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Digital transformation of vocational schools: problem analysis

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Abstract. Modern society is characterized by a significant impact of information technologies on all spheres of human life. In a special way, the processes of digital transformation affect educational institutions, including vocational (vocational and technical) ones. Now vocational (vocational and technical) education occupies an important place in the sector of the country's economy, prioritizing effective training of highly qualified labourers in the state policy of Ukraine. Nowadays, the professional activity of labourers incorporates an intellectual component related to working with electronic devices, artificial intelligence systems, etc. Monitoring of the labor market shows that a skilled worker of the XXI century should be able to think critically, process information analytically, and work with mechatronics systems. The analysis of the European experience in training qualified workers reflects a certain lag of domestic institutions in terms of digital supply. At the same time, the level of teachers' digital competence at vocational (vocational and technical) education institutions needs improving. As a result, the issues of digital transformation for educational institutions are urgent and topical. Provision of modern digital equipment, formation and development of digital competence of all participants in the educational space are becoming the main tasks of teaching stuff in the current conditions. In a special way, the tasks set become relevant during the period of quarantine restrictions, when educational institutions mainly work on distance and mixed forms of teaching.

Keywords: education, vocational training, digital transformation, digital technologies, key competencies, distance learning

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1. Introduction

Modern society is characterized by a significant impact of digital technologies on all spheres of human life. According to research conducted by Gartner analysts, by the end of 2021, the number of digital devices in the world will have reached 6.22 billion units, including more than 4.3 billion smartphones, 495 million desktops, 866 million laptops and 535 million tablets [16]. Now the number of the Internet users is also rapidly increasing. So, according to the statistics, now the Internet is used by more than 60% of world's population, which is more than 4.5 billion people [7]. The process of digitalization is inexorable, and has touched the educational domain to such an extent that now it seems impossible to facilitate the modern teaching process without any digital devices.

The use of innovative forms, teaching methods, and the latest pedagogical technologies determines the improvement of the quality of education and is an important tool in the process of forming key, subject, and professional competencies of vocational school students. At the same time, digitalization of education has become a priority of its development, which is stipulated by both globalization processes and the spread of coronavirus infection COVID-19, and, as a result, the transfer of the educational process to distance and mixed forms of learning [3, 28].

1.1. Theoretical background

The use of digital technologies in education has greatly influenced its forms and methods, since they have changed the way people communicate ideas, learn and work. Still, digitalization of all social spheres, including educational is a new phenomenon and requires new knowledge and skills to master different digital activities for various purposes. Since our research deals with digitalization of education at vocational schools (VS), the participants of it VS teachers and students are representatives of different generations who have different experiences of digital teaching-learning [30].

In [27] shown the ways digital technologies can enhance learning outcomes, students learning skills, their motivation to solve problems, thus making them more responsible for the outcome of their study, develop their team-working skills etc. Thus, embedding digital technologies in the curriculum is an important step to educational improvements.

Leshchenko et al. [10], Morze and Strutynska [14], Pinchuk et al. [19], Siemens [26], Trcek [29] emphasized the need of digital transformations in education due to complex societal changes and globalization processes, raising students' need for corresponding skills to enter a global labour market.

Windham [31] studies the influence of informational technologies on the new generation, calling them Net Geners, because they grow up together with Web, prioritize technological understanding for future achievements. This idea is also reinforced by curricula, that offer special subjects for digital literacy and the whole range of digital devices students use for study, browsing information and communication.

McLoughlin and Lee [11] address the problems of the gap between the generation of digital students and teachers, as well as implications of digital education. They argue that digital education raises students' participation and collaboration as well as independence in the learning

process, which should be taken as a new starting point for changes.

Siemens [26] also sticks to the opinion that changes in the education are necessary and are caused by the discrepancy of teachers' and students' digital background. He says that educational establishments should undergo changes to accommodate the mode of learning and teaching and prepare student for active participation in the constantly changing world. He emphasizes the necessity for the students to be ready to work in the conditions of labour force mobility and lifelong learning to be able to change career paths in future.

Mentis [12] considers the digital literacy from a teacher-teacher perspective and shows that also teachers have different digital background and can perform their assignments differently with unequal performance opportunities to which refer their education, their current work and personal conditions. It means, that even seemingly the same digital tools in the hands of different participants can have different performance results and the need for seeking ways for its improvement will always exist.

In this respect, interesting is the research by Salajan, Schönwetter and Cleghorn [25], who on the basis of the survey of both students and teachers of dentistry faculty on their feedback about applying digital technologies for educational purposes, suggested, that students admitted to be proficient in using digital technologies for study, while teachers felt less confident in coping with them.

1.2. Problem statement

Vocational education (VE) is an inseparable and significant part of educational domain which is also an important stage to higher education but also supplies the labour market with qualified workers. According to the Ministry of education and science of Ukraine, as of 01.01.2021, 239.8 thousand students received professional education at 708 domestic VS [21]. However, despite a large number of VS, in general, there is a problem of non-compliance of professional training of their graduates with the needs of employers, economy and society. Also, the Concept of implementation of the state policy in the sphere of vocational education "Modern vocational education" for the period up to 2027, emphasizes that the problem of non-compliance of training of future skilled workers in the VS to the needs of the labor market also manifests itself in "non-compliance of the content of education and teaching methods with the requirements of the modern labor market and the needs of the individual" [17]. That is why, starting from 2019, the professional education system is undergoing a number of reforms aimed at improving its quality and, accordingly, providing the labor market with highly qualified workers. One of the directions of reform is the digitalization of the educational process.

Since the center of any educational process is a student, all changes and reforms in this system have always been made with respect of its optimization, accessibility and enhancing knowledge. At the same time, digital technologies are the most rapidly developed and expensive ones. This arouses the following issues to address:

1) the ability of its participants (teachers and students) to maintain a digital education process effectively;
2) ensuring the feasibility of this process through available digital tools.

Although qualitative approaches can provide valuable information for improving education,

there are limited qualitative studies related to technology use in vocational education. The research is aimed to study the problems of digital transformations of vocational schools of Ukraine, ways of enhancing digital literacy of all the participants of the educational process and define the changes to be done for the effectiveness of this process.

1.3. Methods

The article is based on the following methods: theoretical method of analysis and synthesis of the latest research on the issue of applying digital technologies in the educational process, which enabled to single out the main problems of digitalization of education at a current stage and the vectors of its improvement. The statistical analysis of digital equipment and software supply of vocational schools of Vinnytsia, Khmelnytskiy, Kyiv and Sumy regions was conducted to define the problems hindering the effectiveness of digitalization of education at the current stage. The received data included questionnaires, classroom observations, opinion surveys and were interpreted using the main theses of the competence-based approach, systemic, synthetic methods to explore the students' and teachers' perception of the problem and their experience of using digital technologies for educational purposes.

2. Results and discussion

"Today's system of education and science must undergo dramatic digital changes to meet global trends in digital development so that each person could successfully realize his/her potential" [27]. This particularly applies to VS, since a large number of craft professions are associated with the use of digital technologies. For example, these are professions of transport (car computer diagnostics), agricultural sphere (tractors, combine harvesters equipped with digital harvesting systems), public catering (working with cash registers, R-Keeper systems), tourism industry (processing electronic sources of information, providing electronic services for tourism), etc. On the one hand, in order to ensure the quality of educational services, VS teachers must acquire soft skills (ability to work with digital resources during their lessons), on the other – be able to use digital technologies in the context of professional activities of future skilled workers. Moreover, the latter applies not only to teachers of special disciplines or masters of industrial training, but also to all teachers working in groups of the corresponding direction. This is due to the integrity and dynamism of the educational process. For example, when studying the subject "Information Technologies" future mechanicals specializing in repair of wheeled vehicles, must perform laboratory and practical work on the topics "Work with programs for diagnosing engines (electrical equipment, transmission, undercarriage of a car, car control mechanism, additional and special car systems)".

In most research digitalization of education is referred as implementation of digital technologies in the educational process. If educational technology is seen as a broad concept incorporating pedagogical, educational and informational communicative technologies, then they must conform to the requirements to the technological process and be systematic, effective, optimal, predicted and reproducible [32].

Authors of [23] also refers to digital technology as educational one being "the study and ethical practice of facilitating learning and improving performance by creating, using, and

managing appropriate technological processes and resources".

Suffice it to note that lately, in conditions of the quarantine, traditional classrooms have shifted to students' and teachers' homes, blurring the border between a study and a private space. Therefore, when we speak about digitalization of education, we also refer to its presence in our private life, partially due to learning from home which digital technologies facilitate [30]. Here, we should not forget that learning from home and teaching from home have a lot of so called technical similarities, the role of students and teachers are still different.

The previous research shows, that incorporating digital technologies at the educational process will make it more inclusive both for students and teachers. She argues that digital technologies enabled both parties to be "consumers and producers of information" [4]. Sadik [24] also emphasizes greater participatory practices through greater students' involvement in their own learning.

However, some scientists argue soundly that there exists a significant discrepancy between the teachers' and students' digital skills that brings them to different levels of performance. This idea was first proposed by Prensky [20], who calls the modern generation of students "digital natives", since they were born at the digital age and have been dealing with digital technologies since their early childhood, while teachers have obtained this knowledge much later, thus are "digital immigrants". Therefore, teaching digital natives requires a lot of changes.

Palfrey and Gasser [18] suggest, that conventional education methods and forms may become so much outdated that it will become difficult to approach students with their totally new mode of thinking and learning. So, the main concern of modern teachers is to acquire necessary knowledge and skills to keep up with digitalized world and thus education. Although stakeholders of this process are both students and teachers, the last have a challenging task to implement digital transformations in the educational process and to make it beneficiary for both parties.

Taking into consideration this binary challenge, it is important to emphasize the importance of teachers' digital literacy. A modern teacher should be able to create presentations, maintain websites, blogs, and communicate with all participants in the educational process online, which requires a high level of information literacy and digital competence.

The research shows that students also have a different digital experience, therefore it is necessary to make sure that both participants of this digital educational process (teachers and students) have the similar level of digital literacy to cope with the tasks and challenges of this process.

The above mentioned "Draft Concept of digital transformation of education and science up to 2026" outlines the problems of transformation of the educational and scientific domain that call for immediate solutions. Taking into account the specifics of vocational schools, we have identified the main problems of their digital transformation. To them refer:

1) the outdated database of digital equipment (in some cases – missing or insufficient);
2) mostly low level of digital competencies of all participants in the educational process;
3) lack of a high-quality digital educational environment.

Suffice it to note that the outdated base of digital equipment (and its lack or shortage) also refers to educational establishments of all levels. Figure 1 indicates, that this issue is in

suspension and little is done for its realization and necessary software for optimization of cooperation only 33% of respondents admitted to having special software and using digital devises for teaching and learning (figure 1).

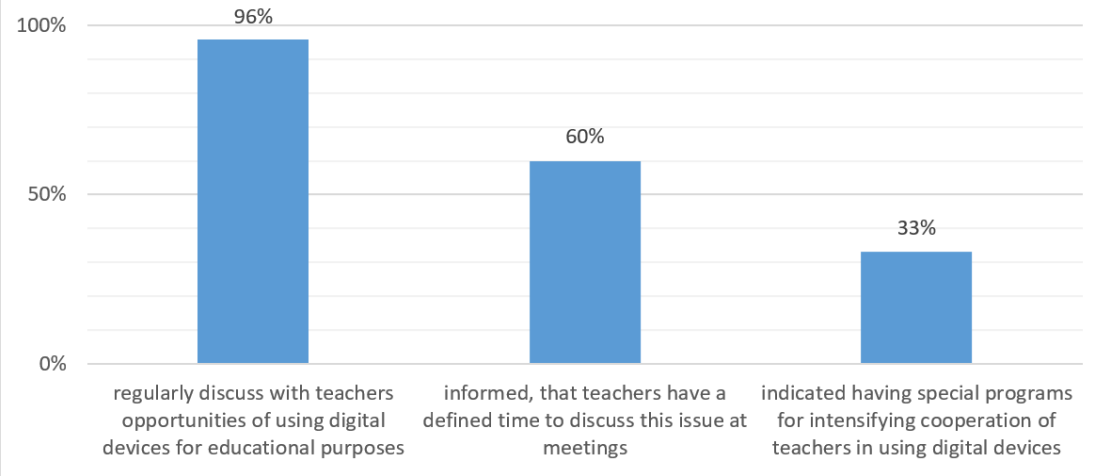

Figure 1: Results of VS principals' survey on teachers' use of digital technologies at lessons (based on materials of [2]).

We have conducted separate studies on the availability of computer equipment at VS in Vinnytsia region. In 28 institutions surveyed, 8 persons share 1 computer. Suffice it to note that the use of computer equipment in (VS) is of priority when studying the subjects "Computer Science", "Information Technologies", as well as when mastering such professions as "Information processing and software operator", "Tourism agent", "Digital book-keeping accountant", "Manager's secretary", etc. However, studying other subjects and mastering other professions, students are also expected to work at the computer. This means that each classroom, as well as the workshop (laboratory) of industrial training, should be provided with computers (laptops) with free access for students.

It goes without saying that the quality of computer equipment (hardware and software) influences the effectiveness of working with it. According to the survey, over the past 5 years, the (VS) of Vinnytsia, Khmelnytsky, Kiev and Sumy regions purchased 36% of the total number of available computers, 64% of printers and multifunction devices. Hardware and software of a digital device are known to be interdependent: when installing software one should follow minimum hardware requirements. In turn, each new version of the operating system requires more powerful hardware. Figure 2 shows the upgrade levels of operating systems (OS) installed on computers in VS of Vinnytsia region.

As we see, only 27% of all computers in VS have a modern OS Windows 10 compatible with modern software, interfaces of the Internet study platforms. We can also notice a tendency of retreat from outdated software, yet it is much unclear taking into consideration these 65% of other OS. In addition, 28% of the surveyed VS teachers in these regions admitted to use their own laptops when conducting lessons for the students of these educational institutions, 45% noted that the equipment they work with needs upgrading, and only 8% of teachers who took

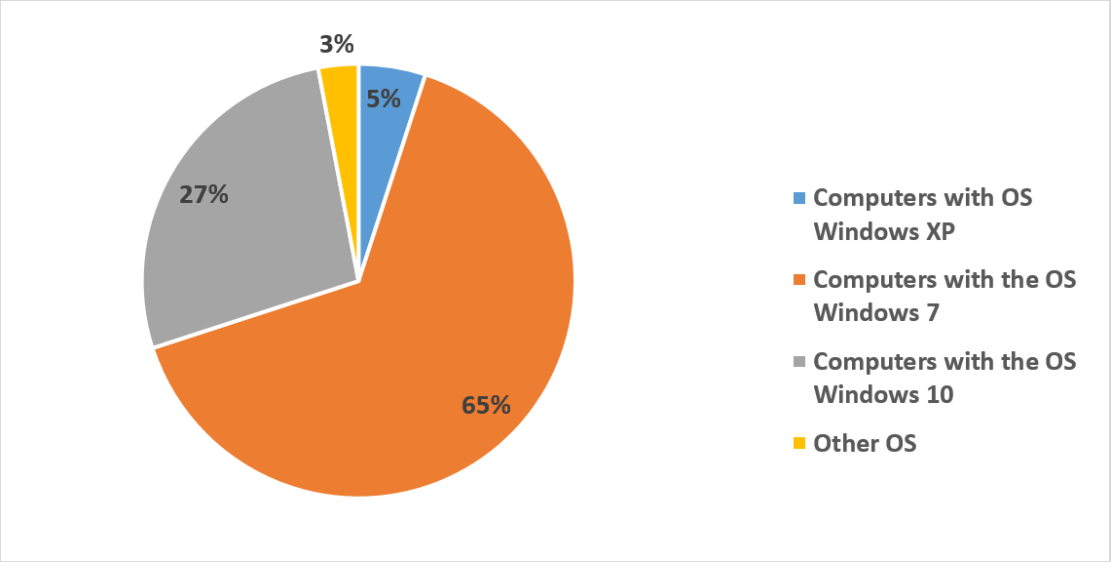

Figure 2: Using OS in VS.

part in the survey noted that they did not have any problems with updating the database of computer equipment.

In a special way, the problem of lacking high-quality computer equipment has worsened during the spread of coronavirus infection COVID-19, when all educational institutions, including VS switched to distance learning. Initially it was a default situation when the educators could not maintain teaching online because of their either low digital literacy or absence of the necessary equipment. This resulted in teachers using their private personal digital devices to maintain the educational process. Moreover, their number had to correspond to the number of all participants in the educational process, which caused complications. Our research among the participants of the educational process – teachers and students of VS in Vinnytsia, Khmelnitsky, Kiev and Sumy regions (1054 people) – indicate that the majority of respondents during quarantine training from home (distant training or mixed forms), had problems with free access to computer equipment, often used mobile devices for work, which were ineffective for performing certain tasks (figure 3).

Here, suffice it to note that one of the obstacles to the high-quality educational process organization in remote and mixed forms was insufficient Internet coverage. Unlike cities where this problem practically does not exist, rural areas faced problems with the Internet access in 54% of the cases, according to students' survey.

Apparently, nowadays, there are many problems in the state regarding the digitalization of the education, which are primarily related to material and technical support. Along the way, we note that this issue is topical for the entire global educational domain, and a large number of countries are working to solve it. The Ukrainian government, the Ministry of education and science of Ukraine, and the executive council bodies are also implementing a number of reforms to overcome existing difficulties in digitalizing the educational sphere.

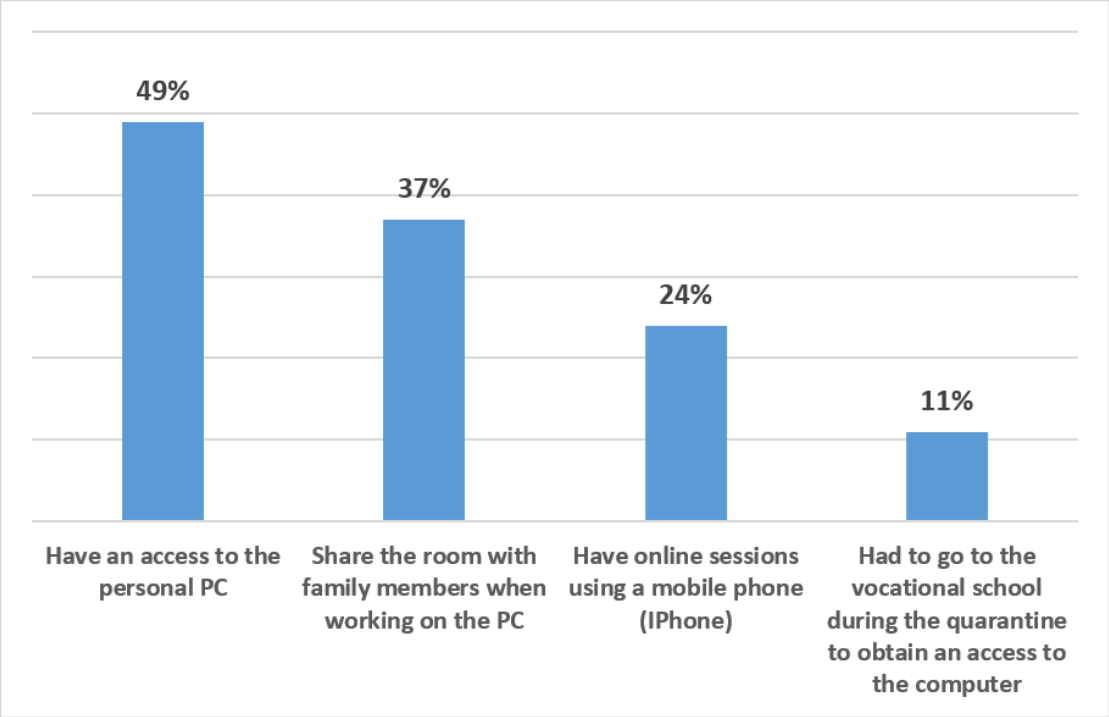

Figure 3: Accessibility of digital devices for students and teachers during the educational process at VS.

Among the measures on improving the quality of educational services while intensifying the material and technical base of VS is the creation of educational and practical centers for modern vocational education (Order No. 846 of the Ministry of education and science of Ukraine dated 26.07.2021). Thus, the creation of educational and practical centers for the profession of "Information and software processing operator" (SVEI "Kozyatyn interregional higher professional school of railway transport", Vinnytsia region, SVEI "Bilotserkivsky professional Lyceum", Kyiv region) provides for a subvention from the state budget for the purchase of digital equipment.

Improving the material base is also possible through participation in grant programs. Since 2006, Vinnytsia region has been exercising a regional program for the development of information and innovative technologies in educational institutions of the region, the purpose of which is to provide monetary remuneration for the purchase of digital equipment. Annually, educational institutions of the region, including VS participate in the contest for the best project in the field of development and application of information and innovative technologies in management activities, educational process and research work. The theme of the submitted projects indicates the motivation of contest participants to the use of digital technologies in educational institutions and the simultaneous possibility of implementing projects both during lessons and in extracurricular activities, which expands the range of using digital equipment (table 1). For example, for the period 2008–2021, through participation in the grant program, the state educational institution "Vinnytsia higher vocational school of the service sector" purchased equipment (computers and multimedia tools) for the sum of 295,000 UAH.

Table 1
Grant awarded projects submitted within the Regional program for the development of information and innovative technologies (Vinnytsia region, 2020–2021).

VS	Topic of the project submitted for the contest	Year
SVEI "Vinnytsia interregional higher professional school"	"Laboratory for network and information security of the training and practical center for modern IT technologies" of the State Technical University "Vinnytsia IHVS"	2020
Higher art vocational school No. 5 in Vinnytsia	"Creation of an educational cluster of 3D modeling of ceramic, wood and metal items"	2020
SVEI "Vinnytsia higher professional school of the service sector"	"Creating an interactive career counseling center"	2020
SEI "Center of vocational education No. 1 in Vinnytsia"	"Deployment of an innovative educational and digital learning environment by the Google G Suite for Education Service System" in the SEI "Center for vocational education No. 1 in Vinnytsia"	2021
SVEI "Vinnytsia interregional higher professional school"	"Video studio of distance education of an institution of professional (vocational and technical) education"	2021
SEI "Brailov vocational lyceum"	"Safety and comfort in the digital environment of a vocational education institution"	2021

The next problem of digital transformation which VS face, is primarily the low level of digital competencies of all participants of the educational process. To define the concept of digital competence, we will use the Framework Program of updated key competencies for lifelong learning, according to which, the concept of key competencies is understood as necessary "for all people to increase personal potential and development, expand employment opportunities, social integration and active citizenship", namely, the concept of "digital competence" is interpreted as "confident, critical and responsible use and interaction with digital technologies for training, professional activities (work) and participation in society" [1]. For clarification, we note that digital competence covers 3 areas of digital technologies use: training, professional activity and participation in the social life.

There exist many mechanisms for determining digital competence. There is the European framework of digital competence of teachers, developed for the teachers to determine their own level of digital knowledge and find out the necessary needs for further improvement. This document contains criteria that enable to determine both the teacher's professional digital competence and that of the student. The Ukrainian platform "Diya", in its turn, contains tests to determine the digital literacy of citizens, among them – "Digital Programs for teachers". In April 2021 the Ministry of education and science launched a project to introduce an online tool called SELFIE for assessing the digitalization state of an educational institution, the level of digital competencies of participants in the educational process. It is clear that in the rapidly digitalizing world, teachers also need to adapt to new realities.

However, the acquisition of new competencies does not only mean mastering new techniques, but also rethinking the traditional idea of the role and tasks of the teacher. He must be open to inevitable changes in modern education for the new generation, as the website of the Media

Center in Baden – Württemberg notes [22].

During this period, in most educational institutions, educational methodology departments developed recommendations for conducting classes using remote technologies and posted them on the websites on the "Methodological room" page.

In addition to methodological assistance, teachers of the VS have completed a large number of trainings, master classes, webinars, etc. on improving the level of digital literacy over the past period (table 2).

Table 2
Special measures taken to improve the level of teachers' digital competence

Institution	Measures
University of Educational Management of the NAES of Ukraine	Special courses: • "Electronic educational platforms for distance learning of general secondary education"; • "Digital remote testing systems"; • "Using Zoom and Google Meet to conduct online classes"; • "G Suite: an effective tool for building the information and educational environment of an educational institution"; • "Features of creating electronic educational resources to maintain the distance educational process"; • "Google services for organizing distance learning"; • "Information culture of the head of a vocational education institution in the era of digitalization"; • "Innovative technologies in informal education as a component of teachers' self-development"; • "Vectors of digitalization of teachers' professional development"; • "Teacher's professional development in an innovative educational environment".
Institute of vocational education of the NAES of Ukraine	Webinars: • "Practice of students' self-organizing independent work"; • "Organization of distance learning by means of LMS Moodle"; • "Creating SMART complexes in the distance learning system"; • "Organization of distance learning in vocational education institutions"; • "Organizational and pedagogical conditions of distance professional training"; • "Teacher's self-educational activity in the context of distance learning"; • "Using mobile applications in distance learning"; • "Organizational and pedagogical conditions for the development of SMART complexes".

A significant contribution to the development of digital competencies of teachers of VS was made by the Ministry of education and science of Ukraine through the implementation of the European program "EU4Skills: the best skills for Modern Ukraine", aimed at implementing

reforms in VS. Within the framework of this program, teachers of pilot institutions had the opportunity to participate in training programs to improve the level of digital competencies.

The transition to distance learning led to updating teachers' needs in mastering software tools, namely, the needs:

1) to conduct training sessions online using programs for organizing video conferences – Zoom, Google Meet, Microsoft Teams, etc.;
2) place and upload training materials in online services (Google Classroom, Microsoft Office 365);
3) maintain educational websites and blogs.

Our research suggests that teachers' digital skills during the quarantine have significantly increased due to 2 factors:

1) the above mentioned measures of raising teachers' digital literacy;
2) teachers' intensive use of digital devices for teaching.

During this period, they mastered the skills of working with Zoom, Google Meet, Microsoft Teams, Google Classroom, etc., as evidenced by the results of our survey. The survey involved 312 teachers of Vinnytsia, Kyiv and Khmelnytsky regions VS – 196 teachers and 116 masters of industrial training (figure 4).

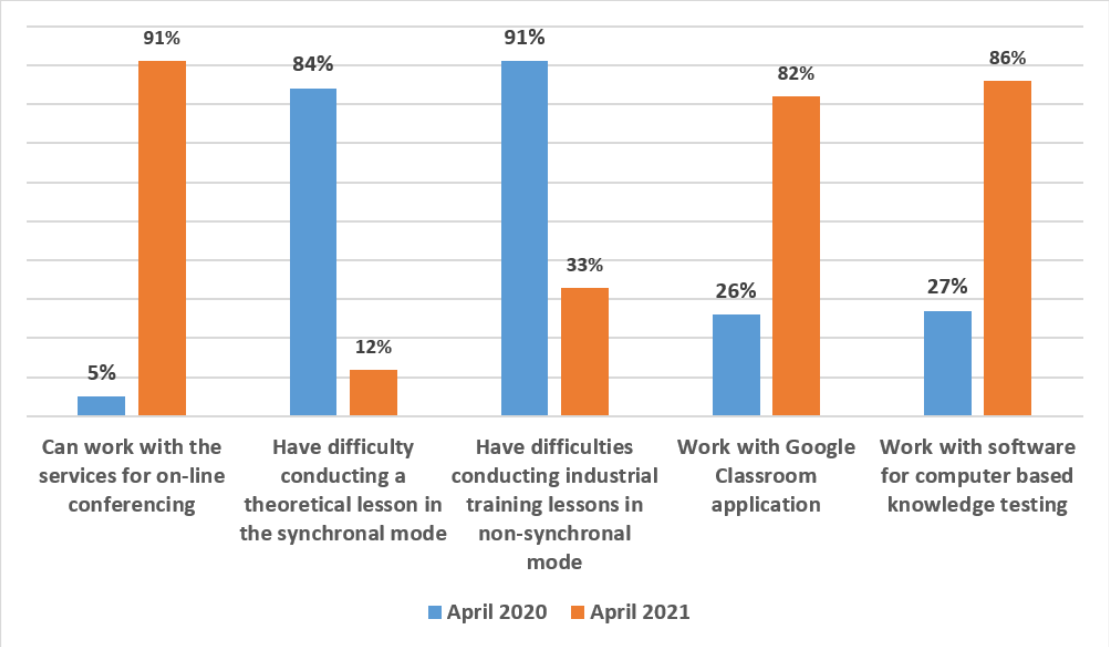

Figure 4: Improvement of VS teachers' software skills of maintaining distant and mixed forms of education (2020–2021).

The research shows, that teachers find a lot of positive aspects of digitalization of education. They can find and share necessary pictures, charts, graphs with students instantaneously,

which saves time for other activities. This cannot be done in the classroom without any Internet access and a computer. Sharing a screen is another advantage, because students can immediately download it and have necessary information close at hand. So, teachers welcomed this opportunity and mastered it envisaging its significant benefits. Another advantage is learning materials and tools accumulation which can be improved in the process and used for the next generation of students. Such activities for teachers of VS, as well as for teachers of other educational institutions, appeared to be new and required enhanced methodological support and urgent professional development.

Returning to the main problems of digital transformation of VS, the third problem is the lack of a high-quality digital educational environment. The analysis of regulatory documents (standards of general secondary, professional (vocational-technical) education) enables to assert that the information and educational environment (digital educational environment) combines a complex of information educational resources, including digital educational resources, a set of technological environments, information and communication technologies, a system of modern pedagogical technologies that provide training in a modern information educational environment.

Rapid development of technology creates new challenges for professional training of skilled workers. For example, nowadays, Germany possesses 309 industrial robots per 10 thousand skilled workers. This means that a specialist working at the relevant enterprise must develop skills in working with automation systems, artificial intelligence, be able to control robotic systems, and have developed technological thinking. And, if not long ago specialists in robotics and artificial intelligence were trained only at higher education institutions, now in the world practice has it a priority of professional education. In this sense, the experience of organizing professional training in Germany draws attention. Such experience testifies to the state's response to professional training of workers in the context of rapid technological development.

One of the most promising professions of our time is mechatronics, a branch of applied robotics science that combines mechanics and electronics. Mechatronic systems are used in various fields: cosmonautics, aviation, mechanical engineering, food processing, etc., and require highly qualified specialists to maintain them. There is no doubt, that mastering mechatronic programs, studying artificial intelligence systems, and robotic devices requires expensive equipment and the formation of appropriate professional skills of teachers and masters of industrial training. An effective method of training in such conditions, as the German experience shows, is dual training. It is the dual form of training that eliminates the problem of non-compliance of training laborers with employer's needs, because the process of professional training takes place directly in production (or in the service sector) with the involvement of specialists in the relevant field in the training process.

Training of future specialists in mechatronics in Germany is carried out by Siemens, and this form of training is part of vocational education in Germany: every year Siemens trains up to 500 thousand skilled workers for the German economy. Simultaneously, students have the opportunity to study on expensive equipment (in Germany, businesses invest up to 50 billion euro per year to train specialists in artificial intelligence and robotics, while at the University of North Carolina, such annual training of one student costs from 25 thousand to 44 thousand dollars) [15].

In Ukraine, the training of future mechatronics specialists has generally remained the prerog-

ative of higher education institutions [13]. However, taking into account the world experience and the needs of the economy, some VS see prospects for training specialists in this area, which is supported by the Ministry of education and science of Ukraine through the implementation of relevant programs, one of which is the EU program "EU4Skills: best skills for Modern Ukraine", which, for example, higher vocational school No. 21 of the city of Mykolaiv received half a million UAH for the equipment of industrial training workshops and laboratories for professional training of future electricians, for their mastering renewable energy and mechatronics systems. Within the framework of the program "EU4Skills: best skills for modern Ukraine", the institution has specialized laboratories for "robotics and smart home devices", "power electrical equipment" and "electric lighting and start-up equipment". According to the data, the carried out activities contributed to improving the level of professional training, taking into account today's requirements, creating an innovative educational environment for professional training [5].

The process of digitalization also largely applies to the transport industry. Currently, transport systems are undergoing significant changes in operation, and therefore repair. Unmanned control technologies, neural networks, and artificial intelligence are the reality of the present and the prospect of the future. In addition, the introduction of the latest technologies for regulating traffic has led to the emergence of intelligent transport systems, which are a mixture of computer, information technology and telecommunications developments along with knowledge in the automotive and transport sectors. Intelligent transport systems are defined as the use of computer, Information and communication technologies for driving vehicles, including their repair and maintenance [6]. Specialists in the repair and maintenance of this type of transport systems must have technological thinking, skills in working with electronic equipment and control systems. However, training in this sphere also faces a number of problems: the lack of highly qualified teachers-practitioners, the lack of the latest professional literature, the imperfection of the material base, difficulties in organizing industrial practice and industrial training. Therefore, in order to improve the level of professional training, the organization of the educational process according to new, productive educational technologies for the motor transport profile should cover the following elements, which can be applied to all the disciplines of vocational training [9]:

- supply of the educational process with information sources;
- introduction of innovative production technologies with high educational potential;
- creation of an innovative climate among teachers aimed at comprehensive professional development;
- close cooperation with stakeholders, social partners, and employers with their involvement in organizing the professional training process;
- material and technical support in accordance with modern requirements;
- availability of a modern highly equipped enterprise as a social partner for conducting training qualified labor resources;
- available prospects for the introduction of advanced educational technologies;
- training of future specialists in accordance with the needs of the labor market.

Obviously, training future qualified workers requires the implementation of the latest approaches to professional training, the introduction of modern forms and methods of training. It

is not important without sufficient state provision, because digital equipment should be in the hand of everyone. The next important aspect is ensuring digital literacy of both stakeholders of the educational process: teachers and students, which can be done on the basis of VC as well. Thus, VS can be both offer and receive educational services. Thus, as the research shows, among the educational technologies decisive in the education of the future, we should highlight [8]:

- corporate online training (a training model that allows students to move along their own route using adaptive formats);
- competence measuring (assessment of competency and individual learning progress);
- flipped learning technology (a form of blended learning with advanced homework assignments);
- alternative learning styles (learning styles that offer students a more interactive experience – writing code in a browser, completing online tasks);
- online training based on competencies (involves combining training modules, taking into account flexibility and adaptability to the changing labor market), etc.

3. Conclusion

The conducted research enables to state that digital transformation of vocational schools is an urgent process aroused both by the distant learning due to COVID-19 restrictions and primarily by the global modernization through digitalization of production processes. The process of digital transformation of vocational education implies a high level of digital competency of all its participants, which calls for the search of and realization of effective forms of teaching and learning applying digital technologies. A digital divide between teachers and students arouses the necessity of systemic measures to eliminate it: raising teachers' digital knowledge and skills, students' and teacher's mastering various educational software and digital tools to apply them for educational purposes.

Considering applicable and practical nature of vocational education, it should be realized on a competency-based, student-centered approach, so that a student acquires necessary skills to maintain complex automated digital processes at production etc.

Since digital technologies are considered as those rapidly developing and expensive, their application requires their constant upgrading as well as upgrading of corresponding skills of working with them and sustain the educational process. Thus, it is possible only on the level of interested parties – governmental, regional or municipal or other future employers who can provide VS with necessary equipment and upgrade the software. Having access to high quality digital equipment and necessary skills to work with it will raise students' and teachers' confidence and motivation.

Further research may be dedicated to studying person's behavior in the conditions of the virtual educational space, development of digital etiquette etc.

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