals are supported in the field of learning and employment by the DigComp digital framework that presents eight skill levels (Carretero Gomez et al., 2017), the Digital Competence Framework based on the DigComp 2.1 system (Government of Hungary, 2019), and DIMOP (Digital Agenda for Europe Operational Programme) Plus 3.0. 2021-2027 (Government of Hungary, 2021). The critical use of digital technologies and the management of disinformation can only be solved by strengthening skills, at the moment the lack of digital experts is critical, even in the field of cyber security and data management. In the European Union in 2021, 9 million people worked as ICT experts, while the goal set for 2030 is the training of 20 million ICT experts, 10 % of the total EU employment (European Commission, 2022a) (Figure 3).

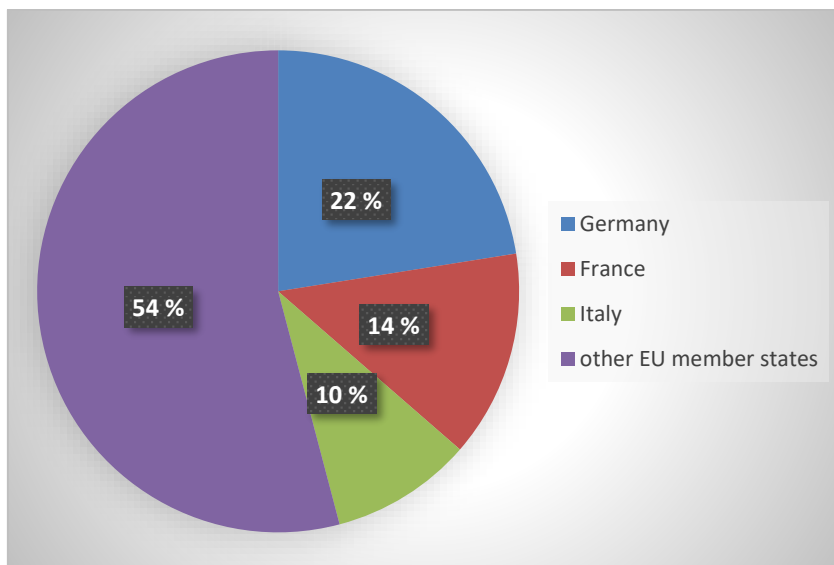


Figure 3: Proportion of ICT professionals in the European Union, 2021. Source: (author's construction based on European Commission (2022a))

The DESI (Digital Economy and Society Index) ranking showing the development of the digital economy and society in 2022, Hungary is ranked 22nd among the 27 EU member states. It must achieve significant progress in points proposed by the European Parliament and the Council, such as human capital, Internet access, the integration of digital technologies and the field of digital public services (European Commission, 2022b). Some signs of convergence are already visible in the EU, but the differences between member states are still large. To reduce them, every opportunity must be seized, collaborations and knowledge sharing efforts are important, the primary arenas of which are educational institutions, treating curriculum development as a starting point.

4. Conclusions

The goal of inclusive, fair and quality education is to guarantee access to education and improve living standards, which is a vital element of the EU's development agenda established for the period up to 2030. Unfortunately, despite the brevity of time and the high importance of the task, the rate of progress is not adequate. Further increased action is needed: international cooperation, education policy measures, regulations, incentive and motivational elements, and sustainable, predictable planning in the form of commitments. Special attention should be paid to the breakaway regions.

Hungary faces particularly big challenges, as the efforts made so far are not sufficient. There is a lack of appropriate infrastructural developments, modernization of the area, methodological development, and efficiency. The conditions for quality education include the provision of qualified teachers and appropriate school equipment, as well as the implementation of digitalisation efforts. The European Union's Erasmus+ program also helps lagging regions catch up, which, in addition to creating equal opportunities, also supports digitalization, the green transition, and the implementation of sustainability. By publishing the results, the institutions should be motivated to participate in the tender program in the largest possible number since the total amount has doubled from the previous program, and the participants can count on a guaranteed increase in their value on the labor market and enjoy the stimulating opportunity of lifelong learning.

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