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Digital Higher Education and Adult Education in Greece and Other Balkan Countries

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Abstract

Digital innovation has paved the way for new educational opportunities and enhanced lifelong learning in Greece and other Balkan countries, aiming to bolster digital literacy and competencies. There is a discrepancy between developed countries, which seamlessly integrate technological advancements, and developing countries, which face unique challenges. This article examines the state-of-the-art in higher digital education and adult continuing education in Greece and the Balkans, identifying key factors contributing to digital gaps and suggesting strategies for successful digital transformations. Significant progress has been made through EU-funded programs and national initiatives like the Digital Transformation Strategy and the National Digital Policy in Greece. It has enhanced digital literacy and online education in the country. Nevertheless, there are still challenges such as insufficient lifelong learning strategies and digital skills development. Other Balkan countries, on the other hand, face similar issues, with varying degrees of success in adopting digital technologies. This review underlines the need for comprehensive, inclusive policies and investments to bridge digital divides and ensure sustainable digital education across the Balkans.

Keywords: *Digital transformation; higher education; Greece; Balkans*

Introduction

Digital innovation has provided access to new educational opportunities and ICT-enhanced lifelong learning pathways, aiming to strengthen digital literacy and improve digital competencies among countries. The utilization of technologies in education is creating new challenges in learning and opportunities for further enhancement of knowledge society. Fast speed internet, high-performance digital devices, and machine learning processes are generating a vacuum of human capital skills to be acquired. While developed countries adapt the technological advancement regularly, fill the required skills gap, and open the doors of new resources, the case of less developed countries is very much different. This report presents the state-of-the-art of higher digital education and adult continuing education in Greece and other less digitally advanced Balkan countries. It is aimed to facilitate the identification of important factors that have contributed to those observed digital gaps in human capital and offer suggestions for more successful digital transformations in higher education and adults learning systems.

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Higher digital education and adult continuing education in Greece: Overall assessment

Greece's state schools and universities experienced an unprecedented growth and 'opening up' in late 1990s and early 2000s, under the umbrella of the Operational Programmes for Education and Initial Vocational Training (OPEIVT) I and II, financed by the EU as part of the general cohesion policy among the EU member countries. Particularly, OPEIVT II is considered to be the most significant –in terms of scope, special targets, and volume of available resources– mechanism of educational restructuring in Greece (Kyriazis and Asderaki, 2008). From 1998 till 2006, there was an increase of 24% in new higher education departments in Greece. A new Framework followed, the National Strategic Reference Framework for the period 2007-2013 which set a wider strategic plan for the development of human resources in Greece and the promotion of lifelong learning rather than the improvement of basic infrastructure and needs of formal education, on which the two preceding OPEIVT programmes focused (Gouvias, 2011; EC/EACEA/Eurydice, 2023a).

The Greek Government initiated several actions (National Digital Policy 2016–21) to enhance digital literacy at all educational levels, focusing primarily on the primary and secondary education (Megalou and Kaklamanis, 2014). Open academic courses have been initiated by the Hellenic Ministry of Education since 2012, with the intention of making the Greek universities digitally more competent. For example, Merakis (2019) reports that online courses exceeded 4,000 lectures in 2019, offered via the "National Portal of Open Academic Courses" and technically supported by the Academic Internet GUnet (http://project.opencourses.gr/). A successful example in this respect is the Hellenic Open University that provides distance learning since 1997, addressing the gap in digital competences among working adults, and disadvantaged social groups, including the unemployed and senior citizens (Drigas et al., 2019). The government also introduced in 2015 an open e-textbooks platform known as Kallipos Open Academic e-Textbooks, which continues to cover the need for an open source platform of online academic textbooks.

Major initiatives that are being implemented nowadays is the 2020-25 Digital Transformation Strategy (also known as the 'Bible of Digital Transformation') which sets priorities for the digital transformation of the country, as well as goals to develop the digital skills of Greek society at all levels and ages, with the purpose of creating 'Digital Greece.' Among the key objectives of this Strategy is the expansion and development of open digital educational content and distance learning platforms. For example, several digital structures to support modern and asynchronous distance learning have been developed such as the collaborative Digital Educational Platform e-me, the Digital School portal, the Interactive Textbooks Digital Library, the Photodentro OER Learning Content, the Digital Teaching Scenarios Platform 'Aisopos', the Universal Design and Development of Accessible Digital Educational Material, the Learning at Home website, and the Panhellenic School Network-Teleconferences. Additionally, the National Recovery and Resilience Plan 'Greece 2.0' promotes the integration of Technology and Science within STEM (Science, Technology, Engineering and Mathematics) programmes in the Centres for Creative Employment to support the enhancement of children and adolescent digital skills (UNESCO, 2023). Another noteworthy action is the legal framework adopted in 2022 to stipulate that every Greek higher education institution should establish a learning and teaching support centre to enable digital competences (EC/EACEA/Eurydice, 2024).

In Greece, like in other countries, Covid-19 expanded and accelerated the digital transformation of higher education, which nonetheless encountered implementation and access obstacles. In many cases, the pandemic enforced utilization of educational technologies among students and, particularly, educators that were resistant to such changes in the pre-pandemic period (Nikolopoulou, 2022). This enforced digitalisation worked as an enabler for educators and students to understand the benefits and flexibility of the new pedagogical practices which was a great opportunity for Greece to move forward with an enhanced digital transformation of university education (Savić and Alčaković, 2022; Mohamed Hashim et al., 2022; Zancajo et al., 2022). Interestingly, a survey on the preparedness of the educational system to switch to remote learning conducted by Bertelsmann Stiftung in 2021, for OECD and EU countries, placed Greece on the 6th rank, from the 22nd in a previous ranking.

Greece also participates in a wide spectrum of European initiatives and programmes such as the Research and Innovation funding program Horizon 2020 (for instance, GLASS project) that contribute to the country's digital transformation including education. Conversion courses on reskilling and upskilling in digital studies and advanced technologies are being developed and targeting at university graduates. Other digital services for higher education students and teachers include: ATLAS a centralised online service to interconnect companies offering internship positions with all academic institutions in Greece; a project to interconnect the information systems of the higher education institutions Career Offices and of the Hellenic Authority for Higher Education to facilitate information and good practices exchange. (EC/DESI, 2022). Greece has also moved to regulatory changes to boost learning and teaching innovation and enhance higher education pedagogy (EC, 2024).

Overall, while Greece has made remarkable and tangible progress in digitalising its higher education system over the past years, it still needs to address significant gaps in certain dimensions, such as the lifelong learning strategy, digital skills, in particular ICT specialists and infrastructure in high-capacity networks and research centres to ensure the economy benefits from a digitally skilled population, unlimited connectivity, and broader collaborations (EC, 2023a).

Challenges of digital technology in higher education and lifelong learning: The case of Greece

The digital performance of Greece in higher education and lifelong learning involves various aspects including digital competences, the impact of digital technology on learning performance, and the implementation of lifelong learning policies. These aspects are addressed by a number of recent studies that can be found in the literature and highlight the state-of-the-art in this area.

A survey study conducted by Martzoukou et al. (2020) reveals that Greek higher education strategies have not fully embraced digital competences as a core literacy, impacting students' self-perceived digital competences for both learning and everyday life activities. The survey covered Library and Information Science students from three higher education institutions in Scotland, Ireland, and Greece. It was based on a self-assessment of the technical and higher-level digital competences of students, in particular e-leisure, e-learning, e-democracy, e-government, and e-health activities. The survey critically enabled students to assess digital competences from their perspectives as digital participants. Overall, it was found that students' digital competences are positively correlated with the previous everyday life digital

experiences. The higher the self-perceived digital competence levels of students were in everyday life digital tasks, the more likely they were to also develop high self- perceived digital competence in other digital areas related to their education.

The inclusion of students with special educational needs in higher education in Greece has been supported by digital technologies, although further improvements in curriculum adjustments and teacher training are necessary. In this respect, Riga et al. (2020) performed a systematic review to find out the extent to which Greek universities have developed and implemented digitally assisted services to meet the needs of students with learning disabilities within the scope of a broader inclusive education. While the results showed that this endeavour has been broadly implemented, more adjustments are suggested to meet all European priorities set by article 24 of the Convention on the Rights of Inclusion of Persons with Special Educational Needs and/or Disabilities. More emphatically, the progress was considered insufficient in relation to the curriculum and teachers' professional training to ensure all students' inclusion. There are still more to be done so as to achieve full equal terms and conditions in Higher Education in Greece, given that the reality of university life for the students with disabilities is characterized by continuous exclusion from the learning procedures mainly due to the actual barriers to learning (Vlachou and Papapanou, 2018).

Students' mobile phone practices for educational purposes has been examined by Nikolopoulou (2022) using survey data from a sample of students at a public university in Northern Greece in the post-pandemic era. The results revealed that the increasing utilization of mobile phones for educational purposes may advance the digitalization process of Greek universities in combination with other factors such as educators' practices and university policy. Apart from the advantages of using mobile phones in education (quick searches for information, immediate access to e-classes, flexibility in accessing information/material anywhere/anytime, portability, easy communication with peers/tutors, familiarization with digital tools, and interest for academic subjects), the study identified disadvantages/obstacles as well, related to internet connectivity, unreliable sources of information, limitations of the devices (e.g., small screen size, compatibility), and distractions.

Aleksić and Politis (2023) performed a comparative study of 397 students from two state universities in Greece and Serbia to examine the impact of digital technology exposure on the learning performance of undergraduate students. The focus was on the population of older adolescents and young adults in their early 20s (the so-called Generation Z, i.e. the first generation born in the Internet era). The results indicated that although Greek and Serbian students have different digital technology preferences, the learning performance and academic success impact was similar between the two countries. These results enable a deeper understanding of the extremely complex relationships between the digital social environment, students' preferences and habits, and learning performance factors that are specific for the field of computer graphics and simulations.

Following national educational reforms in alignment with EU policies, the Greek government accelerated, after 1996, the implementation of lifelong learning in higher education. This development has led to new curricula and significant changes in the structure and delivery of education, emphasizing learner needs and market demands (Kokosalakis, 2001). Distance education and e-learning were enabled through investments in ICT infrastructure implemented by the universities and financed mostly by EU funds. This strategy motivated many institutions to become involved, leading to a marketization of education with some

unpleasant consequences (Gouvias, 2011). One of the oldest open system institutions providing distance learning in Greece has been the Hellenic Open University, created in 1997, that still provides online distance undergraduate, postgraduate education and, lifelong learning. Today, centres of vocational training, continuing education, and lifelong learning exist in most higher education institutions of Greece, implemented by all methods: e-learning, class courses, and hybrid learning. Numerous programs are addressing graduates of various ages who wish to specialise or upgrade their knowledge and skills (see notable examples https://diaviou.aueb.gr/, www.cce.uoa.gr, https://kedivim.auth.gr/en/programs/, https://e-learning.ntua.gr/).

On a related note, UNICEF's Akelius Digital Language Learning Course uses mobile phones, tablets and computers to support language learning among refugees, migrants, and linguistic minorities through a blended learning approach. This course was first introduced in Greece in 2017 and, as of 2022, had been implemented in 10 countries, including Bosnia and Herzegovina, Italy, Lebanon, Mauritania, and Serbia. Evidence from Greece revealed that the course improved students' Greek writing and speaking skills and encouraged student attendance (Karamperidou et al., 2020; UNESCO 2023).

Challenges of digital technology in higher education and lifelong learning: Examples from Balkan countries

Higher educational institutions in Balkan countries have been actively engaged in adopting modern digital technologies and develop lifelong learning educational programs, driven by various regional and European Union initiatives. This analysis highlights the current trends, challenges, and developments in digital education across several Balkan countries.

A comparative study on the use of virtual reality (VR) and augmented reality (AR) technologies in the region of Western Balkans was conducted by Kamińska et al. (2022). It was found that, while Universities in Albania, Kosovo, and North Macedonia are increasingly incorporating these technologies to enhance experiential learning, the awareness and adoption among academic staff and students varies substantially, creating obstacles and reducing the effectiveness of such innovative technologies.

In Serbia, it was found that differences in access to technology and digital literacy skills between students and educators impact the effectiveness of digital learning (Radovanović et al., 2015). This evidence was based on international indicators, secondary statistical sources, and primary semi-structured interviews with students and teachers in higher education. Communication gaps and collaboration issues between professors and students were identified as a result of institutional problems of stratification and broader socio-economic disparities. It has also been suggested that digital literacy courses in higher education curricula is of paramount importance in preparing Serbian students for the digital labour market and fostering a high degree of digital skills (Markovic et al., 2017). In this regard, several initiatives have been implemented since 2013 by the Serbian Ministry of Education, Science, and Technological Development to fight digital literacy in the Serbian education system. These include the 'Digital School' project, the 'KODigranje' campaign as well as the 'Digital Youthquake' project to increase the digital literacy of young students and workers. Moreover, Serbian laws on education are advocating for an increased level of utilization of modern ICT in teaching.

In Croatia, a study was conducted by Müller and Aleksa Varga (2019) to assess the digital competences among teachers and associates working in higher education institutions using an online questionnaire and a representative sample of 1800 teachers and associates at higher education institutions, working in different departments in Osijek, Split, and Zagreb. The results indicated large disparities in digital competences between educators of technical sciences and those working in the field of social sciences. The survey responses also showed that 70% of teachers and associates consider themselves as being digitally competent in the use of computers and new technologies, while over 60% of them regularly use media in their teaching practice. The authors conclude that the Croatian education system needs to incorporate an integrated Multimedia Training and E-Learning Programme in higher education curricula to increase the digital competences of faculty and students in Croatia.

The digital transformation of Kosovo's education system, from pre-university to university level, has largely been enforced under the pandemic pressure. Qorraj and Kaçaniku (2022) studied the case of Kosovo as an example of a Western Balkan country facing fundamental transition challenges such as institutional building, limited administrative capabilities, organisation culture, teaching practices, and other challenges regarding the educational process and digitalization. The above study used a qualitative research design focusing on teacher education as a pathway that links pre-university education with higher education system to ensure future teacher preparation. The results highlighted the need for comprehensive digital strategies in teacher education to ensure a sustainable digital transition.

As regards lifelong learning competencies, the European Union's policies on lifelong learning significantly influence Balkan countries. The integration of lifelong learning into the national education strategies aims to improve employment and competitiveness. competitiveness (Gaebel et al., 2021; Qureshi et al., 2021). EU Balkan countries are addressing these goals with varying degrees of success, focusing on digital skills and higher education enrolment. For example, Seyhan (2023) evaluated the performance of EU countries with the CRITIC-based Gray relational analysis method. The evaluation was based on education, technology and employment data, especially for university level and new graduates, unemployed young people and others who play an active role in the digitalization process. The performance criteria showed that the best performing EU countries in the Balkan region were Greece which ranked 12th among all 26 EU countries and Romania that ranked 16th. The other Balkan countries in the EU: Bulgaria, Croatia, and Slovenia ranked last in this evaluation (20th, 25th, and 24th position respectively).

Future Trends and opportunities of digital technology in higher education

The latest reports released by the European Commission on the digital performance of each EU member country identified a number of areas where the 27 member countries should improve in order to achieve the EU's digital decade targets (EC, 2022; EC, 2023a and b). Some common areas highlighted for Greece and the other Balkan EU countries which are more associated with the digital transformation in higher education can be summarised below:

- Digital skills: Further development by adapting higher education curricula to the latest digital needs.
- More effective and efficient development, implementation, and evaluation of digital education policies.

- Connectivity: Further investment in gigabit connectivity, especially in rural areas.
- Digitalisation of public services: Further expansion and quality enhancement.
- Collaboration reinforcement with the industry.

Improvement in the above areas will accelerate the digital transformation in education in the future and opens up new opportunities for digital and economic development (EC, 2023a; EC/EACEA/Eurydice 2024). Greece as well as all other Balkan countries, with the exception of Slovenia, are ranked among the last positions in the digital evaluations. For instance, the position of Greece in the 2022 Digital Society and Economy Index (DESI), which is a composite index measuring EU-members' digital performance, is low relative to the EU average (25th of 27 members), with Bulgaria and Romania in the last positions and Croatia in the 21st position. Slovenia ranked 11th (above the EU average) and is the best performing country among the Balkans in the DESI evaluations (EC DESI, 2022; EC, 2023a).

Nonetheless, overall Greece progressed well in recent years as it moved up by one position since 2019. When comparing sub-components, Greece has a much higher position in human capital (22nd of 27) in the DESI rankings. With 52.48% of people (age 16-74) having at least basic digital skills, Greece is very close to the EU average (54%), while in the younger group age of 16-24 years, Greece is among the frontrunners with 88% of young people with at least basic digital skills, much higher than the EU average (71%). The percentage of ICT specialists slightly progressed but remains low (2.8 %) compared to the EU average (4.5%). However, the proportion of Greek women ICT specialists (21%) is above the EU average (19%) (EC DESI, 2022; EC, 2023a).

The Global Education Monitoring (GEM) of 2023 by UNESCO, sourcing data from Eurostat, reports that, in 2021, the share of 16-74 year-olds with at least basic digital skills in Croatia reached 63.37, down to 49.67% in Slovenia, 47.21% in Montenegro, 41.3% in Serbia, 34.6% in Bosnia and North Macedonia, 31.18% in Bulgaria and less than 30% in Romania and Albania. Also, the share of adults in Europe that reported obtaining IT skills through informal learning was 21.84% in Greece and even lower in Romania, Bulgaria, and Croatia (UNESCO, 2023).

From a different perspective, the latest data from the EU Labour Force Survey (EC, 2023d) indicate a remarkable growth of the proportion of tertiary-educated (having completed a short-cycle tertiary, bachelor, master, doctoral or equivalent level of education) 25-34-year-olds in Greece over the last two decades This proportion now stands at 45,2%, well above the EU average of 42.0% and other Balkan countries (35.5% in Croatia and 24.9% in Romania). Yet, when looking at all formal learning and non-formal learning in the 4 weeks before respondents took part in the EU Labour Force Survey, the EU-average of participation of 25-64-year-olds stood only at 11.9% in 2022, while being negligible in Bulgaria (1.4%), Greece (3.5%), and Croatia (4.4%) (EC, 2023c).

The above statistics highlight the digital divide that continues to characterise some country groups within the EU27. Many efforts and co-ordinated policies are required by the Balkan countries to step up in the digital challenges they face, in particular under the newest digital

technological innovations of Industry 4 (merging Robotics, the Internet of Things, and the Internet of Services). More emphatically, the data indicate that the education structure still has a gap of skills and literacy about the usability of modern technology which should be deeply integrated in the learning process of the higher education institutions (EC, 2024; OECD, 2023).

Conclusions

The previous analysis indicates that Greece and the other Balkan countries have made significant strides in integrating digital technologies in higher education and lifelong learning, influenced by EU policies and national reforms. However, challenges remain in fully embracing digital competences and ensuring inclusive education for all students. The research results from the reviewed studies suggest that the educational strategy should adopt an holistic way of developing students' digital competences, integrating the ICT technological advancements and infrastructure with the demands in digital skills and expertise to meet the changing labour market needs and close job-mismatches in an increasingly digitalised world.

From a comparative viewpoint, Greece has achieved a higher ranking among the Balkans in most digital indicators compiled by international institutions (EC, UNESCO, OECD). Some Western Balkan countries are facing stronger challenges in digital education such as digital divides and varying levels of policy implementation. This suggests that more effective, inclusive, and path-breaking measures are needed from both political and educational authorities to successfully integrate advanced digital tools and bridge existing digital inequalities in this region.

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