



Country Report

Mapping the digital readiness and resilience of HEIs in response
to the COVID-19 crisis in Bulgaria in the context of:

Governance and enabling services

Teaching and learning practices and infrastructure

Literature review and field research

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TABLE OF CONTENTS

Table of Contents

1. Executive Summary	2
2. Pre-Covid-19 Status Quo of digitalisation of HE/VET/LLL in Bulgaria	4
2.1. Policy and practice (national/federal, regional, local)	5
2.2. Drivers and motivators	6
2.3. Barriers and obstacles	6
3. During/Post-Covid-19 Status Quo of digitalisation of HE/VET/LLL in Bulgaria	7
3.1. Policy and practice (national/federal, regional, local)	9
3.2. Drivers and motivators	11
3.3. Barriers and obstacles	11
4. Future Outlook and Opportunities	14
5. Conclusion	17
6. References	18

1. Executive Summary

This report aims to inform the actors on the current state of affairs when it comes to digitalisation of higher education in Bulgaria. The report is part of the series detailing the developments in the DigiTransformEdu project partner countries i.e., Bulgaria, Germany, Croatia, Italy as well as developments in the EU in general. The project “Digital Transformation of Higher Education and Training: DigiTransformEdu” (<https://www.digitransformededu.com/>) is a 26-month Erasmus+ project (2021-2023) that aims to foster the digital transformation of educational and training institutions by mapping their digital readiness and resilience in response to the COVID-19 pandemic among other objectives. The project is centred on the transformation to digital/online education that is defined as a distance form of education, in which digital tools and information and communication technologies are used to enable teaching, learning, assessment, certification, and the organisation of the educational process while learners, teachers, and administrators might be located in different places and the process might be either synchronous or asynchronous in time.

The DigiTransformEdu project explores the digital transformation in the educational systems above level 5 (from 5 to 8) in accordance with the International Standard Classification of Education (ISCED). In addition to review of literature, the research “Mapping the digital readiness and resilience of educational and training institutions in response to the COVID-19 crisis” surveys Higher Education Institutions (HEIs), Vocational Education and Training (VET) centres and Lifelong Learning (LLL) organisations. The research considers two dimensions of the digital transformation in the tertiary education:

- Governance and enabling services (referred as digital strategy and administration)
- Teaching and learning practices and infrastructure (referred as digital pedagogy)

and three target groups of respondents:

- Management and administration roles in an organisation
- Pedagogical staff
- Students/learners

To study the situation in Bulgaria, available research publications, national strategic documents, reports, studies, and articles that deal with the digitalisation of education were reviewed. In addition, nine HE, VET, and LLL institutions were directly or indirectly surveyed to provide further insight into the impact of the pandemic upon the digitalisation of education. Representatives from New Bulgarian University, Pedagogical College – Pleven, ESI-CEE, and Academy Nikola Tesla were directly interviewed and/or answered the online questionnaires while views of representatives from the other institutions (i.e., D. A. Tsenov Academy of Economics, American University in Bulgaria, University of Forestry, "Angel Kanchev" University of Ruse, and University of National and World Economy) were collected from online sources, such as media interviews or public debates. The DigiTransformEdu survey was conducted in the period January-April 2022 for the desk research and March-September 2022 for the interviews and online questionnaires.

The digitalisation of the HE in Bulgaria should be seen in the context of its membership in the Bologna Process / European Higher Education Area and the European Union. Moreover, it is strongly associated with the development of distance education in the country that historically has strong roots in the higher education spectrum and received a new dimension in the early years of the 21st century when technology was introduced as a means in education. At that time different HEIs started developing and introducing e-learning platforms, a process that was particularly boosted when a serious budget

was invested to support the development of electronic systems for distance education funded in the framework of the Human Resources Development Operational Programme.

The organisation and implementation of distance education in the Bulgarian HEIs is regulated with an Act of the Council of Ministers, whose latest update came into force on 1 September 2021 to replace the Act from 2004. It was the 2004 Act that made it possible to build the necessary infrastructure to allow the Bulgarian HEIs to provide e-learning and was broadly considered as a success factor for the overnight transition to digital education imposed by the COVID-19 pandemic. The most important driver to choose the distance form of education that is now still valid in the case of digital education is the possibility to combine studies with work. At the same time the distance education stayed in the 'shadow' of the regular on-site format that was and still remains the most selected format in Bulgaria where a pure analogue of the 'open university' model is missing.

In the abrupt shift to online mode of delivery, forced by the pandemic, it appears that the institutions that offered distance education and used e-learning platforms before the pandemic managed to make the transition without disruptions and compromising much on quality while others struggled a lot that led to serious omissions in the educational process. This can be explained with the fact that institutions providing distance education are technologically better equipped not only in terms of hardware, software, and technology but also in terms of availability of lecturers and staff trained and prepared to use the technology and deliver distance/online education. In addition, they have established well-functioning centres of distance and online education that oversee all aspects of the delivery of educational, administrative, and enabling services to the students enrolled in distance education programmes.

On the regulatory stage during the pandemic a series of important steps were made that aim to promote and enhance digital education and might help the distance education in Bulgaria to get out of the 'shadow' of the on-site education and develop as a stand-alone educational format that with the flexibility it provides fits the needs of working students and is in line with the current trend of working and studying from anywhere at any time.

For higher education the pandemic has been widely acknowledged as an accelerator for its digital transformation that came along with a range of difficulties and obstacles. Major drawbacks are digital exhaustion, decreasing motivation and engagement of students with a growing sense of isolation, difficulties in joint and practical activities, difficulties in the organisation of online exams and assessment, data protection and privacy concerns, and technical and technological issues alongside with digital skills that were not up to the challenge. Another problem that is common not only for Bulgaria, is that the pandemic increased the digital divide to further deepen the problems for students with disadvantaged social background.

When looking forward, probably the most important opportunity is the range of programmes and initiatives that have been developed or are in the process of development to train and re-train teachers to deliver digital education in terms of using technology but also digitalisation of pedagogy, content, and assessment methods. This refers not only to digital skills but also to cultural, interpersonal, and communication competences. Another positive aspect is the realised need of strategy for digital education to guide educational and training institutions in the organisation and delivery of high-quality digital education and digitalisation of the educational process. There is also an extensive discussion at national, European, and international level about how to narrow the digital gap and ensure inclusive digital education. And last but not least, the DigiTransformEdu project aims to trigger tangible changes in digital strategy, digital pedagogy, and digital competence

within the participating organisations and beyond thanks to the provision of guidance, tools, and resources that should be developed by the end of 2023.

Abbreviations:

- HE – higher education
- HEI – higher education institution
- VET – vocational education and training
- LLL – lifelong learning
- EU – European Union

2. Pre-Covid-19 Status Quo of digitalisation of HE/VET/LLL in Bulgaria

Bulgaria has been a full member of the Bologna Process / European Higher Education Area since 1999. As a result, the Bulgarian Higher Education has gone through a series of significant reforms in the process of harmonisation. In addition, as part of the European Union, Bulgaria adheres to the EU frameworks and programmes in the field of HE and its digitalisation in particular, such as the Digital Agenda for Europe, the Digital Education Action Plan 2021-2027, the European Skills Agenda for sustainable competitiveness, social fairness and resilience, the European Education Area by 2025, etc.

The process of digitalisation of the HE in Bulgaria is strongly associated with the development of the distance education in the country, especially in the early years of the 21st century when technology was introduced as a means in education. Distance education in Bulgaria started gaining popularity already in the 50's-60's of the previous century as it was found considerably suitable for working people. With the emergence of the Internet, technology started to be used in higher education to at first support communication and presentation of learning content that slowly transformed into e-learning.

In response to the e-Learning Action Plan of the European Commission, at the end of 2002 the Ministry of Transport and Communication funded a project to create a pilot Virtual Department of Computing with the participation of 11 HEIs and 4 Institutes of the Bulgarian Academy of Science. In the framework of this project and with the support of the Ministry of Education and Science, 50 computer rooms all over the country were equipped to provide e-learning. As continuation of this project, at the end of 2004 the Bulgarian Virtual University was launched with the involvement of 37 HEIs and 27 Institutes of the Bulgarian Academy of Science. The initial idea was to turn the virtual university into a national educational portal to all HEIs in the country and subsequently to increase its purpose and functions as an autonomous body that creates regional virtual universities and a network of inter-connected virtual libraries. In this respect, the aim of the Bulgarian Virtual University was to provide technical and methodological support to the regional universities in their transition to e-learning and in particular to guide them how to create computer rooms, how to introduce software platforms for e-learning, and how to develop web-based courses, virtual laboratories, digital libraries, centres for distance education and even digital universities and campuses. Another important aim was to promote the integration of the Bulgarian virtual education with European and international virtual education initiatives. However, it is not clear to what extent these ambitions were achieved beyond the realisation of the national educational portal, described by Mitova (2011), as its website (i.e., <https://www.bvu-bg.eu/>) is no longer supported.

At the same time, individual HEIs in the country started developing and introducing e-learning platforms. Some of the platforms are used only for education, others for administration, while some

solutions provide integrated educational and administrative services. Some HEIs developed their own custom-made platforms while others bought standard solutions. For example, a doctoral student developed the e-Learning Shell for Angel Kanchev University of Ruse that was also introduced in other universities and institutes while a bachelor student developed the software for VEDA, the first e-learning platform used in New Bulgarian University. In most recent years standard platforms, such as Moodle and MS Teams, gain in popularity against the custom-made solutions because of the technical support their producers provide and the possibility for integration with other technological tools, such as virtual classrooms or useful add-ons, such as anti-plagiarism software.

A crucial impact on the introduction of e-learning platforms in the Bulgarian HEIs and the opportunity to catch up with the more developed in this respect European countries played the Human Resources Development Operational Programme co-funded by the European Social Fund of the EU. At the end of 2011 the Ministry of Education, Youth and Science through its Directorate General Structural Funds and International Educational Programmes published a Call for Proposals¹ under which 50 projects received 32.5mln BGN (about 16.6mln EUR) in total to support the development of electronic systems for distance education. That allowed the majority of the HEIs in Bulgaria to develop platforms and systems and advance their technological infrastructure that was necessary to provide high-quality distance education but also benefitted the regular on-site educational and administrative services.

Research conducted among more than 12.000 students in the period May-June 2019 for the purposes of the Ranking System for the Higher Education Institutions in the Republic of Bulgaria² demonstrates that before the pandemic the HEIs regularly used different forms of online education, ensured access to online resources, and provided electronically some of their administrative services. More than 2/3 of the surveyed students agree that most of the lecturers take advantage of the new technologies in their teaching (69%) and provide access to their lectures online (72%). Similarly, the respondents agree that they can have free access to the internet in the HEIs (74%), have an easy access to sufficient digital educational resources (66%), and that most of the administrative services in the HEIs are accessible online (67%).

2.1. Policy and practice (national/federal, regional, local)

The organisation and implementation of distance education in the Bulgarian HEIs is regulated with an Act of the Council of Ministers, whose latest update came into force on 1 September 2021 and will be discussed later in the report. The previous version of the Act came into force in 2004 and made it possible to build the necessary infrastructure that allowed the Bulgarian HEIs to provide e-learning and was broadly considered as a success factor for the overnight transition to digital education imposed by the COVID-19 pandemic. The first major requirement to legally permit a HEI to offer distance education is to possess an accredited environment for its provision that includes a

¹ BG051PO001-4.3.04 „Razvitie na elektronni formi na distantzionno obuchenie v sistemata na vissheto obrazovanie”: http://ophrd.government.bg/view_doc.php/5456

² The Bulgarian University Ranking System web portal (<https://rsvu.mon.bg/rsvu4/#/>) was created in 2010 under the project “Development of a Ranking System for the Higher Education Institutions in the Republic of Bulgaria”. It was developed further in 2013-2015 under the project BG051PO001/3.2.04-0001 “Development of the Bulgarian University Ranking System” with the financial support of the Human Resource Development Operational Program 2007-2013, co-financed by the European Social Fund of the European Union and the project BG05M20P001-2.005-0001 “Maintenance and improvement of the developed university ranking system – Phase 1”, with the financial support of the Science and Education for Smart Growth Operational Programme, which is co-financed by the European Union through the European Structural and Investment Funds.

professional software platform dedicated to the provision of distance education and specialised servers that can ensure a broad band internet connection. And then the second requirement naturally deals with offering accredited educational services in the form of Bachelor, Master, and Doctoral programmes. For both requirements the National Evaluation and Accreditation Agency is the responsible independent national body that has the authority to carry out evaluation, accreditation, and quality control in the activities of HEIs as well as to carry out post-accreditation monitoring and control.

2.2. Drivers and motivators

As already mentioned, the main driver for choosing a distance form of higher education is the possibility to combine education with work. This is confirmed by studies trying to identify the profile of the distance education student (Chukurliiev, 2018). The distance education (also called digital, education from home, online and open education) proves to be the most flexible form of higher education that allows broad clusters of people from different age, employment status, residence and with special needs to benefit from educational opportunities and pursue tertiary education.

2.3. Barriers and obstacles

There are various barriers and obstacles for the distance/online education that can be grouped according to different criteria. Probably the most important of them is to ensure quality of delivery. Even though a preferred form of education for working people, the distance education remained in the 'shadow' of the regular on-site format that was and still remains the most selected format in Bulgaria where a pure analogue of the 'open university' model is missing. Distance education is offered alongside the regular presence form and a particular accreditation is required for its provision. As such, the educational offer in terms of programmes and content is based on the on-site format as a starting point and rather as a rule than an exception not adapted to students' or business's expectations and requirements. Often lecturers are less motivated that lowers the quality of educational provision and results in less interest among the potential students while distance education needs exactly the opposite – greater attention to students to compensate for the limited contact with lecturers (Chukurliiev, 2018).

Another challenge that is worth underlining is the distance/online organisation of exams and evaluation of day-to-day work, especially of big groups of students, that has not only to prevent cheating but has to find suitable solutions for authentication, anti-plagiarism and the 'market' for buying ready-made case studies, theses, and other types of project and written assignments.

Other challenges can be listed as:

- Technological that are related to the rapid development of the Information and Communication Technologies (ICT) and the respective (digital) competencies required to deal with them combined with the ever-growing need of high-speed internet connection and up-to-date hardware able to run the technologies.
- Methodological that are related to the peculiarities of distance education in terms of course design, delivery, and assessment. There is already sufficient evidence in the scientific literature that points out to the differences and underlines that the methods used in a face-to-face classroom cannot be transferred to online settings without appropriate adaptations and the use of visual and interactive elements.
- Demographic that are related to the adverse situation in Bulgaria where a stable and relatively high number of HEIs are trying to attract a decreasing number of potential

students, which in some cases translates into a much higher offer than demand in the higher educational landscape. This naturally results in lower quality of education and distrust among employers about the value of certain diplomas. In this context, it is often the quality of distance education and its recognition that pay the price.

- Regulatory that are related to the need to find the right balance between the academic autonomy and the role of the state to ensure the quality of education.
- Political that are related to the membership in the Bologna Process and the European Union and the adherence to the respective frameworks and programmes while attempting to balance with the national interests and context.
- Psychological that are related to higher motivation, self-discipline, and time management of the distance education student who has to remain focused in often distractive environment. Here the resistance to change and educational innovation among a substantial number of educators can be added.

3. During/Post-Covid-19 Status Quo of digitalisation of HE/VET/LLL in Bulgaria

As of 11 March 2020, all schools and HEIs had to move their educational services entirely online in order to respect the required social distancing measures enforced by the government in an attempt to reduce the spread of COVID-19. In Bulgaria as in many other countries in the world, it was the first instance of online delivery of education at such a scale. As the requirement for social distancing was prolonged several times, what was expected to be a temporary measure, spanned over two years and affected five academic semesters, during which not only the course delivery moved online but also the exams and assessments, the university and school administrations and management, the services for students and candidates, the monitoring and control exercised by the Ministry of Education and Science, in fact our entire lives.

While some educational and training institutions managed to quickly shift to online mode of delivery that resulted in generally high satisfaction among both students and teachers, others struggled a lot that led to serious disruptions and omissions in the educational process. During the pandemic in the period April-June 2020, another research was conducted for the purposes of the Ranking System for the Higher Education Institutions in the Republic of Bulgaria among almost 25.000 students. It demonstrated that 95% of the students had already moved to online education and more than 2/3 of them were satisfied with its accessibility, regularity, and the quality of the online classes (between 75% and 83%). Similarly, the survey conducted in the framework of the DigiTransformEdu project revealed high satisfaction with the way their institutions responded to the pandemic and the organisation of the online classes among both lecturers (94%) and students (92%). The reasons behind this high satisfaction were stated to be rapid and adequate organisation of the entire process, prompt transition to online education that kept the schedule of the lessons, teamwork and mutual support, accessible and diverse learning platforms, ensuring laptops and paid technological tools for online education if needed, online access to the university library, etc. Among the shortcomings were mentioned the lack of coordinated position on which learning platforms and virtual classrooms to use and hence the multitude of technologies that were abruptly introduced, problems with the organisation and the scheduling, not sufficient support to teachers and students to ensure their access. While both lecturers and students were generally very satisfied with the online classes under the circumstances, the transition to online administrative and enabling services was less satisfactory and often they had to be provided by phone rather than digitally. Another problematic domain was the online organisation of the exams and the routine assessment. Even

though the majority of the respondents were generally satisfied and when the evaluation was done with the help of projects or assignments, the assessments went smoothly, cheating during the exams and inadequate choice of online tests were often stated as troublesome.

The literature review and the collection of primary data within the framework of the current DigiTrasnormEdu project led to the assumption that there is a correlation between the offer of distance education and the use of e-learning platforms before the pandemic and the speed and quality of reaction in the move to online delivery. Logically, institutions that provide distance education are technologically better equipped not only in terms of hardware, software, and technology but also in terms of availability of lecturers and staff trained and prepared to use the technology and deliver distance/online education. In addition, they have established and well-functioning centres of distance and online education that oversee all aspects of the delivery of educational, administrative, and enabling services to the students enrolled in distance education programmes. It appears that such institutions were very flexible and managed to make the transition to online education without disruptions and compromising much on quality and interaction. However, detailed analyses of the situation based on reliable research data collected from a representative sample of HEIs and their populations have not been yet performed in the country, and as such it is early to make definitive conclusions about digital higher education, its opportunities and limitations, and its efficacy compared to the traditional classroom format (Mihailova, Mirchev, 2021).

When looking more into detail in the technological and communication tools used during the pandemic, the educational and training institutions continued using the e-learning platforms they had developed before that. However, certain modifications and additions had to be made in order to face a situation of distance education, communication, and administration only. Moodle seems to be the most used platform among the HEIs probably because of its open code and the possibilities for adjustments and customisation that the open-source learning management system provides. Another popular platform is Microsoft Teams whose massive application can be explained with the free of charge provision of MS Office 365 Education given by Microsoft to eligible schools and educational institutions³. Additionally, Discord was praised for the easiness of its breakout groups and classrooms. Standard and custom-made solutions to support virtual classrooms (e.g., Big blue button), e-teacher and e-student were added as well as other technological tools that were deemed necessary. In addition, educators started using a wide range of digital tools, some of which particularly aimed for education, such as Kahoot and OpenBoard, while others primarily intended for other purposes but proved very useful under the circumstances like social media, such as Facebook and Messenger, video communication platforms, such as Zoom and Google Meet or their functionalities to support breakout rooms or organise voting polls, collaboration tools like Miro, MURAL and Lean Coffee Table, and many others.

It is exactly here that the educators' digital skills and experience with technology or their absence made the difference and turned some classes into fascinating learning experiences while others remained boring, tiring and almost useless. For example, "I have prepared electronic simulations (games) to be included in the practical exercises and used a digital platform for discussion moderation of the Lean Coffee type." compared to "Many lecturers cannot demonstrate the resources they have prepared because they cannot effectively use the selected software or didn't adapt their class to online teaching." However, on the positive side the majority of students (62%) and lecturers (81%) consider that their digital competence improved during the pandemic and agree

³ <https://www.microsoft.com/en-us/education/products/office>

that the digital competence of their counterparts also improved (77% of the students consider that the digital competence of their lecturers improved and 88% of the lecturers find the same about their students).

An important conclusion that can be made, concerns the difference in perceptions between bachelor and master students and between students and lecturers. Not surprisingly and evident from previous research, bachelor and especially first-year students prefer education on site and if this is not possible, are attracted by hybrid or online education that is as similar as possible to the on-site education (i.e., virtual classrooms, lessons dominated by the teacher, possibility for recorded lessons that they can re-visit and re-view) while master students, who often combine their study with part-time and very often in Bulgaria even with full-time job, prefer more diversity in the format, greater interactivity, and autonomy and are more inclined to move entirely to online education. In this respect, 92% of the respondents to the online questionnaire who were only master students occupying full-time positions find online education more flexible and more timesaving while a very small minority of them point to the negative aspects with more distractive being indicated the most (31%). When asked for their preferred format of education, 46% opted for fully online and 39% for blended while completely on-site and hybrid education were equally frowned upon. Rather different picture can be observed among the lecturers. While they also agree that online education provides more flexibility (75%) and somewhat saves time (50%), the negative aspects were pointed out much more often with 44% acknowledging more personal workload, 38% pointing to difficulties to practice or reflect on what the students have learned, and similarly to students emphasise the distraction risks (31%). The perceptions on the format are also very different with 69% of the lecturers opting for blended education and 25% for completely face-to-face while none of them selected the fully online option. Some quotes by lecturers come to support these findings, “Teaching has turned mostly into giving directions, emphases, and instructions with visual and verbal anonymity on students’ side, they are just listening, especially the bachelor students while the master students are more open.” or “There are differences between the working students (usually 3rd and 4th year) compared to the 1st and 2nd year who are not working yet. The working students participate more adequately in online education because this is the format they prefer.”

3.1. Policy and practice (national/federal, regional, local)

In Bulgaria the end of the 2014-2020 programme period coincided with the end of implementation of the first Strategy for the Development of the Higher Education Sector⁴ that was the first document at such level for the sector. In the middle of the COVID-19 pandemic, a new strategy for the period 2021-2030 was publicly discussed and adopted by the General Assembly on 17 December 2020⁵. Understandably, the impact of the pandemic was reflected in the new strategy and resulted in drawing particular attention upon the digitalisation of Higher Education in the country and setting it as a priority for the period. Actually, the emphasis on digital transformation of education was already set at EU level and transposed in a range of programmes and funding instruments, including the Erasmus+ programme.

⁴ Ministry of Education and Science of Bulgaria, 2015, Strategia za razvitie na vissheto obrazovanie v Republika Bulgaria 2014-2020, adopted by the General Assembly on 26 February 2015: <http://www.strategy.bg/StrategicDocuments/View.aspx?Id=962>

⁵ Ministry of Education and Science of Bulgaria, 2020, Strategia za razvitie na vissheto obrazovanie v Republika Bulgaria 2021-2030, adopted by the General Assembly on 17 December 2020: <https://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=1492>

The new strategy aspires to achieve complete digitalisation and development of the educational systems that is complementary or alternative to the classic higher education. The strategy points out to the need for urgent digitalisation that is imposed not only as result of the pandemic but also due to the worrisome situation of digitalisation in Bulgaria⁶. The possibility that through digital education a higher number of students coming from different backgrounds can be reached is also stressed as an important opportunity. At the same time, it underlines the lack of match between the higher education offer in its current form and the needs of the digital generations and the competencies required by the labour market in the digital era. In this respect, the strategy sets a range of objectives that aim to modernise the educational process and programmes by making them more digital, more practical, more flexible, and interdisciplinary and at the same time focusing more on training teachers to use technology and improving their digital skills. It is important to note that the strategy seeks to significantly increase the programmes for digital distance education and improve the platforms for digital education in order to better respond to the characteristics, needs and expectations of the digital generations. If this is accomplished, it might finally help the distance education in Bulgaria to get out of the 'shadow' of the on-site education and develop as a stand-alone educational format that fits the needs of working students and is in line with the current trend of working and studying from anywhere at any time.

Similarly, under the 'shadow' of the COVID-19 pandemic, on 1 September 2021 a new Act⁷ came into force to regulate the organisation of the distance form of higher education. It came to replace the previous Act from 2004 and naturally targeted the digitalisation of distance education. Probably the most important difference between the two Acts can be found in the definition of distance education. While in 2004 the legislator defined distance education as an organisation of the educational process, in 2021 distance education is already identified as a form of higher education and as such obtaining rather an autonomous status that goes beyond organisation to embrace digital education. While the latest Act is logically more detailed in terms of stating the use of digital means for the organisation, administration, and functioning of digital education, a commonality in the two Acts is the central role of the Distance Education Centre that should be created and responsible to ensure the institutional, regulatory, operational, technological, pedagogical, and other aspects of the distance education.

Another important document adopted during the pandemic period and affecting the digitalisation of higher education in Bulgaria is the Digital Qualification National Programme that was introduced in March 2021. The programme will be implemented for three years and has a budget of 2mln BGN (about 1.02mln EUR). It answers the need to train and re-train academics and make them competent to lead and execute the digital transformation of education and aims to equip them with the necessary (digital) skills. This should further facilitate the education of highly demanded specialists in the ICT sector, in particular, whose profile can meet the labour market needs in accordance with the latest industry trends and requirements. As a weakness of the programme can be considered its intention to benefit only state universities and as such failing to support HEIs that have already proved to be able to educate highly competent ICT specialists but nevertheless can further profit from support in their pursue of excellence.

At institutional level, a range of regulations, directives, and guidelines were adopted and regularly distributed and made available online to guide teachers, students, administrators, and stakeholders through the process of entirely online education. Here again, some institutions managed better and

⁶ According to the Digital Economy and Society Index (DESI) in 2019 Bulgaria ranked last out of the EU countries with among the lowest Human capital and Connectivity scores in the EU.

⁷ https://web.mon.bg/upload/25604/nrdp-distancionno-VU_160321.pdf

faster to organise themselves and similarly to the delivery of teaching, their resilience in terms of institutional functioning and the provision of enabling and administrative services could be related to the status of their digital readiness, equipment, and skills before the pandemic.

3.2. Drivers and motivators

The pandemic has been widely acknowledged as an accelerator of the digital transformation of companies, work, and society. Education is no exception and some HEIs even admit finding it difficult to get students back in the classroom. In this respect, some online classes reached 100% attendance, situation that was rarely observed before the pandemic on site.

There are different reasons to explain why students prefer to continue studying online. Online education was found to be more flexible and convenient for students, especially the more mature ones while freshers suffered the most (Ellyton et al., 2022). As it permits education from anywhere and at any time and has been already emphasised in this report, digital education is particularly preferred by working students and students who otherwise have to relocate and make extra costs for housing or should spend much time in commuting like one student stated, “By not losing time for commuting to the university, I’ve got more time to better organise all of my everyday tasks around the lectures.” or another one, “I can learn from wherever I feel like it, I don’t lose time in commuting and can multitask, doing my housekeeping while listening to the lecture, for example.” Other students found it more relaxed to study from home, “For me, the home environment ensures one of the most important conditions for a successful learning experience and that is calmness. Since the moment we shifted to online education, I find that my learning experience has become more pleasant, relaxed and of course successful.”

Another positive side is the enhanced learning experience due to the increased access to teaching materials and lectures, the availability of recordings, the variety of tools and media used to present the learning content, the amplified use of platforms and social media to communicate and collaborate with co-students and lecturers, etc. Here is a quote of a student explaining the easier access, “I can find information and general material easier and watch the recordings. Everything is generally easier online compared to face-to-face.” In addition, at the end of the pandemic both students and lecturers saw their digital skills improved and different programmes and initiatives were launched at EU, national, regional, and institutional level to focus on the development of pedagogical competencies of teachers and their digital competence in particular. To HEIs, digital education allows to reach to broader groups of students, such as non-traditional learners, disadvantaged or disabled individuals, to go beyond state borders, or target working people.

3.3. Barriers and obstacles

In terms of barriers and obstacles, major drawbacks are the decreasing motivation and engagement of students just like one of them put it “It is very difficult to study online, at least for me. No motivation, constantly sitting closed at home surrounded by the same walls. I am very much against online education.” or a lecturer stated, “The lack of face-to-face contact sets students and lecturers in a situation of distancing and demotivation for learning / teaching.” Often this is due to distractive elements, such as social media or other family members or pets in the same space, expressed in the words of a student, “When I am at home and can do whatever I want, I find a million reasons to get distracted.”, with a growing sense of isolation due to the lack of human contact, expressed in the words of a lecturer, “Isolation is the main reason to lose interest in doing whatsoever, including education.” To these we can add difficulties in joint and practical activities combined with technical and technological issues, summed up by another student, “Depression, no desire to do whatsoever, I was just skipping lectures. It is one thing to be in class, listen to the explanations, and pay attention to

the body language and completely a different story to sit in Moodle, lose connection every two minutes and didn't understand a thing at the end."

In this respect, digital exhaustion was a common problem cited by both students and lecturers (Ellyton et al., 2022), as one student stated "The long hours in front of the computer during lectures and exercises make me tired and demotivated. I get easily distracted when there are no people around me." Likewise, the "no-cameras-on" issue was often emphasised by lecturers as problematic that contributed to the dehumanisation of education and the sense of isolation. The multitude of platforms, they had to deal with, did not make the situation any better either, especially with a significant number of lecturers self-reporting that their digital skills need improvement and the suboptimal status of the technology infrastructure in HEIs impacting the educational process. Simply transposing face-to-face lectures into online teaching did not help either like a student emphasised, "Many of the courses were not developed to suit online education and we got lost. Moreover, the exams were very chaotic. The lecturers themselves often preferred to provide the lectures and the materials separately instead of teaching them online. As such, the communication was very difficult and often it took very long to find an answer to a question you happened to have." However, the educators who took the digital challenge seriously and made the effort to update their courses to online teaching, had to invest much of their time and were overloaded and exhausted at the end, as one lecturer stated, "I am investing much more effort than during the on-site lessons because I have to prepare additional materials and assignments and after that to discuss them with the students."

Another big group of problems concerns technical and infrastructure issues. These issues relate to lacking or slow internet connection, connectivity problems, system failures, devices not working properly (e.g., mic or headphone), background noise and disturbances, lacking internal tools for fast teacher/student communication that imposes the need to use external apps (i.e., Messenger, Instagram, WhatsApp, etc.), etc.

These findings were also confirmed by the respondents to the DigiTransformEdu online questionnaires. The majority of the lecturers complained about internet connection problems (81%) and technical issues (63%) followed by not sufficient student engagement and participation (44%), not sufficient interaction with the students (38%), absences and drop-outs (38%), lack of face-to-face contact (31%), online fatigue and stress (31%), and cheating during online exams and tests (also 31%). Surprisingly the students complained less about internet connection problems (39%) and technical issues (39%) but mostly about the lack of face-to-face contact (46%), and equally (23%) about the lack of appropriate digital tools to carry out certain teaching components, not sufficient interaction with the lecturer, not sufficient interaction with the co-students, and online fatigue and stress.

At the beginning of the pandemic when education had to move online overnight, it was the centres of distance and online education and the IT departments that were most overloaded and had to take important decisions very quickly and in extreme circumstances. In many cases, the e-learning systems and platforms were not up to such volumes at the same time or were not properly equipped with virtual classrooms or secure environments for tests and exams to avoid cheating and plagiarism. Naturally, HEIs that did not have such centres or did not invest in equipment and technology suitable to deliver online distance education had it even more difficult to make and keep everything up and running. In some cases, they even had to start with uploading documents and resources that were not at all available electronically. A particular issue was reported to address the access to libraries, paid databases access to which was ensured only from within the university, and proprietary literature resources. These issues could not be resolved even though attempts to rely on cloud technologies and Open Educational Resources bid partially a solution.

Cybersecurity, data protection and privacy concerns were also issues that were intensified during the pandemic. And while some institutions report to have taken measures and installed specific software, others could not do much. A common challenge that to some extent can explain the “no-cameras-on” practice relates to privacy concerns, as both educators and learners didn’t feel comfortable other people to “enter” their homes. Similarly, particular measures had to be taken to prevent students from cheating and plagiarism during evaluations and exams. Here most institutions report to have used specific anti-plagiarism software, such as Turnitin and PlagScan in addition to introducing procedures and rules for the organisation of the exams (e.g., obligation to have the camera on and to share the screen).

Another problem that is common not only for Bulgaria, is that the pandemic actually increased the digital divide with students from disadvantaged social background suffering the most. They often did not have appropriate internet connection or suitable devices that would allow them to properly follow classes or access the learning platforms or virtual classrooms. During the DigiTransformEdu survey, some evidence was found suggesting that educational and training institutions in Bulgaria were providing lecturers or students in need with devices or other solutions to help them overbridge the difficulties, but it was definitely not a common practice especially in the case of students. In this respect some students recommended to provide such support to students with disadvantaged social, financial or health situation.

In summary, the DigiTransformEdu survey highlighted the following barriers, obstacles, and challenges.

- Initial struggle to start using e-platforms and e-resources without any time for preparation and adaptation
- Initial expectations that the pandemic situation was only temporary that caused delays in the instruction of some courses and resulted in squeezing them that consequently did not allow focusing and devoting enough time on the different topics.
- Lack of direct and on-time feedback from students and trainees about the appropriateness of teaching content, methods, and tools
- Increasing costs for digital tools and services (e.g., some educators paid from their own pocket the subscription costs allowing them to use the videoconferencing platforms with bigger groups and not limited in time)
- Increasing costs to study and test the appropriateness of methods and tools for effective teaching
- Problems related to the connectivity and the shared learning space
- Retaining learners’ attention
- Screen fatigue for both learners and educators
- Difficulties with practical exercises that made them less effective
- Difficulties with and even impossibility to find internships
- Attempts to replicate traditional education in virtual environment without any adaptation
- Problems with authentication and cheating during evaluations and exams
- Staying at home all of the time created the expectation that everybody should be available 24/7
- Conducting a class simultaneously in a physical classroom and online to provide hybrid education because “the lecturer can't be split in three to pay attention to the students in the classroom, the online students and the ones writing in the chat”.

And as one of the interviewees put it bluntly, “For me the main disadvantage is the lack of direct contact with the students. I am used to constantly communicate with the ones present in the classroom. It is not only that I ask questions, but I can see who comprehends what I am talking about. I can “read” in their eyes who is listening and who is already dreaming about the evening programme or the latest post on the internet. If it is needed, I can “wake up” the audience with a question or even a joke. This cannot happen online even with the help of videoconferencing technology. The students are at home and don’t want to switch their cameras on, and you cannot force them – they were still in their pyjamas, the interior at home was not suitable to show, the internet connection was slow and so on, and so forth. And at the same time, they might be not listening at all or not even being in the room. But even if they are online and listening, they cannot “touch” what I am demonstrating, the discussions are not the same as live, we have to wait for each other, we have to speak one-by-one and so on. Another problem is the exams and the regular assessment where it is much more difficult to confront the “group work” during individual tests, or lifelines like “phone a friend”, “ask the audience” and others of the sort. But for me one of the most challenging problems is to supervise exercises when the students have a practical project to work on. It takes much more time to explain, correct and evaluate compared to the classroom format and moreover it is not completely effective. The practical activities that in some programmes can take 50% of the classes suffered the most.”

4. Future Outlook and Opportunities

Probably the most important opportunity is the range of programmes and initiatives that have been developed or are in the process of development to train and re-train teachers to deliver digital education in terms of using technology but also digitalisation of pedagogy, content, and assessment methods. Training and upgrading staff’s, and to some extent students’, skills is a necessity. This refers not only to digital skills but also to cultural, interpersonal and communication competencies.

In this respect, the respondents to the online questionnaires were asked to assess the usefulness during the pandemic of certain teaching practices. Almost all students (92%) and 68% of the lecturers selected tasks to complete individually or in group as the most useful practice followed by online Q&A sessions (77% of the students and 68% of the lecturers), work sessions in small groups with the lecturer (with the cameras on) (69% of the students and 62% of the lecturers), and personalised (one-to-one) guidance and support (also 69% of the students and 62% of the lecturers). The students and to a lesser extend the lecturers appreciated to have a structured communication plan or protocol that in advance announces interaction and discussion moments with the lecturer. Interestingly, teaching practices traditionally considered as an essential element of online education, such as videos and flipped classroom, were found even as not useful by some students and lecturers and generally scored lower than expected. In addition, 38% of the lecturers couldn’t find themselves in shortening the lectures and presentations in order to avoid online fatigue while students were much more positive about this practice with only one student finding it not useful. Moreover, the following practices were cited by the respondents themselves as used to improve their lectures or solve certain problems they faced: project work individually or in groups, dividing students in small groups and grouping them according to their level, demonstrating good practices and examples of students’ project works from previous years, inviting business representatives as guest speakers, making regular breaks, creating communities of teachers on social media to help and consult each other and share best practice, etc.

Another positive aspect is that most of the HEIs and other educational entities realised the need of having a strategy for digital education and are either developing one or improving their existing

strategy to guide them in the organisation and delivery of high-quality digital education and digitalisation of the educational process. In this respect, the approaches that can be considered are (Blagoeva, 2020):

- Smaller groups of students in the classrooms, as the number of students will depend on the available space
- Less on-site lessons for some courses again depending on the available space
- Some of the courses become entirely online
- Combination of on-site and online education at the level of programme/speciality and year of study.

However, what should be kept in mind is that (Ellyton et al., 2022):

- Face-to-face education remains essential to humanise the learning experience and implement practical activities.
- Digital technologies should be applied to transform educational pedagogies and support learning journeys, but not relied upon as the core proposition.
- Content and methods need to be designed specifically for online environments.

There is also an extensive discussion at national, European, and international level about how to narrow the digital gap and ensure inclusive digital education. Inclusive digital education is understood as the provision of digital education that respects diversity and considers the variety of learning and teaching needs and is in the core of another Erasmus+ project⁸ with the participation of New Bulgarian University. In this respect, the DigiTransformEdu survey highlighted the use of a combination of different technologies rather than the reliance on a single one to guarantee that all students are reached, and their diversity considered. Additionally, lecturers should pay attention on their speed of instruction, as it appears often to be suited only to the students who already have some knowledge on the subject and not at all to the ones who are new to it. Concerning this, sessions devoted to questions and answers and e-mail exchanges with the lecturer are found extremely useful as well as setting clear rules for communication in the form of communication plans or protocols. In addition, more should be done to provide technical and technological equipment to the ones in need, especially students with disadvantaged social background and students with disabilities.

Some researchers suggest a framework for the development of mobile education in higher education in order to improve quality (Todoranova and Penchev 2020) through the use of ICT including security protocols and certificates that should improve the secure transfer of data (Petrov et al. 2020) and as such, set the focus on data protection and cyber security of the digital education. In this respect, further work should be also done to improve the test and exam environments to ensure proper authentication and prevent cheating. Nacheva, Jansone (2020) advocate for the development of a practically applicable framework for digital education that takes into account the national, European, and international requirements for higher education i.e., laws, strategies for the digitalisation of education, European policies, frameworks, directives, programmes, etc. In addition, this framework should include guidelines for forming students' skills through digital education.

⁸ The project "Inclusive Digital Education Access: IDEA", is a 2-year Erasmus+ project (2021-2023) that aims to offer guidance and tools that promote and facilitate inclusive digital environments in higher education. The project is centred on the concept of inclusiveness which is defined as the provision of education that meets the expectations, needs and constraints of all students (<https://theideaproject.eu/>).

Ivanova (2021) argues that to achieve quality digital education, it is necessary to:

- Synchronise the national and European strategies and actions for the digitalisation of education
- Remove the regulatory obstacles that hamper the delivery of open and digital education
- Stimulate the European HEIs to improve their institutional approaches towards digitalisation
- Develop structures and strategies for the continuous improvement of digital education and the choice of strategic approaches to digital education
- Develop an action plan for digital education that includes measures to improve lifelong learning and flexibility and to stimulate the development of digital skills and competencies
- Introduce shared responsibility for digital education and involve students in managing digitalisation
- Develop digital skills in two directions: digital skills specific to the field of education and general digital competence
- Promote digital ethics (the so-called netiquette⁹)
- Synchronise the process of digitalisation with the process of quality assurance
- Stimulate internationalisation and virtual mobility – maintain international academic cooperation
- Reflect the transformational impact of digitalisation upon the academic and administrative staff, and the students
- Improve data analyses, and academic research and forecast
- Update the institutional policies for remote work
- Improve the use of digital libraries to increase digital capacity
- Research innovative teaching methods and new instruments for communication and collaboration
- Define vision for the ‘new normal’ and what we would like it to be.

The lessons learned and the new opportunities that stemmed from the pandemic in the eyes of the respondents, surveyed in the framework of the DigiTransformEdu research, can be summarised as follows.

- Teamwork, as quoted by a student, “For many of the courses we have to work in a team on a common assignment or project and because of that we had to improve the communication with the co-students. We have used various online platforms for the teamwork and as such, managed to quickly finish our assignments.”
- Flexibility
- Building readiness to work under force-major and digital resilience
- Constantly adapting and updating learning content and pedagogical methods to the current needs, conditions, and technologies
- Developing simulation models and gamification while stimulating the active participation of educators in these activities as part of their professional development
- Precious experience that can help finding the right balance between online and on-site teaching methods for each individual programme or course
- Involving students’ councils and bodies
- Decentralisation and limiting regulation at national level

⁹ Netiquette is a made-up word from the words net and etiquette. Netiquette thus describes the rules of conduct for respectful and appropriate communication on the internet.

- Taking initiative, sharing best practices, and funding development projects.

Finally, the Digital Transformation of Higher Education and Training project, of which this report is part of, aims to trigger tangible changes in digital strategy, digital pedagogy, and digital competence within the participating organisations and beyond thanks to the provision of guidance, tools, and resources. The focus on the strategic aspect of digitalisation will result in a blueprint to guide HE and VET institutions in the development of a digital strategy. By mapping successful practices, approaches and tools used for the design, delivery, and assessment of digital education, a set of guidelines and operational tools will be defined in the form of a blueprint to assist in making the transition from a traditional class-based pedagogy to a blended or pure digital one. By reflecting on the different roles of the digital educator and relying on the conducted analyses and identified learning needs, inputs about the knowledge and skills needed for each role and ways to assess them will be collected and a model will be elaborated that can be used to design training.

5. Conclusion

The COVID-19 crisis forced HEIs to move their courses online rapidly and embrace digital education. Although some universities have been delivering distance education for years and had established e-learning platforms, the situation was far from optimal for the majority of them. Most of the institutions were not prepared for this radical switch. They found out that infrastructure was lacking, the digital skills of lecturers were not up to the challenge, and that even the familiarity of students with digital tools and platforms was lower than expected. There was no time for instructional design and conceiving a new format of lectures and assignments. As a result, the adoption process for both lecturers and students was affected, and the quality of the educational delivery and the learning experience of students suffered. However, under the circumstances they demonstrated understanding, compassion, and responsibility and at the end of the day were rather satisfied with the abrupt transition to online education and the organisation and delivery of online classes.

The pandemic was also a tipping point for digital transformations. Not because it significantly altered the solutions, but rather because it amplified the need to implement them fast. On one hand, the crisis emphasised the potential of online teaching and learning, but it also revealed huge gaps in the delivery capacities of educational institutions as well as gaps in the capacity of individuals to actively participate and take up what is being offered. It was the right time for many educators to update and enrich their lectures and to optimise and modernise their practical exercises. Many of us found new means of communication, which we didn't even know they existed. Moreover, we have learned to control processes and enormous flows of constant questions and materials without having the direct contact with the students.

As now we are moving back to 'normal', we should continue reflecting on the situation of pandemic imposed online education, identify the good practices and lessons learned and use them to go forward and improve the way we provide digital education, as one thing is certain, digital education is here to stay. In this respect, a lecturer said, "The online distance education is already a regular teaching method and a good alternative for specific cases. However, the fact that I do not know my students in person and that there is no sense of academic community can destroy the trust in the institution." So, the way forward is to shift the focus from technology, as it used to be before the pandemic, to the 'human side' of education in terms of digital skills, competencies and practices.

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