

PROSPECTS OF USING REMOTE TEACHING IN SCHOOL EDUCATION – RESEARCH FINDINGS

Małgorzata MICHALCEWICZ-KANIOWSKA^{1*}, Anna KOMARNICKA²,
Cosmina-Simona TOADER³

¹ Bydgoszcz University of Science and Technology, Department of Economics and Marketing, Faculty of Management; malgorzata.michalcewicz-kaniowska@pbs.edu.pl, ORCID: 0000-0003-2154-5838

² Bydgoszcz University of Science and Technology, Faculty of Management, Department of Innovative Organization Management; anna.komarnicka@pbs.edu.pl, ORCID: 0000-0003-1705-1376

³ University of Life Sciences “King Mihai I” from Timișoara, Department of Management and Rural Development, Faculty of Management and Rural Tourism, Calea Aradului No. 119, 300645 Timișoara, Romania; cosminatoader@usab-tm.ro, ORCID: 0000-0003-1564-8558

* Correspondence author

Purpose: The purpose of this paper is to assess the prospects of using distance teaching for various forms of education as perceived by teachers. The study also sought to provide feedback on how remote instruction was provided and to identify methods and forms of instructional work preferred by teachers during the period under study.

Design/methodology/approach: To achieve this purpose, a quantitative method has been employed, based on a survey conducted electronically using Google tools. The survey respondents were 9,070 teachers employed in the Kuyavia-Pomerania region of Poland, who represented nearly 30% of the total teacher study population in the area.

Findings: The results of the study indicate that more than 50% of the teachers recognise the significance of the potential of distance teaching, although only a small group of the teachers (less than 10%) consider it feasible to completely replace conventional classes with remote classes. The preferred methods and forms of remote instructional work are multimedia presentations (over 50%) and playback of classes in video format (33%). The overwhelming majority of the teachers (60-70%) emphasise the importance of conducting live classes. In every aspect of the study, about 30% of teachers did not express their opinions, which may suggest their lack of knowledge of distance learning possibilities.

Practical implications: Results of the study may be of interest to both researchers and practitioners investigating the evaluation and development of potential applications of distance teaching in various aspects of education. The findings may serve to develop solutions that address actual challenges faced by teachers in the distance learning process more adequately, contributing to the improvement of this educational process.

Originality/value: This study may contribute to the discussion on the role, benefits and challenges of distance teaching in the educational system. Concomitantly, it offers an important contribution to the debate on adjustment of national and regional distance teaching strategies to the specific needs of teachers working in different types of schools.

Keywords: education system, distance learning, e-learning, teachers' attitudes, distance teaching methods.

Category of the paper: Research paper.

1. Introduction

The economic and social progress seen in recent years is heading towards a digital world, where the importance of knowledge is emphasised and all people who have knowledge and skills are the most sought after in the labour market. Thus, when knowledge is the key, education is the means to acquire new knowledge (Bušelić, 2012).

Although changes are being noticed in all spheres of people's lives, in many cases education is lagging behind. This is due to the fact that teaching and learning methods are not always up to date, whereas the rate of development is faster than the rate of adoption of the methods (Burdina, Krapotkina, Nasyrova, 2019).

Another aspect that ought to be mentioned is that the information needs and knowledge of students are frequently mishandled. Moreover, teachers' knowledge and skills are oftentimes outdated or perhaps inadequate to current needs, and in some countries and regions the level of socio-economic development is low (Oliver et al., 2010).

Concerns about education and behaviour in the education market vary from generation to generation due to different values, ambitions and work styles (Figure 1).

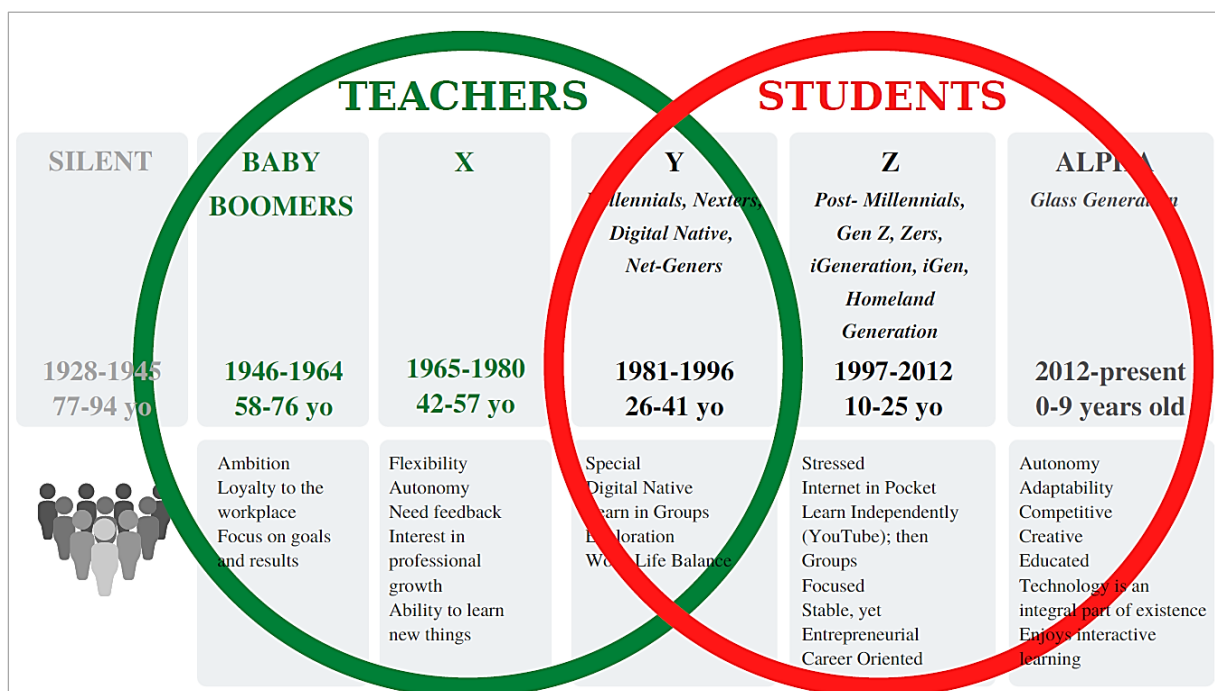


Figure 1. Generational differences in education: from the Baby Boomers to Generation Alpha.

Source: own work based on (Dimock, 2019; Generations in Higher Ed., 2018; dos Reis, 2018).

Presently, there are four generations “active” in the education system, or even five, if we include Generation Alpha. Teachers belong to Baby Boomers (those born between 1946 and 1964), Generation X (born between 1965 and 1979) and Generation Y (born between 1980 and 1989) while students and pupils belong to Generations Y, Z (born between 1995 and 2010)

and Generation Alpha (born after 2010) (Dimock, 2019; Generations in Higher Ed., 2018; dos Reis, 2018).

Persons from the generation of Baby Boomers are ambitious and associate success with unremitting work, dedication, acceptance of authority, concern about one's status and acceptance of a hierarchical work structure. Baby Boomers are loyal to their workplace, competitive as well as goal-oriented and results-driven (Hayes et al., 2018; Leslie et al., 2021).

Generation X are characterised by flexibility, autonomy, a sense of belonging, the ability to work as a team, the ability to learn new things, the need for feedback, a strong interest in professional development, entrepreneurship and earning rewards in a short period of time (Gursoy, Chi, Karadag, 2013).

Members of Generation Y are self-confident and intelligent, digitally literate and multitasking, preferring teamwork, passive approach to problem solving; they are also reliant on others to solve problems.

Those who belong to Generation Z are independent, they dislike authority, maintain a global perspective and are tolerant. They are technology consumers and admirers of the digital world. For Generation Z, learning is an active experience that includes participatory activities; they show a tendency to socialise and learn online; they consume and produce digital information and they are oriented towards a personalised career. For Generation Z, school is not just a period of intellectual development but rather a time for preparing for a career, with curiosity being the primary motivating factor for choosing a course of study. As far as the concentration span of Generations Y and Z is concerned, the difference between them is 4 minutes. In comparison to Generation Y, Generation Z have a shorter concentration span, which amounts to 6 minutes (Karakas, Manisaligil, Sarigollu, 2015).

As for Generation Alpha, let us mention that some members of this generation have not even been born yet, so the set of their traits is still "open". The main characteristics of Generation Alpha are autonomy, adaptability, competitiveness, creativity, practicality, intelligence, courage, leadership, impatience, agility and a strong desire for new challenges. Generation Alpha members will be hard-wired to the Internet and are likely to be better educated than the other generations (Apaydin, Kaya, 2020).

While previous generations were considered part of a homuter (homo + computer) community, today's pupils and students can now be classified as belonging to a mobile community, as for them mobile phones, iPods and tablets are the main channel of communication and learning (Rammert, 1996).

Rapid proliferation of technology has led to virtualisation (Huda et al., 2017). With virtualisation, basic social needs are satisfied through computers and mobile devices, which is indicative of a new phenomenon – cybersocialisation (Gaol, Hutagalung, 2017). In an increasing number of educational institutions around the world, computer literacy is being introduced as a separate subject studied since the early years at school (Ng, 2011).

In this context, the current pace of virtualisation leads to finding new approaches and methods of teaching and learning, and one of these approaches is distance learning. Remote learning can make education accessible to a larger population and the implications of factors such as distance or level of development can be reduced.

2. Literature review

The COVID-19 pandemic has led to major changes throughout the world, in all sectors of the economy, and has indirectly left its mark on the lives of everyone. The measures put in place during the pandemic also affected the education system (Toader, Licaj, 2021).

To continue to hold classes meant a transition to an online environment, with digital classes supplanting face-to-face classes. In this context, distance learning was an alternative to proceeding with class teaching during the lockdown, which has led to a new approach to teaching and learning on the part of teachers and students alike (Picca et al., 2021).

On top of that, as individuals were switching to telecommuting, they began to increasingly pursue digital learning in order to develop the skills required to adapt to today's world.

The COVID-19 pandemic has fast-paced our rapidly changing world, where technologies such as artificial intelligence and automation continue to bring major changes to labour markets.

In this context, access to high-quality online learning is an essential step in supporting people to acquire skills for the future and to seek and find new opportunities for growth and development.

With a surge in people opting for online education, demand for online courses is continuing to grow after the pandemic. In 2021, 92 million learners registered on the global education platform Coursera, a 29% increase over the year before. A majority of Coursera learners are striving to gain or improve their professional skills in order to enhance their prospects for employment on the labour market (2021 Impact Report. Serving the world through learning, 2021).

Remote education is not a new concept; numerous educational institutions have already developed curricula for various levels of education by way of remote education (Traxler, 2018).

Over time, remote education has developed into its present form due to technological development. What at first was correspondence courses has evolved into today's media-based or Internet-based learning through the use of a variety of devices (Bashitialshaaer, Alhendawi, Lassoued, 2021).

Remote education is predominantly prevalent in adult education. In recent years, this form of education has been developing impressively owing to digital technology (Traxler, 2018).

According to specialist literature, remote education has had several definitions over the years. Remote education has been defined by Holmberg as a method that encompasses those levels of education in which students do not have direct contact and continuous supervision by teachers, as is the case in face-to-face classes, and the entire process is planned, organised and directed by teachers in the relevant institution (Holmberg, 1977).

The United States Distance Learning Association (USDLA) has defined remote education as “the process of acquiring knowledge through a variety of media used to transfer education and information, including all types of technology and various forms of education level for distance learning” (Definition of distance learning, 2004).

The concept of remote education is considered an approach of the education system that does not fit entirely into the philosophy of education. This concept presupposes the progression of the educational process without direct contact between the teacher and the students – the students are free to join classes when they want and from wherever they want. In that scenario, nowadays, technology is the link/interface between all participants in the educational process (teachers, students) and without it they cannot interact with each other (Bashitialshaer, Alhendawi, Lassoued, 2021; Moore, Dickson-Deane, Galyen, 2011).

Remote education involves adopting methods differing from those of the traditional education system. In this regard, Al-Saleh and Amira present methods used in the learning process, such as flexibility in acceptance and learning, as students can benefit from this type of education anytime and anywhere (Al-Saleh, 2013; Amira, Tarshoun, Olayan, 2019).

That is why nowadays remote education is an educational system where exchange of information between the teacher and the students has to be supported by digital infrastructure for training and learning, educational materials as well as digital skills of the teacher and the students (Singh, Thurman, 2019).

Online learning is thought of as learning conducted in synchronous and asynchronous settings using technology (an array of devices such as mobile phones, tablets, laptops). In this way, students can be anywhere while learning and interacting with teachers, in the meantime sharing experiences with their classmates.

To provide this kind of instruction under optimal conditions, in addition to digitally literate students and teachers who have high digital qualifications, a secure and sustainable digital infrastructure is needed (Al-Saleh, 2013; Amira, Tarshoun, Olayan, 2019).

An upward trend today is to use mixed-mode and distance teaching based on digital technologies for knowledge transfer (Salasan et al., 2021).

The emphasis on remote education is pressuring teachers into incorporating new technologies into teaching, introducing new pedagogical and evaluation methods, a new system in which integration will be greatly facilitated for persons with disabilities. The fact that the new system will be more easily accessible to disadvantaged groups will be advantageous for the community as a whole, leading to greater equality in certain populations. However, one issue that deserves particular attention is the improvement of infrastructure.

Drawing on surveys on students' and teachers' opinions regarding distance education in different countries, a plethora of articles have been written (Abdallah, Abdallah, 2022; Andronic et al., 2012; Bariş, Çankaya, 2016; Carpinelli et al., 2006; Çalış Duman, Aksoğan, 2020; Karakoyun, Kavak, 2009; Porozovs, Valdemiers, 2019; Psychogiou, Karasimos, 2019; Solpuk Turhan, 2019; Rizwan, Iftikhar, 2019) addressing different levels of education (Kochan, 2021; Petek, 2021).

A number of articles have been written in the context of the COVID-19 pandemic (Ferraro et al., 2020; Gayvoronskiy, 2020; Erdoğan, Ayanoğlu, 2021; Boronina, Baliarov, Sholina, 2021; Marek, Chew, Wu, 2021; Todri et al., 2020; Васильченко, Шацька, 2021; Winiarczyk, Warzocha, 2021; Sałatarow, 2020) and certain authors have emphasised the challenges faced by students and teachers (Diana, Suhendra, Yohannes, 2020; Dietrich et al., 2020; El Refae, Kaba, Eletter, 2021; Toader, Licaj, 2021; Weltrowska et al., 2022; Domagała-Zyśk, 2020) and have highlighted the challenges of distance learning (Düzgün, Sulak, 2020; Poláková, Klímová, 2021; Türkan, Leblebici, Önal, 2020; Urlica et al., 2021; Ismail, Nazeri, Mohamad, 2021; Zajdel et al., 2021; Kochan, 2020).

Most of the studies have employed quantitative methods for data collection, with the research method being a questionnaire and the research instrument – an online survey. Before deployment, the questionnaires had been tested by administering them to a small group of individuals in order to identify errors and correct them (Marek, Chew, Wu, 2021; Rahmadi, 2021).

3. Materials and Methods

This study was conducted as the first and only comprehensive regional study in Poland within the framework of the project titled “Conditions, potential and prospects of using distance teaching in the modern education system” in one of Poland's 16 regions – the Kuyavia-Pomerania Province. The project is being carried out in cooperation with the Bydgoszcz Board of Education.

The study involved all primary and secondary school teachers, school principals and first-year students of the UTP University of Science and Technology who were the first secondary school-leavers to have taken classes remotely for a full semester at a secondary school. The main objective of the study within the framework of the project under way was to identify determinants of the instructional process carried out remotely and to investigate the potential of this form of teaching and of using it to improve the quality and attractiveness of the educational offer of schools and educational institutions. Specific objectives of the present study included the following: (1) identify the determinants of the instructional process carried out remotely, (2) investigate the potential of remote teaching and (3) determine possibilities for using remote teaching to improve the quality and attractiveness of classes.

Findings of a prior study published earlier on have made it possible to assess the workspace and technical conditions as well as the manner in which the teachers conducted remote classes; what forms of distance education were used by the teachers; what was the teachers' evaluative opinions on the general idea of remote teaching, with an attempt to indicate and assess potential determinants of conducting remote classes and conditions of providing students with remote instruction (Zajdel et al., 2021).

The present paper focuses on findings of a study into prospects of using remote teaching in the opinion of teachers.

The research instrument consisted of a survey questionnaire, which in the first stage of the research process was submitted for consultation to experts of the Bydgoszcz Board of Education and the teachers. After conducting a pilot study among the teachers, the survey questionnaire proper was developed; it covered the following thematic areas: (1) workspace and technical conditions of the remote classes taught, (2) potential determinants of distance teaching and (3) potential possibilities for use of distance teaching. The study questionnaire included open-ended, semi-open, closed-ended and semi-closed questions. Questions with an ordinal bipolar rating scale were the most common. The method of data collection from primary sources was an online survey. The survey was conducted by electronic means using tools provided by Google. In total, the link to the survey questionnaire was shared via the Information Panel of the Board of Education (PIKO) with 32,155 teachers in the Kuyavia-Pomerania Province.

As the scope of the survey covered the entire study population of teachers, it was not necessary to select a sample from this population. This has ensured that the study is exhaustive by nature, as it includes the entire population under study, preventing sampling errors such as lack of full representativeness or random errors.

An important stage in the summary of the first stage of the scientific research conducted jointly with the Kuyavia-Pomerania Superintendent of Schools in Bydgoszcz was organisation of the 1st National Scientific e-Conference titled "Uwarunkowania, potencjał i perspektywy wykorzystania zdalnego nauczania w systemie nowoczesnej edukacji" (Conditions, potential and prospects of using distance learning in a modern education system). The conference was addressed to the scientific community, teachers and headteachers of public schools of all types, school superintendents and inspectors in Poland, local government units as well as all those who were interested in the process of remote education. This 1st e-conference was held under the auspices of the Minister of Education and Science and the Marshall of the Kuyavia-Pomerania Province, which significantly raised its status while emphasising that the topic, its importance, relevance as well as the scale of the research and its usefulness are crucial in shaping national educational policy. On account of the fact that the e-conference was a presentation of scientific achievements of great importance and nationwide scale, it was broadcast live on YouTube on 10 March 2021, from 3.00 p.m. to 5.00 p.m. The conference was attended by 1250 persons and to date the event has been viewed by more than 4300 persons (<https://www.youtube.com/watch?v=AxKABlaCQ90>). The research conclusions and

recommendations were forwarded to the Ministry of Education and Science and authorities of the Kuyavia-Pomerania region.

4. Results

The object of the study was the group of all teachers employed in the Kuyavia-Pomerania region in Poland. Among the educational institutions were primary schools, vocational schools, general secondary schools, post-secondary schools as well as special schools of all kinds and technical schools. The study has encompassed 32,155 teachers in total. A total of 9070 teachers directly participated in the study, representing just under 30% of the total study population. The largest number of study participants was observed in the group of primary school teachers (71.11%) and in general secondary and technical schools, accounting for a total of 21.64% (Table 1).

Table 1.

Respondents grouped by age and school type

BREAKDOWN	WOMEN	MEN	TOTAL	
	[%]	[%]	NUMBER	[%]
vocational school	1.72	1.11	257	2.83
general secondary school	6.37	2.27	784	8.64
primary school	61.57	9.55	6450	71.11
post-secondary school	0.45	0.14	54	0.60
special schools of all kinds	3.15	0.66	346	3.81
technical school	8.69	4.31	1179	13.00
TOTAL	81.95	18.05	9070	100.00

Source: own work based on conducted research.

The most numerous group (3416 respondents – 37.66%) were the 41-50-year-old teachers, while the second most numerous group (2845 respondents) were, in turn, the 51-60-year-old teachers (31.37%). Nearly every fourth teacher was aged 31-40 (28.84%). It could therefore be established that in all schools and educational institutions, 41-60-year-old teachers are the most prevalent group, comprising about 70% of all teachers. It is worth noting that in primary schools, the largest share is held by teachers in the age group of 41–50 years (35.67%) and 51-60 years (33.21%). Teachers aged 41-50 constitute the dominant group in both high schools (45.54%) and technical schools (41.90%). The study showed that 3153 (34.76%) of respondents are employed in schools and institutions in the rural areas, with 2907 (45.07%) respondents working in primary schools. In towns with up to 50,000 residents, the most numerous groups were vocational school teachers (107 persons – 41.63%), secondary school teachers (267 persons – 34.05%), and technical school teachers (477 persons – 40.46%).

At the first stage of the research process, it has been demonstrated that more than 80% of the teachers have used their own private technical devices, including more than 90% of teachers using their laptops and approx. 75% of teachers – their smartphones (Zajdel et al., 2021).

Every third teacher utilised school-provided classrooms at least once, or every second teacher in the case of vocational schools. It should be noted that the assessments of both the stability and the speed of internet connection have not shown significant variations in the teachers' opinions in the context of localisation of the school, with both parameters having been rated as relatively poor. With consideration of school location, the average rating of the connection stability was 3.35 on a scale from 1 to 5, while the average rating for its speed was 3.42. The most significant challenge in remote classes, as perceived by teachers, was the unstable parameters of the internet connection, particularly among those residing in smaller towns and rural areas.

Moving on to the area of prospects for using distance teaching, the analysis first referred to supporting traditional classes with this form. There is no doubt that the remote form of teaching can be used in various forms, such as in the preparation for external examinations, in conducting so-called compensatory classes and additional classes for interested students, in conducting remote classes by specialists as well as the use of remote teaching in individual teaching or pedagogy for parents.

The analysis of the collected material shows that one in three teachers believes that distance teaching can support the preparation for external examinations and compensatory classes. It is worth noting that, similarly, one in three teachers has no opinion on the subject (Figure 2).

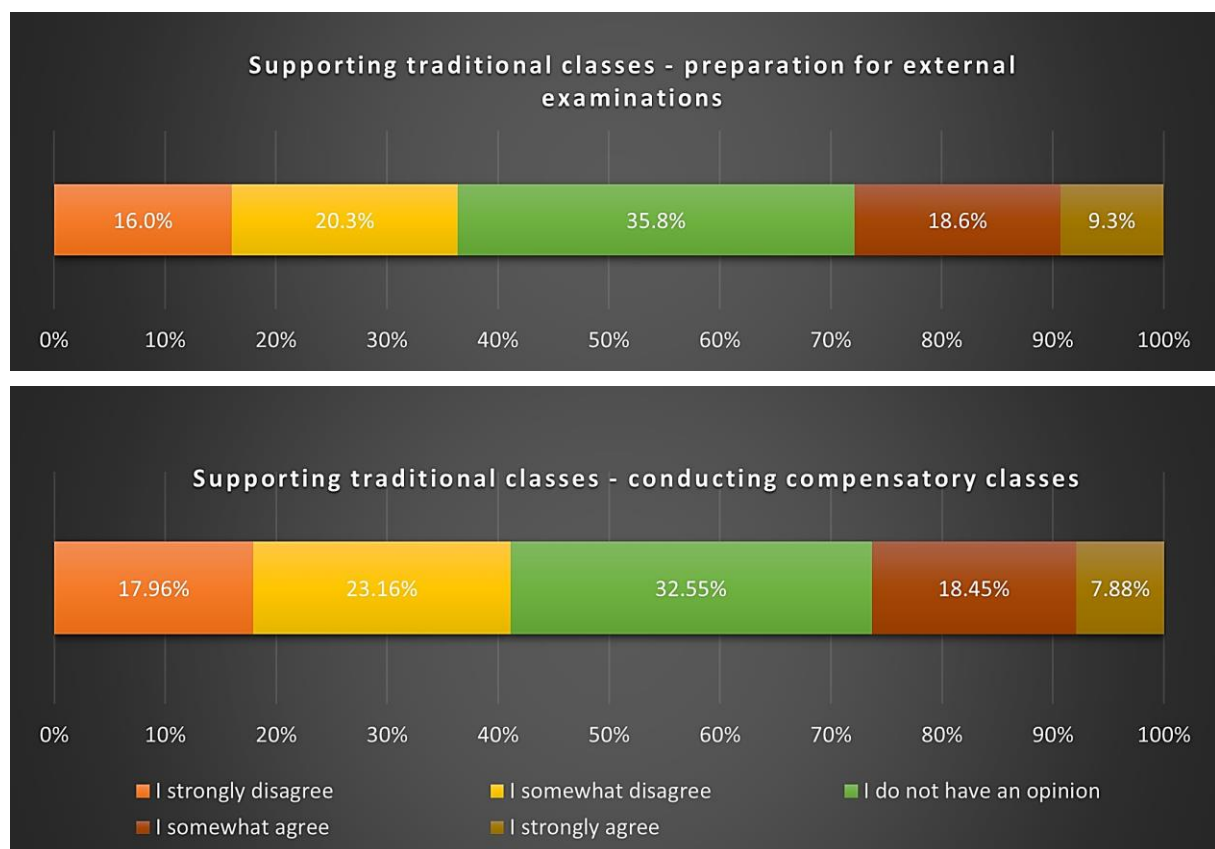


Figure 2. Possibilities of using distance teaching in preparation for external examinations and conducting compensatory classes.

Source: own work based on conducted research.

Every second teacher believes that distance teaching can support the provision of additional classes for interested students and almost 40% of teachers acknowledge the participation of specialists in classes. Similarly, one in three teachers has no opinion on the subject, which may indicate a low level of knowledge in this area (Figure 3).

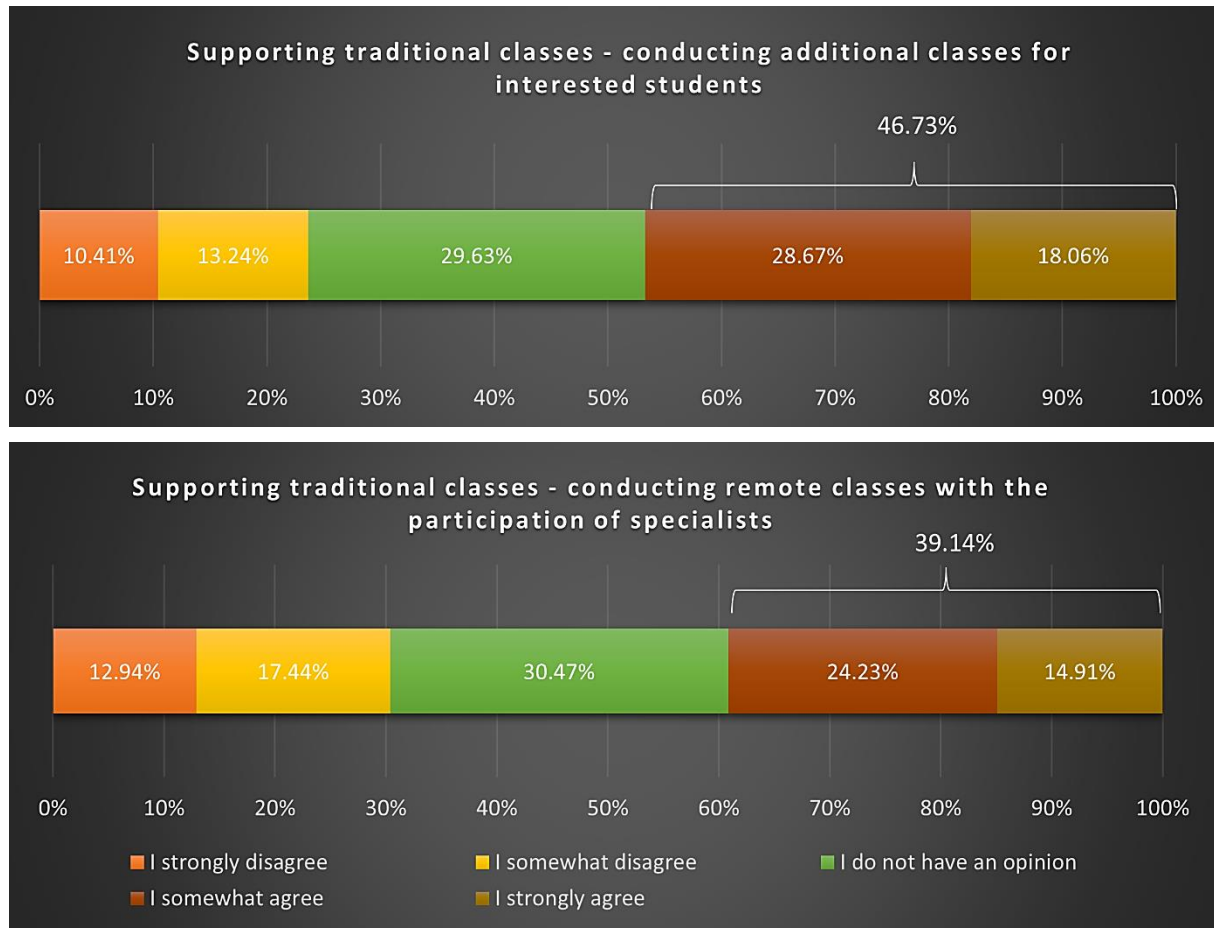


Figure 3. Possibilities of using distance teaching in conducting additional classes and classes involving specialists.

Source: own work based on conducted research.

According to 50% of teachers, distance teaching can support individual instruction and about 30% of teachers see the possibility for pedagogues to participate in meetings with parents (Figure 4).

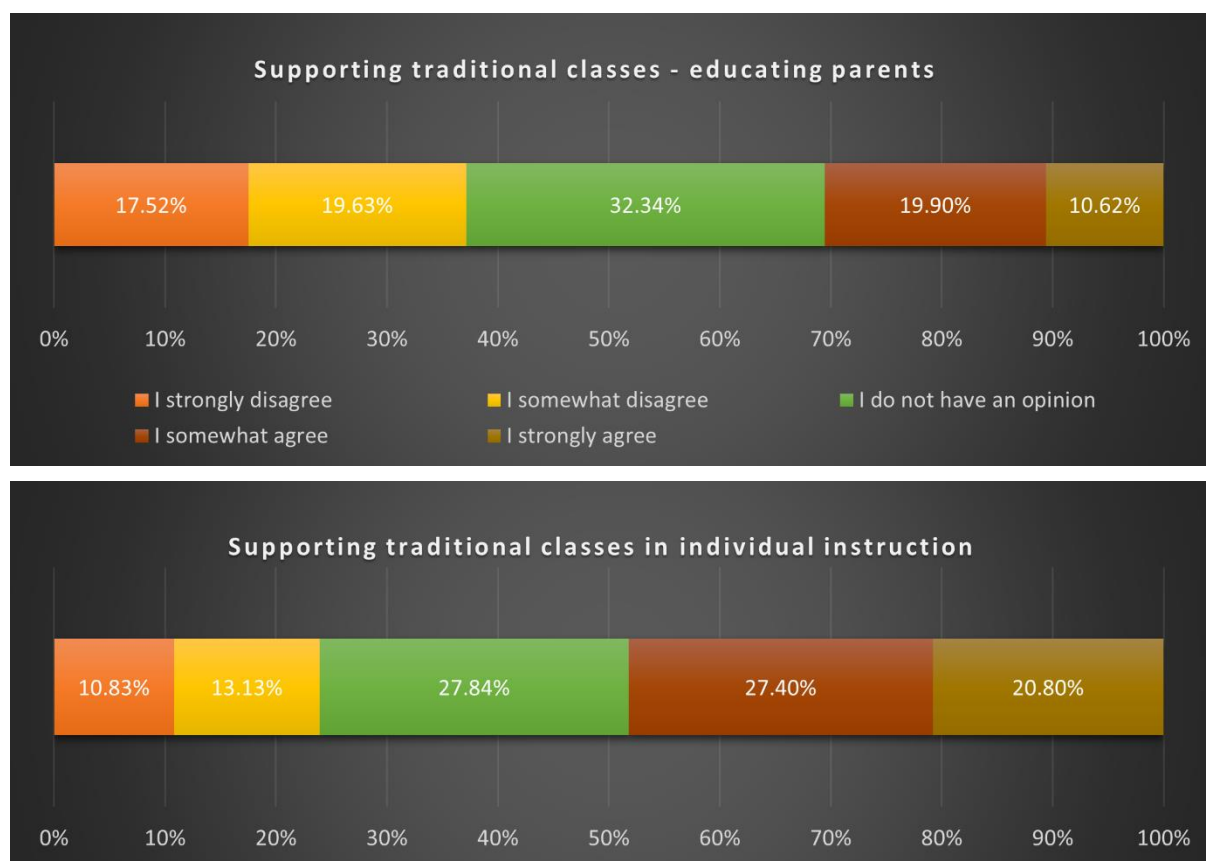


Figure 4. Possibilities of using distance teaching in individual instruction and educating parents.

Source: own work based on conducted research.

The use of distance teaching for various forms of education was rated with an average score of 3.04. Above-average scores were given to: individual instruction (3.34), additional classes (3.31) and involvement of specialists (3.11) (Figure 5).

A detailed analysis of the problem shows that about 25% of the teachers exclude the possibility of using distance teaching in the future, while more than 50% see it as a possibility. Considering the analysis of the problem in the context of different categories such as age of the teachers, type of school or location, the same trend in evaluation was observed.

The question of teachers' attempts to indicate the share of classes that could be taught remotely for different instructional forms deserves to be addressed. One in two teachers, regardless of the type of school, recognises the possibility of teaching up to 20% of classes remotely. Less than 10% of teachers fully recognise the possibility of replacing traditional classes with remote classes. Of the surveyed population, 15.34% rated the possibility of giving individual instruction at 81 to 100%. One in ten teachers (10.34%) believed that additional classes could be conducted in the same setting. Focusing on the indication of the lack of possibilities for distance teaching, it is worth noting that 28.84% of the teachers referred to lesson teaching, 27.23% of the teachers – to compensatory classes, 16.39% to additional classes, 13.56% to individual support and 22.91% to preparation for external examinations (Figure 6).

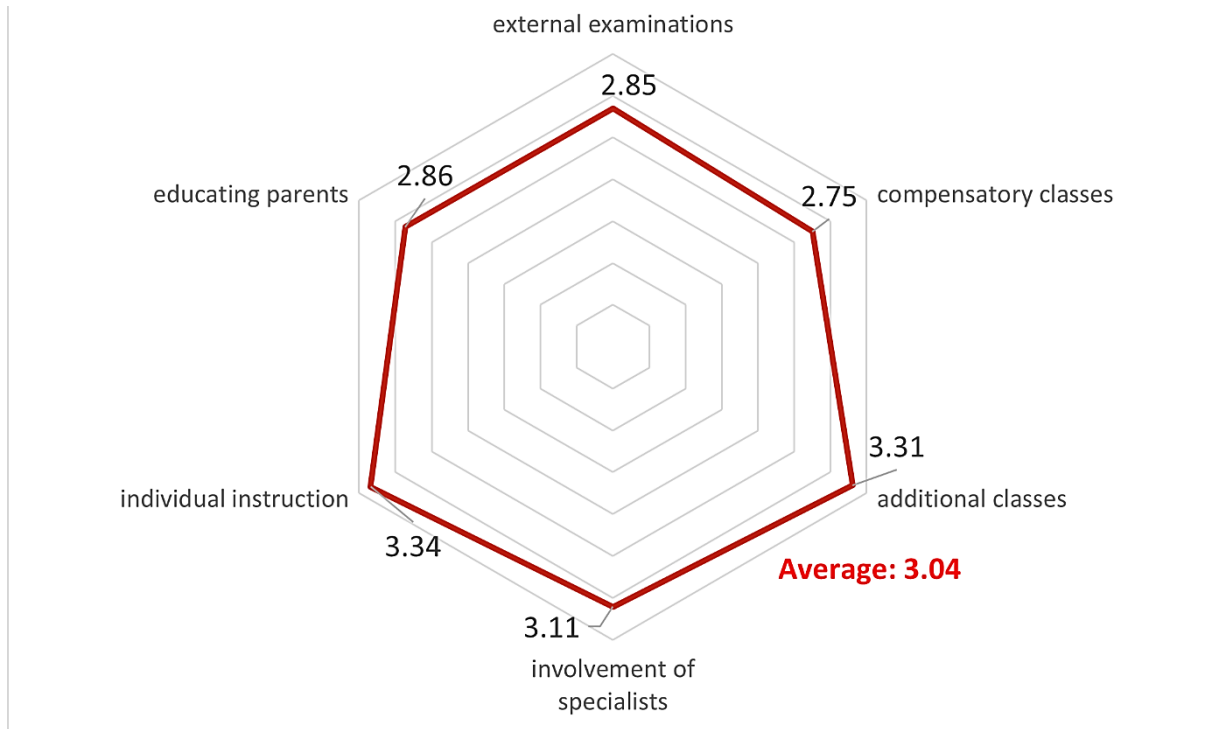


Figure 5. Overall evaluation of the possibilities of using distance teaching according to teachers.
Source: own work based on conducted research.

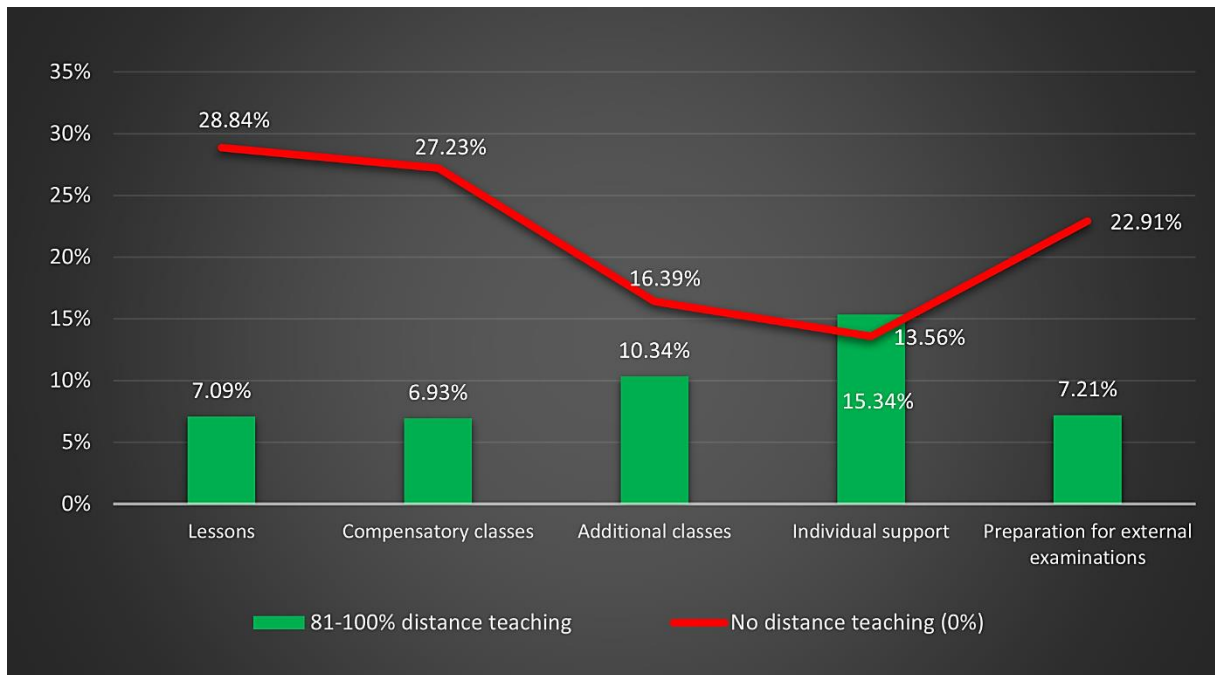


Figure 6. Overall evaluation of the possibilities of using distance teaching according to teachers.
Source: own work based on conducted research.

The study also sought to provide answers on how remote classes were conducted and which methods and forms of instructional work were preferred by teachers during the period under study. The results of the study show that 65.05% prefer live classes. More than 53% of teachers point to the use of a multimedia presentation and more than 35% to playback of classes in video format (Figure 7).

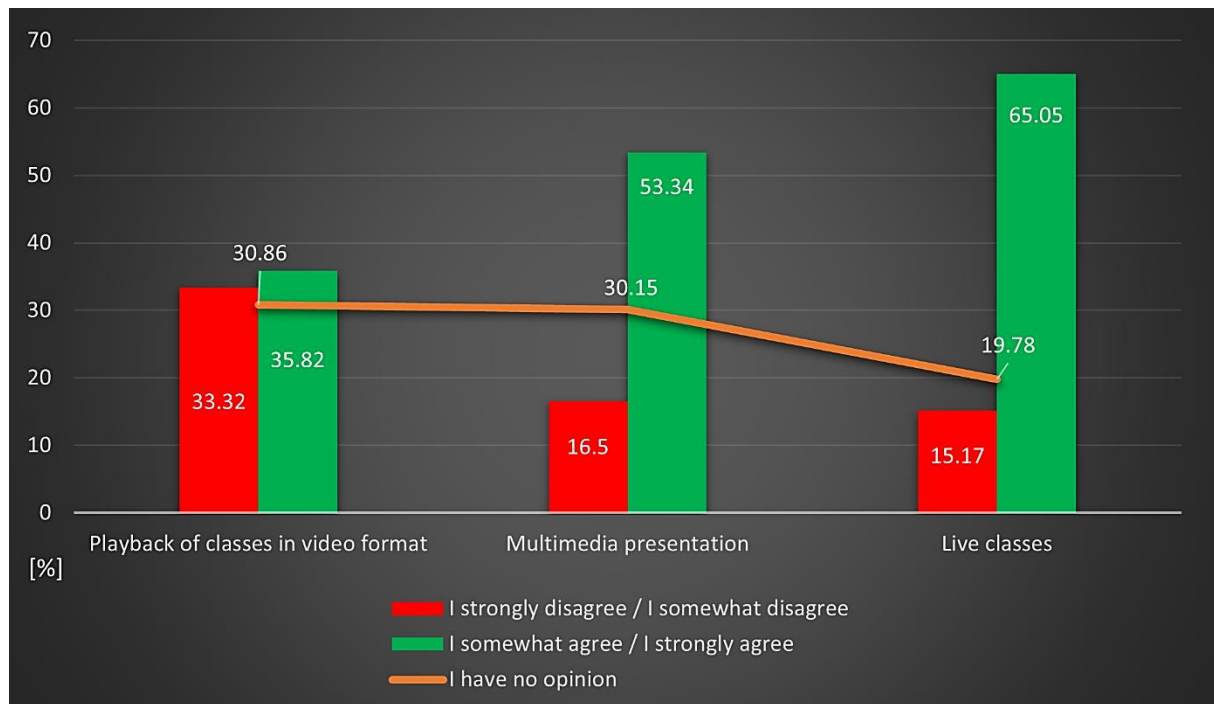


Figure 7. Selected and preferred methods of instructional work used in distance teaching.

Source: own work based on conducted research.

All teachers, regardless of the type of school, overwhelmingly prefer live classes (60-70%). Distance learning is a didactic challenge, so it is more difficult for teachers to evaluate students or organise teamwork. Elements of the educational process conditions such as efficiency of knowledge acquisition, learning independence and student concentration were rated negatively by the respondents.

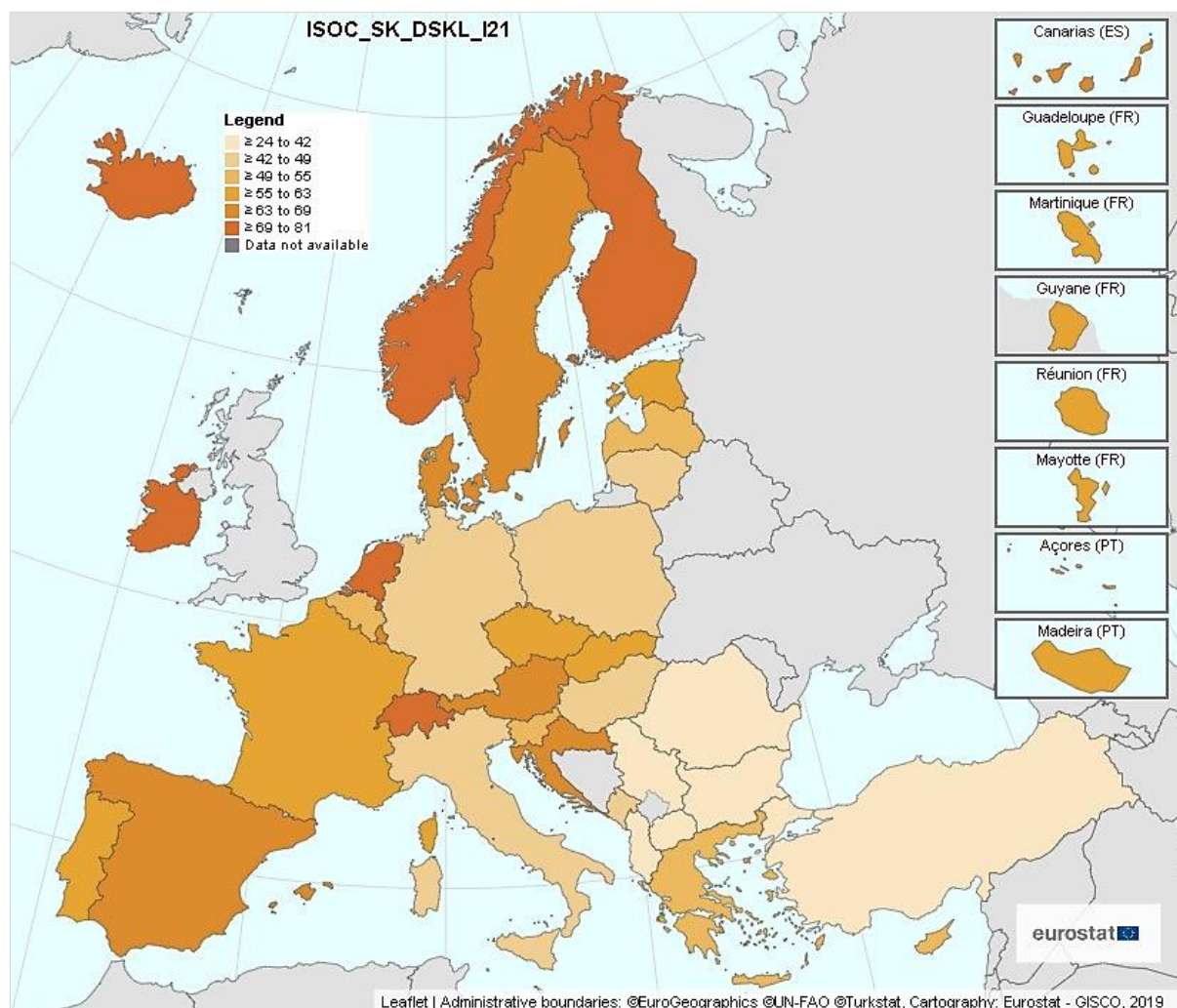
5. Summary

In the current conditions, it is necessary to focus efforts on development of remote education in order to practise distance learning under optimal conditions but we must not forget that the level of economic development varies from country to country, from area to area, and the development of distance education may face a number of constraints (personal, pedagogical, technical, financial and organisational) (Bashitialshaer, Alhendawi, Lassoued, 2021).

Nowadays, digital education action plans and distance teaching development programmes have been developed in many countries around the world to allow experimentation with the manner in which information is presented and interaction options. For example, at EU level, The Digital Education Action Plan (DEAP) 2021-2027 has been developed, offering a strategic vision for high quality, inclusive and accessible European digital education. DEAP priorities are promoting the development of a high-performance digital education ecosystem and

improving digital skills and competences for digital transformation (Digital Education Action Plan (2021-2027), 2020).

According to information provided by Eurostat, in 2021 54% of EU citizens aged 16 to 74 possessed basic digital skills. The EU countries recording the highest percentage of persons with basic digital skills are the Netherlands and Finland (79% each) and Ireland (70%), with Romania (28%), Bulgaria (31%) and Poland (43%) at the other end of the ranking (Eurostat. Individuals' level of digital skills, 2021) (Figure 8).



Note: Overall digital skills refer to five areas: information and data literacy skills, communication and collaboration skills, digital content creation skills, safety skills and problem-solving skills. To have at least basic overall digital skills, people must know how to do at least one activity related to each area.

Figure 8. People with basic or above basic overall digital skills in 2021 (% of people aged 16-74).

Source: Eurostat. Individuals' level of digital skills (from 2021 onwards), 28 September 2023.

Due to the pandemic and the measures adopted to continue instructional activities, many young people and teachers took online courses, which forced them to use and even improve their digital skills. Thus, in 2021, according to Eurostat, in the EU 71% of young people aged 16 to 24 had basic or greater digital skills, which is 17% higher than among those aged 16 to 74 (54%) (How many citizens had basic digital skills in 2021?, 2022).

Among EU Member States in 2021, Finland and Malta had the highest proportions of 16 to 24-year-olds with basic or greater general digital skills (93%), followed by Croatia and Greece (88%), and Portugal (86%). The lowest percentages were recorded in Romania (47%) and Bulgaria (51%) (How many citizens had basic digital skills in 2021?, 2022).

There are differences at EU level in terms of possession of digital skills, analysed by gender, place of residence, level of education, living in a household with or without children. The gap between men and women is small, with 56% of men and 52% of women in the EU having digital skills. The percentage of those living in cities and having digital skills is 61%, those living in cities and suburbs – 52% and those living in rural areas – 46%. Significant differences are noted in relation to education level, with 79% of those with high-level formal education being digitally competent, those with moderate-level formal education at 58% and those with no or low-level formal education at 32%. Those living in a household with children and having digital skills achieved a share of 62%, while those living in a household without children achieved a share of 51%.

Digital skills indicators are some of the key performance indicators of Digital Decade, established by the EU's vision of digital transformation. By 2030, the Digital Compass has set a goal – 80% of EU citizens aged 16 to 74 to have basic digital skills.

Remote education can be a way to move towards digitalisation, and digitisation of education, and therefore development of the education system and the digital skills of graduates, in order to meet current labour market requirements.

Based on this study, it can be concluded that more than 50% of teachers recognise the importance of the potential of distance teaching in the education of students. Less than 10% of teachers fully recognise the possibility of replacing traditional classes with remote classes. However, significantly, more than 50% of teachers see the possibility of teaching 20% of classes remotely. Among the methods and forms of instructional work in remote form, multimedia presentations were preferred by more than 50% of the teachers, and 33% pointed to the playback of classes in video format. All teachers, regardless of the type of school, overwhelmingly preferred conducting live classes (60-70%). In the opinion of about 50% of teachers, the greatest prospects for using distance teaching in the current instructional process concern both support for additional classes and individual instruction. The participation of specialists in remote classes is appreciated by about 40% of teachers, and their participation in meetings between pedagogues and parents – by nearly 30%. The survey showed that in each of the surveyed aspects, about 30% of teachers had no opinion, which may be due to a lack of knowledge about the possibilities of using remote teaching. In the context of the conducted research, it may be considered justified to study the effectiveness of remote education and to try to develop a system for evaluating the quality of remote education in schools.

The pandemic situation may have an impact on the evaluation of distance teaching and therefore may be a determining factor. The study showed that it is not possible to clearly assess whether distance teaching is a good or bad alternative to standard classes. Among teachers,

there is a predominance of those who positively evaluate distance teaching as an alternative to traditional classes. As many research findings indicate, distance teaching is a didactic challenge, as it is more difficult for teachers to both evaluate students and organise teamwork. Important elements of the conditions of the remote education process, such as the efficiency of knowledge acquisition, learning independence and student concentration are evaluated negatively in the opinion of teachers.

Considering the process of preparing national and regional education strategies, it is necessary to take into account simultaneous development of an appropriate programme for the development of educational policy, which in its implementation will ensure that systemic measures are taken, guaranteeing effectiveness of the educational process in schools of all types. It is certainly also necessary to give consideration to development of the most pessimistic scenarios, assuming that classes will be conducted only in this form. It is advisable to define procedures for the occurrence of emergency situations, where the process of distance teaching will be necessary. However, it is also advisable to implement scenarios in which distance teaching is part of and complementary to, and thus can enhance the quality of, traditional education.

References

1. *2021 Impact Report. Serving the world through learning* (2021). Coursera. Retrieved from: <https://about.coursera.org/press/wp-content/uploads/2021/11/2021-Coursera-Impact-Report.pdf>
2. Abdallah, N., Abdallah, O. (2022). Investigating Factors Affecting Students' Satisfaction with E-learning: An Empirical Case Study. *Journal of Educators Online*, 19(1).
3. Al-Saleh, B.A. (2013). Critical Issues in E-Learning Distance Education Model. *Proceedings of the Third International Conference for e-Learning via Distance Learning*. Riyadh, Saudi Arabia, pp. 4-7.
4. Amira, J., Tarshoun, O., Olayan, A. (2019). Characteristics and objectives of distance education and e-learning: a comparative study on the experiences of some Arab countries. *The Arab Journal of Literature and Human Studies*, 6, 298-285.
5. Andronic, R.-L. et al. (2012). Opinions about Distance Learning in Romania – A Comparative Research. *Procedia - Social and Behavioral Sciences*, 69, pp. 2151-2155. Retrieved from: <https://doi.org/10.1016/j.sbspro.2012.12.180>.
6. Apaydin, Ç., Kaya, F. (2020). An Analysis of the Preschool Teachers' Views on Alpha Generation. *European Journal of Education Studies* [Preprint]. Retrieved from: <http://oapub.org/edu/index.php/ejes/article/view/2815>

7. Barış, M.F., Çankaya, P. (2016). Opinions of academic staff about distance education. *International Journal of Human Sciences*, 13(1), pp. 399-413.
8. Bashitialshaaer, R., Alhendawi, M., Lassoued, Z. (2021). Obstacle Comparisons to Achieving Distance Learning and Applying Electronic Exams during COVID-19 Pandemic. *Symmetry*, 13(1), p. 99. Retrieved from: <https://doi.org/10.3390/sym13010099>
9. Boronina, L., Baliarov, A., Sholina, I. (2021). Features Of Educational And Professional Attitudes Of Technical Training Areas Students In The Context Of The COVID-19 Pandemic. *ICERI 2021 Proceedings*, pp. 8651-8657. Retrieved from: <https://doi.org/10.21125/iceri.2021.1994>
10. Burdina, G.M., Krapotkina, I.E., Nasyrova, L.G. (2019). Distance learning in elementary school classrooms: An emerging framework for contemporary practice. *International Journal Of Instruction*, 12(1), pp. 1-16. Retrieved from: <https://doi.org/10.29333/iji.2019.1211a>
11. Bušelić, M. (2012). Distance Learning—concepts and contributions. *Oeconomica Jadertina*, 2(1), pp. 23-34. Retrieved from: <https://doi.org/10.15291/oec.209>
12. Çalış Duman, M., Aksoğan, M. (2020). A Research on Academician Opinions on Distance Education in the COVID-19 Process. *NATURENGS MTU Journal of Engineering and Natural Sciences, Malatya Turgut Ozal University, Special Issue*, pp. 38-49. Retrieved from: <https://doi.org/10.46572/nat.2020.10>
13. Carpinelli, J. et al. (2006). *Factors affecting student performance and satisfaction in distance learning courses*. ASEE Annual Conference and Exposition. American Society for Engineering Education, p. 11.631.1.
14. Definition of distance learning (2004). United States Distance Learning Association (USDLA). Retrieved from: <http://www.usdla.org>
15. Diana, N., Suhendra, S., Yohannes, Y. (2020). *Teachers' Difficulties in Implementing Distance Learning during Covid-19 Pandemic*. ICETC'20: 2020 12th International Conference on Education Technology and Computers. London, United Kingdom: ACM, pp. 105-109. Retrieved from: <https://doi.org/10.1145/3436756.3437029>
16. Dietrich, N. et al. (2020). Attempts, Successes, and Failures of Distance Learning in the Time of COVID-19. *Journal of Chemical Education*, 97(9), pp. 2448-2457. Retrieved from: <https://doi.org/10.1021/acs.jchemed.0c00717>
17. *Digital Education Action Plan (2021-2027)*. European Education Area (2020). Retrieved from: <https://education.ec.europa.eu/focus-topics/digital-education/action-plan>
18. Dimock, M. (2019). Defining generations: Where Millennials end and Generation Z begins. Retrieved from: <https://www.pewresearch.org/short-reads/2019/01/17/where-millennials-end-and-generation-z-begins/>
19. Domagała-Zyśk, E. (2020). *Zdalne uczenie się i nauczanie a specjalne potrzeby edukacyjne. Z doświadczeń pandemii COVID-19*. Episteme. Retrieved from:

- https://depot.ceon.pl/bitstream/handle/123456789/19918/Zdalne_uczenie_si%20repozytorium.pdf?sequence=1.
20. Düzgün, S., Sulak, S.E. (2020). Öğretmen Adaylarının COVID-19 Pandemisi Sürecinde Uzaktan Eğitim Uygulamalarına İlişkin Görüşleri. *Milli Eğitim Dergisi*, 49(1), pp. 619-633.
 21. El Refae, G.A., Kaba, A., Eletter, S. (2021). Distance learning during COVID-19 pandemic: satisfaction, opportunities and challenges as perceived by faculty members and students. *Interactive Technology and Smart Education*, 18(3), pp. 298-318.
 22. Erdoğan, D.G., Ayanoğlu, Ç. (2021). Teachers' views regarding the implementation of education programs in distance education through the EBA platform during the Covid-19 pandemic. *Eğitimde Nitel Araştırmalar Dergisi*, 28, pp. 100-128.
 23. Eurostat. *Individuals' level of digital skills (from 2021 onwards)*. Retrieved from: https://ec.europa.eu/eurostat/databrowser/view/ISOC_SK_DSKL_I21__custom_5695862/bookmark/table?lang=en&bookmarkId=78de5a9a-374c-45ba-a9ca-618d66504bff
 24. Ferraro, F.V. et al. (2020). Distance Learning in the COVID-19 Era: Perceptions in Southern Italy. *Education Sciences*, 10(12), p. 355. Retrieved from: <https://doi.org/10.3390/educsci10120355>
 25. Gaol, F.L., Hutagalung, F.D. (eds.) (2017). *Social Interactions and Networking in Cyber Society*. Singapore: Springer Singapore. Retrieved from: <https://doi.org/10.1007/978-981-10-4190-7>
 26. Gayvoronskiy, V.G. (2020). The Teachers' opinion on Efficiency of Distance Education. *Bulletin of Nizhnevartovsk State University*, 3, pp. 11-17.
 27. *Generations in Higher Ed.* (2018). Retrieved from: <https://www.purdue.edu/vpsl/resources/generations.php>
 28. Gursoy, D., Chi, C.G.-Q., Karadag, E. (2013). Generational differences in work values and attitudes among frontline and service contact employees. *International Journal of Hospitality Management*, 32, pp. 40-48. Retrieved from: <https://doi.org/10.1016/j.ijhm.2012.04.002>.
 29. Hayes, J.B. et al. (2018). Boomers to Millennials: Generational Stereotypes at Work in Academic Librarianship. *The Journal of Academic Librarianship*, 44(6), pp. 845-853. Retrieved from: <https://doi.org/10.1016/j.acalib.2018.09.011>
 30. Holmberg, B. (1977). 'Distance Education: A Survey and Bibliography.' Retrieved from <https://eric.ed.gov/?id=ED157485>
 31. How many citizens had basic digital skills in 2021? (2022). Retrieved from: <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220330-1>
 32. Huda, M. et al. (2017). Empowering children with adaptive technology skills: Careful engagement in the digital information age. *International Electronic Journal of Elementary Education*, 9(3), pp. 693-708.
 33. Ismail, S., Nazeri, M.I.H.M., Mohamad, S.F.S. (2021). The Impact of Covid-19 on Online Teaching and Learning (TnL) Towards Teachers in Malaysia. *Malaysian Journal of*

- Science, Health & Technology (MJoSHT)* [Preprint]. Retrieved from: <https://oarep.usim.edu.my/jspui/handle/123456789/19254>
34. Karakas, F., Manisaligil, A., Sarigollu, E. (2015). Management learning at the speed of life: Designing reflective, creative, and collaborative spaces for millennials. *The International Journal of Management Education*, 13(3), pp. 237-248.
 35. Karakoyun, F., Kavak, M.T. (2009). The opinions of academicians regarding distance learning: a sample of Dicle University. *Procedia - Social and Behavioral Sciences*, 1(1), pp. 1172-1176. Retrieved from: <https://doi.org/10.1016/j.sbspro.2009.01.211>
 36. Kochan, I. (2020). Nauczanie zdalne w opinii uczniów szkół średnich w czasie trwania pandemii COVID-19. *Studia edukacyjne*, 59, pp. 119-132.
 37. Kochan, I. (2021). Distance learning in Polish secondary schools: Students' opinions during the Covid-19 pandemic. *Journal of Contemporary Educational Studies/Sodobna Pedagogika*, 72(138), pp. 342-353.
 38. Leslie, B. et al. (2021). Generation Z Perceptions of a Positive Workplace Environment. *Employee Responsibilities and Rights Journal*, 33(3), pp. 171-187. Retrieved from: <https://doi.org/10.1007/s10672-021-09366-2>
 39. Marek, M.W., Chew, C.S., Wu, W.V. (2021). Teacher experiences in converting classes to distance learning in the COVID-19 pandemic. *International Journal of Distance Education Technologies (IJDET)*, 19(1), pp. 89-109.
 40. Moore, J.L., Dickson-Deane, C., Galyen, K. (2011). e-Learning, online learning, and distance learning environments: Are they the same? *The Internet and higher education*, 14(2), pp. 129-135.
 41. Ng, W. (2011). Why digital literacy is important for science teaching and learning. *Teaching Science*, 57(4), pp. 26-32.
 42. Oliver, K. et al. (2010). Needs of elementary and middle school teachers developing online courses for a virtual school. *Distance Education*, 31(1), pp. 55-75. Retrieved from: <https://doi.org/10.1080/01587911003725022>
 43. Petek, T. (2021). The opinion of Slovene (mother tongue) teachers on distance learning in primary schools. *CEPS Journal*, 11(Special Issue), pp. 383i-406.
 44. Picca, M. et al. (2021). Distance learning, technological devices, lifestyle and behavior of children and their family during the COVID-19 lockdown in Lombardy: a survey. *Italian Journal of Pediatrics*, 47(1), p. 203. Retrieved from: <https://doi.org/10.1186/s13052-021-01156-8>
 45. Poláková, P., Klímová, B. (2021). The Perception of Slovak Students on Distance Online Learning in the Time of Coronavirus—A Preliminary Study. *Education Sciences*, 11(2), p. 81. Retrieved from: <https://doi.org/10.3390/educsci11020081>
 46. Porozovs, J., Valdemiers, A. (2019). *Assessing the opinions of pedagogical specialities students on the use of distance learning*. Human, Technologies and Quality of Education.

- 76th Annual International Conference of the University of Latvia. University of Latvia, pp. 55-66. Retrieved from: <https://doi.org/10.22364/htqe.2018.06>
47. Psychogyiou, A., Karasimos, A. (2019). The effectiveness of learning a foreign language via a distance learning tool: Testing the Duolingo application. *Selected papers on theoretical and applied linguistics*, 23, pp. 364-380.
 48. Rahmadi, I.F. (2021). Teachers' technology Integration And Distance Learning Adoption Amidst The COVID-19 Crisis: A Reflection For The Optimistic Future. *Turkish Online Journal of Distance Education*, 22(2), pp. 26-41.
 49. Rammert, W. (1996). Computer Use at Home — A Cultural Challenge to Technology Development. in: W. Brenner, L. Kolbe (eds.), *The Information Superhighway and Private Households*. Heidelberg: Physica-Verlag HD, pp. 399-408. Retrieved from: https://doi.org/10.1007/978-3-642-48423-0_33
 50. dos Reis, T.A. (2018). Study on the alpha generation and the reflections of its behavior in the organizational environment. *Journal of research in humanities and social science*, 6(1), pp. 9-19.
 51. Rizwan, M., Iftikhar, I. (2019). Factors affecting student satisfaction in distance learning: A case study. *The Journal of Educational Paradigms*, 1(2), pp. 50-56.
 52. Salasan, C. et al. (2021). Agriculture Knowledge Transfer And Delivery Supported By Digital Technologies For Remote Learning And Problem Solving. *Scientific Journal-Agricultural Economics*, 12, pp. 11-17.
 53. Sałatarow, A. (2020). Nauczanie zdalne–wyzwanie dla edukacji nie tylko w czasie pandemii. *Polonistyka. Innowacje*, 12, pp. 175-184.
 54. Singh, V. and Thurman, A. (2019). How Many Ways Can We Define Online Learning? A Systematic Literature Review of Definitions of Online Learning (1988-2018). *American Journal of Distance Education*, 33(4), pp. 289-306. Retrieved from: <https://doi.org/10.1080/08923647.2019.1663082>
 55. Solpuk Turhan, N. (2019). *Comparing university student satisfaction with distance education*. Proceedings of the Multidisciplinary Academic Conference, pp. 37-41. Retrieved from: <https://doi.org/10.3390/su15107969>
 56. Toader, C.-S. et al. (2023). Exploring Students' Opinion towards Integration of Learning Games in Higher Education Subjects and Improved Soft Skills—A Comparative Study in Poland and Romania. *Sustainability*, 15(10), p. 7969.
 57. Toader, C.S., Licaj, B. (2021). Challenges of online classes for students and teachers in tourism Higher Education in COVID-19 pandemic context. Study case Albania and Romania. *Lucrări Științifice Management Agricol*, 22(3), p. 127.
 58. Todri, A. et al. (2020). Perceptions regarding distance learning in higher education, smoothing the transition. *Contemporary Educational Technology*, 13(1), p. 287.
 59. Traxler, J. (2018). Distance Learning—Predictions and Possibilities. *Education Sciences*, 8(1), p. 35. Retrieved from: <https://doi.org/10.3390/educsci8010035>

60. Türkan, A., Leblebici, H. and Önal, I. (2020). Opinions of Teacher Candidates on Distance Education Implemented during the COVID-19 Pandemic Period. *Online Submission*, 7(11), pp. 329-353.
61. Urlica, A.-A. et al. (2021). Is Virtual Education A Sustainable Option: Insights From Online Communication Classes. *Research Journal of Agricultural Science*, 53(2). Retrieved from: https://www.rjas.ro/download/paper_version.paper_file.8552a97fa1ef5c26.447261676f657363755f55726c6963612e706466.pdf
62. Weltrowska, J. et al. (2022). Zalety i wady nauczania zdalnego w czasie pandemii COVID-19 w opinii nauczycieli szkół w województwie wielkopolskim. *Czasopismo Geograficzne*, 93(1), pp. 161-178. Retrieved from: <https://doi.org/10.12657/czageo-93-07>
63. Winiarczyk, A., Warzocha, T. (2021). Edukacja zdalna w czasach pandemii COVID-19. In: *Forum Oświatowe*. University of Lower Silesia, pp. 61-76. Retrieved from: <https://www.forumoswiatowe.pl/index.php/czasopismo/article/view/792>
64. Zajdel, M. et al. (2021). Conditions and Determinants of Distance Education for Students during the COVID-19 Pandemic—Evaluation in the Kuyavia-Pomerania Region in Poland. *Sustainability*, 13(18), p. 10373. <https://doi.org/10.3390/su131810373>
65. Васильченко, Л.В., Шацька, Н.М. (2021). Досвід реалізації дистанційного навчання в умовах пандемії. *Електронне наукове фахове видання. Відкрите Освітнє Е-Середовище Сучасного Університету*, 10, pp. 43-55.