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COMMUNICATION POLICY AND TRAINING IN A DIGITAL ENVIRONMENT

(following the example of vocational high schools)

A V T O R E F E R A T

of dissertation work for award
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The dissertation contains an introduction, an exposition in three chapters and a conclusion. The total volume of the scientific work is 184 standard pages. 17 literary sources, 14 articles and reports, 5 periodicals, 4 normative documents, 67 electronic sources of information were used. As an illustration of the text part, including results of empirical studies, there are 62 figures and 1 table. Included are 3 appendices totaling 8 pages.

The author of the dissertation is a doctoral student of an independent form of study at the International Business School.

The defense of the dissertation work will take place on …….from ……..hours in the hall……of the Distance Learning Center of the International Higher Business School - Sofia.

I. GENERAL CHARACTERISTICS OF THE DISSERTATION

1. Relevance and importance of the topic

In recent decades, the progress of computer technologies has played a decisive role in scientific development, which has led to their wide integration into the educational system, including vocational education.

The topic of the dissertation acquires particular relevance at the present moment, since the COVID-19 pandemic and global trends have made the digitization of education not only desirable, but also imperative, which becomes a key factor for successful learning and achieving results in accordance with European and world standards.

The study of internal communications in vocational high schools shed light on how the existing communication methods and means lead to the achievement of the desired results and what positive changes can be implemented.

The object of the study is centered around vocational high schools, and **subject** are their internal communications in a digital learning environment, by applying innovative communication methods.

The purpose of this dissertation research is to establish the effectiveness of the current communication policy in vocational high schools at different communication levels. This includes: Assessing the effectiveness of communication between different communication levels; Assessment of the effectiveness of teacher-student communication, which is considered a key element in the learning process; Identifying the need to update and optimize the methods and tools used to manage communication during digital learning – an important factor in achieving learning goals.

The steps to achieve the desired goal are as follows:

- Based on basic theoretical statements, determining the levels and types of internal communications in the digital learning environment.
- Tracking and establishing the methods and means used to carry out internal communications.
- Studying the satisfaction of both students and teachers with the quality of communications in digital learning.
- Analyzing and synthesizing research findings to support the author's hypothesis and identify current issues.
- To make recommendations to improve the communication management policy for digital learning.

The research thesis *is that the digitization of education and the replacement of conventional methods of communication at the various educational levels in vocational high schools is an opportunity to improve its quality in accordance with European and world standards.*

The study proposes two hypotheses:

The first hypothesis *suggests that standard learning methods and tools can still be applied effectively in a digital learning environment.*

The second hypothesis *claims that the process of digitization of education changes the methods and means of teaching and communication between teachers and students.*

A comprehensive will be applied **an approach** combining quantitative and qualitative research methods. The quantitative part will include teacher and student **surveys . For the qualitative part, interviews** will be conducted with pre-prepared questions.

Restrictions may have an impact on the research : limited accessibility to the research objects; limited school community research; different level of computer literacy of the studied group; limited time to conduct the research; small number of studies in the study area; possibility of disinterest or inability to respond to surveys and participate in interviews on the part of some subjects of the study; possible momentary mental or physical conditions of the surveyed and interviewed subjects of the research; influence of external factors such as media, parental or other intervention, unfavorable development of the economic, political or other situation in the country at the time of the study and others.

These limitations are taken into account in the interpretation of the results and the conclusions arising from what is valid as of June 2024 and after that no changes have been removed in the regulatory documents.

II. THE STRUCTURE OF THE DISSERTATION

III. BRIEF OVERVIEW OF THE CONTENTS OF THE DISSERTATION PAPER

Chapter one. Theoretical and methodological foundations of communication policy in professional education and training

1. Nature and development of the concept of communication

Regardless of the stage of human development, communication follows certain patterns and stages. In scientific literature, the terms "communication" and "communication" are used interchangeably. To achieve the objectives of this dissertation, the author emphasizes the importance of researching widely accepted concepts and formulations in the scientific literature applicable to vocational education and training (VET).

There are many definitions of communication in various literary sources. Based on the study of these sources and the analysis of the different definitions of communication, the author came to the conclusion that:

"Communication is a process that takes place in four stages with at least two participants, with a pre-planned outcome and goal of communication." One of them encodes and sends a message through a certain channel and with a certain purpose, and the other receives and decodes it, according to the context of interpretation by providing feedback to the sender. As a circular process, communication is represented in Fig. 1.

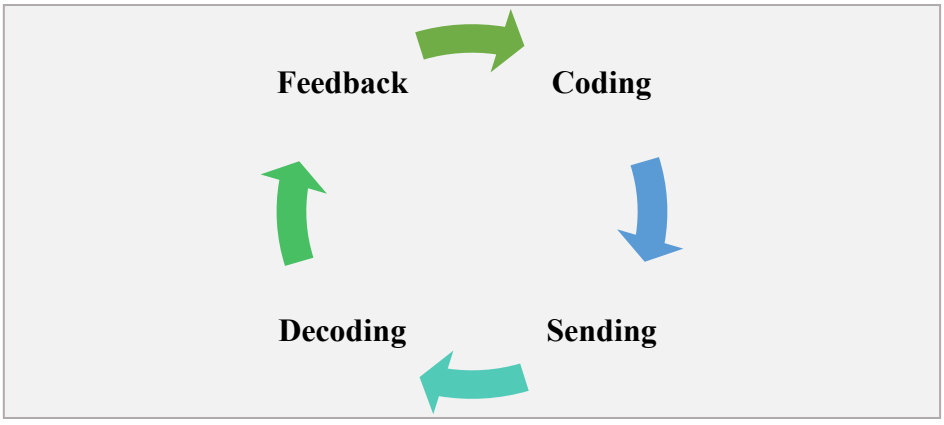

Fig. 1. *Circular process of communication*

Source: *Author's systematization*

Communications for an organization, including Vocational High Schools, can be classified according to various criteria. In general, they can be **internal and external**, **formal and informal communications.**

Since the dissertation examines internal communications in vocational high schools, the author proposes a scheme for their classification in fig. 2.

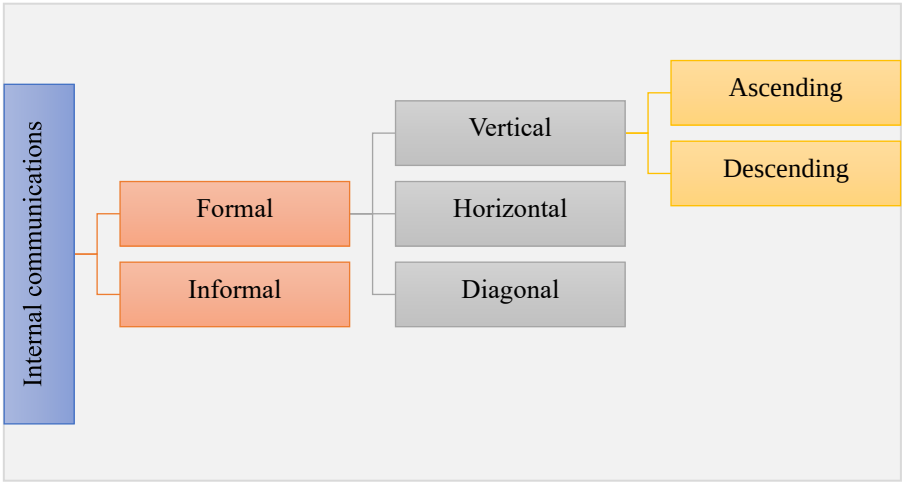

Fig. 2. *Classification of internal communications*

Source *: Author's systematization*

Communications are of utmost importance in shaping **the image** of the school institution. This is of particular importance for their development in the conditions of a highly competitive environment.

Organizational culture is of great importance for achieving effectiveness in the organization. It can be formulated in one way or another, be noticeable to different degrees for the members of the organization and outside it. It affects the level of emotions, suggests through its irrational elements, includes its values. In this regard, in *his dissertation, the author offers recommendations for creating a strong, highly functioning and innovative* OC in VS, as a condition for high efficiency of the communication process. The forms of its manifestation according to Heert Hofstede and the three levels of culture are presented according to Edgar Shane. The two authors place values as a unifying factor at the center of their analyses.

The emphasis in the activities to improve the image of VS, the author places on internal factors and their interaction.

In fig. 3 shows the dependence between EI, OC and ECP. Strong OC has an essential role in achieving high efficiency of the communication process (ECP) in VS. In turn, good communication contributes significantly to building a strong OC, and good communication comes with existing emotional intelligence (EI), which can be

nurtured. We will not be wrong if we say that they are interdependent and work to improve the image of VS.

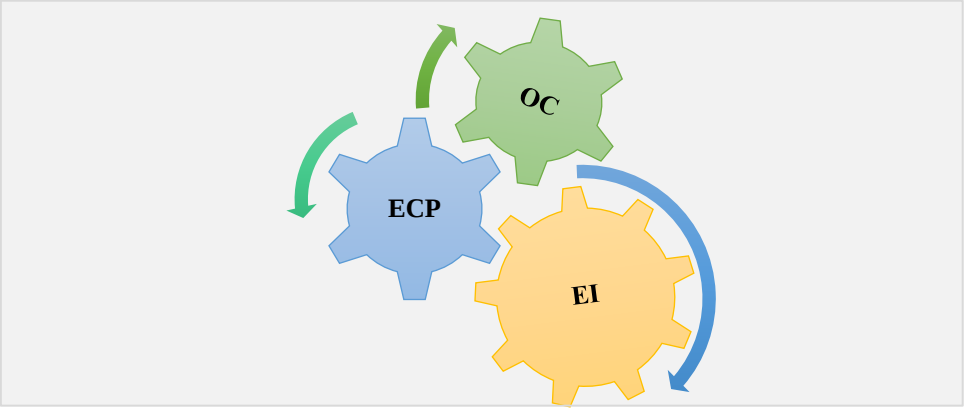

Fig. 3. *Interaction between OC, ECP, EI*

Source *: Author's systematization*

In the context of organizational/school communication, **we suggest** some key aspects of emotional intelligence, similar to those presented by Daniel Goleman in his book "Emotional Intelligence": self-awareness; empathy; active listening; emotional control; conflict resolution; building trust; good social skills; adaptability.

Overall, emotional intelligence in school communication is a valuable asset that leads to improved peer, teacher-student, and student relationships, better conflict management, improved teamwork, and better achievement.

Internal VS communications serve as the primary method of sharing information within the school community between the various communication levels and within each of them. For the effective functioning of the school organization and the preparation of students for future challenges, a good communication policy and awareness throughout the school community, clean and transparent communication relationships are essential. The communication skills of the school principal and the entire management team play a crucial role in ensuring an effective communication process.

Communication processes in the organization are not a constant quantity. Changes may be made to increase efficiency, a need imposed by external factors – a change in teaching methodology, state regulation, actions of competing schools, or as a result of internal processes that are beyond the control of the school's management. Each of these changes can lead to positive or negative results of the organization's

activity. *The purpose of the management of communication processes is to monitor these results and make corrections to improve the quality of the educational service.* In the dissertation work, a parallel is drawn with business process management (BPM), where different approaches are used, suitable to be applied in vocational high schools, with the subject of research being internal communications.

2. Internal communications at the research site

After research, analysis and systematization of the received information, the author presents the communication levels in vocational high schools (Fig. 4).

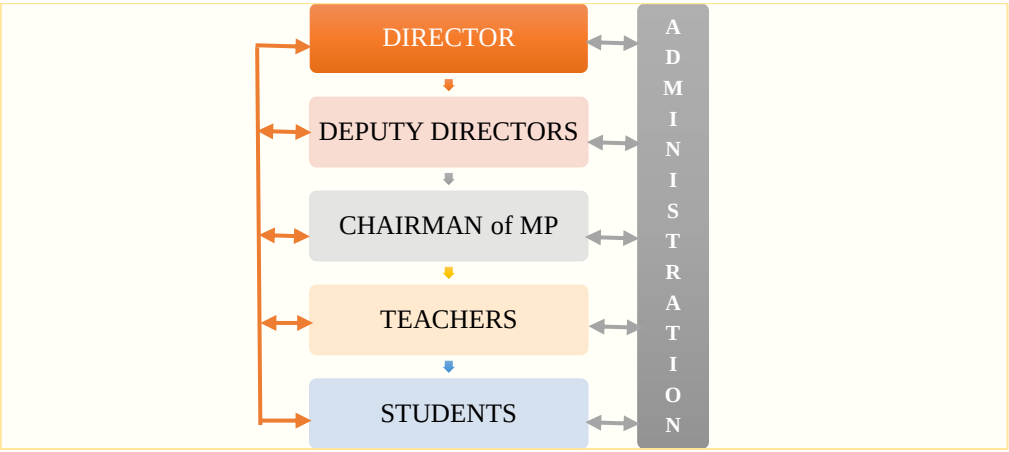

Fig. 4. *Communication levels in VG*

Source: *Author's systematization*

The administration in the indicated scheme is a separate unit, but at the same time closely related to the organizational framework of the school, it directly interacts with all other management and communication levels. Business communication in this structure takes place in the three main directions - vertically, horizontally and diagonally of the communication channels. levels.

The directions for communication within the organizational-communication structure of vocational high schools are also presented and described (fig. 5).

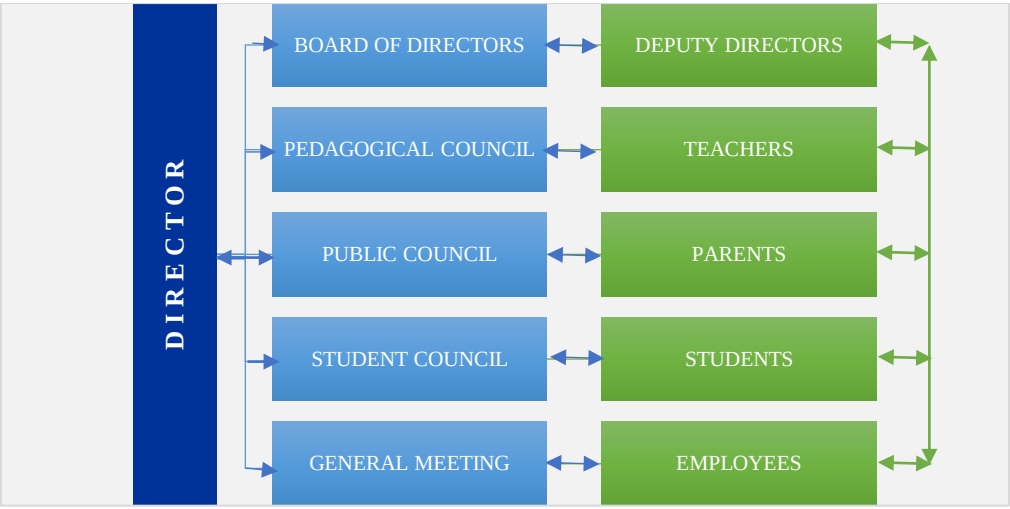

Fig. 5. *Communication direction in the OCS of PS*

Source: *Compiled by the author*

The internal communications in vocational high schools are described in detail, and they correspond to those described in the first. Attention is also paid to informal communications **,** which take place at all levels of communication.

A crucial factor in effective teacher-student communication is the teacher's ability to establish trust, mutual sympathy and respect. Achieving the right balance between verbal and non-verbal forms of expression is key to achieving effective pedagogical communication, including learning in the digital environment.

3. Organization of learning in a digital environment

The widespread integration of the Internet into all aspects of life, including education, offers new opportunities for work and development. The terms digitization and digitization are often used interchangeably. Education, as an integral part of public life, forms the basis for the development of other spheres, which makes its quality decisive for the socio-economic development of the country.

The need for digitization goes beyond periods of crisis such as COVID 19. Achieving competitiveness requires the creation of an appropriate digital environment in Bulgarian schools, especially in vocational high schools, with the entire learning process being adapted to meet the requirements of digital environments, while at the same time take into account the unique characteristics of the subjects studied. The success of this educational process in a digital environment depends both on the digital

skills and communicative competence of teachers, and on the availability of appropriate resources, methods and tools for digital learning approved by the school management.

Traditional teaching methods have evolved over time. Modern tools have revolutionized the classroom experience. As technology continues to advance, teaching methods are expected to continue to evolve, incorporating increasingly innovative tools and approaches to create richer and more effective learning experiences for students. Assigning tasks related to working in the digital sphere gives students motivation and challenges, encouraging their development and growth.

Two key factors are essential for conducting effective digital training that meets European and global standards: good technical assurance and digital competence of the participants in the process.

Training in a digital environment can be conducted face-to-face and remotely. Working in a digital environment at a distance (remotely) places greater demands on both teachers and students, and skills *for effective communication in a digital environment are crucial* .

Two types of distance learning identified by V. Boikov and D. Boikov are considered - **synchronous** and **asynchronous learning** , the phases through which it takes place are presented.

According to the author's point of view, synchronous distance learning is more suitable for students in the first high school stage. This is because for them immediate motivation, active participation in lessons and quick feedback play a crucial role in the successful learning of the learning material.

It was emphasized that the Bulgarian education was and should remain at a high level not only in Europe, but also on a global scale. In order to achieve this, the education system must go through digitization and digitization, as indicated in the project for the digital transformation of Bulgaria from 2020 to 2030.

The author identifies a significant challenge in insufficient technical resources in schools and the lack of readiness of teachers to work effectively in a digital environment. While the reasons behind the first problem are objective, the second problem includes subjective factors such as inadequate training provided by higher education institutions for teachers to work with ICT, lack of motivation to improve, resistance to the adoption of innovations or outright refusal to adopt them.

The author's opinion is reflected that *digitization, including the future digitization of Bulgarian schools, will facilitate access to native language education for Bulgarian children living abroad and children with disabilities.*

What does digital literacy mean and what do we need to know about it?

The process of literacy development is visually represented in fig. 6. It illustrates the transition from technical, through computer and digital to virtual literacy.

The modernization of education requires new approaches to providing learning information and effective communication with students. The use of innovative resources requires appropriate technical training and digital literacy among educators. It is known that teachers in Bulgarian schools, as well as throughout Europe, are older. This trend is the same in vocational high schools - presented graphically and in a table for five consecutive academic years according to data from NSI.

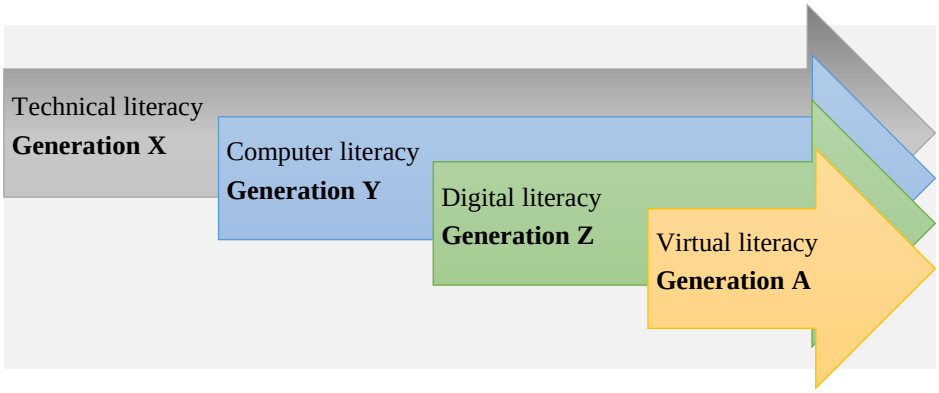

Fig. 6. *Development of literacy*

Source: *Author's systematization*

Working in a digital environment represents a serious challenge for a significant part of Bulgarian teachers. This challenge stems from the need for specific knowledge to deliver e-based learning.

An important problem arising from digitization is the development of dependence on electronic devices during extended periods of use. *Cultivating "healthy" practices for working in a digital environment, with the intention of avoiding the adverse effects of excessive digitization, also serves as an indicator of a person's digital literacy.*

The most frequently used platforms for remote communication in a digital environment are: Facebook; Messenger; Viber; Skype; Zoom ; Google Classroom and G Suite; Microsoft Teams; School.

It is the author's opinion that *applications such as Facebook, Viber or Messenger are inappropriate for educational purposes. They can be useful for informal communication or as adjuncts. The learning platform should offer high-quality and affordable synchronous and asynchronous learning.*

Conclusions are drawn based on a study of literary sources, the most important of which are:

- A definition of communication is derived, the communication levels and directions are presented, as a basis for tracking the effectiveness of communications during the empirical research, a systematization is made for literacy development.
- The opinion was drawn that for conducting effective digital training, the key factors for its conduct, the creation of healthy practices for working in a digital environment was proposed.
- The serious challenge of insufficient technical resources in schools and the lack of readiness of teachers to work effectively in a digital environment has been identified.

Chapter two. Empirical research in the research object

1. Description of the research object

Over the last few decades, there has been a growing belief in Europe that VET plays a crucial role in achieving sustainable socio-economic development. According to information from the website of the European Commission - European Education Area, on average about 50% (European Commission, 2021) of young Europeans aged 15 to 19 are trained in VET in the upper secondary stage of secondary education. However, it is important to note that there are significant regional differences in participation rates within the EU, ranging from as low as 15% to well over 70%. The results of a Cedefop study, "The Future of Vocational Education and Training in Europe: 50 Dimensions of Vocational Education and Training", show that each EU country has its own approaches and specifics of its VET systems. However, in all the unifying units are "…occupation-specific education and training aimed at ensuring the supply of skilled labor… ; mainly aimed at young people; providing qualifications at the secondary level of education (ISCED-11 levels 3 and 4) and is financed from education budgets" (Cedefop, 2023). European initiatives aimed at adapting to rapid changes in the economy and society emphasize the continuous improvement of education and training systems. The aim is to modernize these systems in order to effectively raise the level of employment, promote social integration and provide lifelong learning opportunities for all people. Furthermore, these efforts aim to make upskilling accessible to everyone, in line with the evolving needs of society and the labor market, not neglecting the fact mentioned in the above Cedefop study ".. individual development and personal growth are assessed as more important than the provision of qualified labor" (Cedefop, 2023) in Bulgaria and some other European countries for the age category of our study.

The school functions as a social institution providing educational services. The successful transfer of knowledge and skills to students, vital for their growth, depends on the effectiveness of communication channels in the school. The responsibility for promoting a favorable environment for the development and improvement of students falls on the management and staff of the school.

This part mainly presents the Professional High School of Design "Elisaveta Vazova", which is one of the objects of research and a place where the results of the conducted research will be tested.

Other VS that have withstood the challenge of time and changes in the economy, which were offered to join the survey from different regions of the country in order to achieve maximum objectivity, are: Vocational high school for clothing "Princess Maria Luisa", Sofia; "Nikola Yonkov Vaptsarov" Technical Vocational High School, Radomir; Professional Technical High School "Nikola Vaptsarov" - town of Samokov; SU "Angel Karaliychev", Strazhitsa; Varna Maritime High School "Saint Nicholas the Wonderworker"; "Dr. Ivan Bogorov" Vocational High School of Economics; "Petko R. Slaveykov" Vocational High School, Yakoruda.

Almost all majors in vocational high schools have extended study of foreign languages, most often English.

In order to improve opportunities for further education, VS cooperates with prestigious higher schools and universities in the country, including the International Business School (IBU), UNWE, TU, NBU, etc.

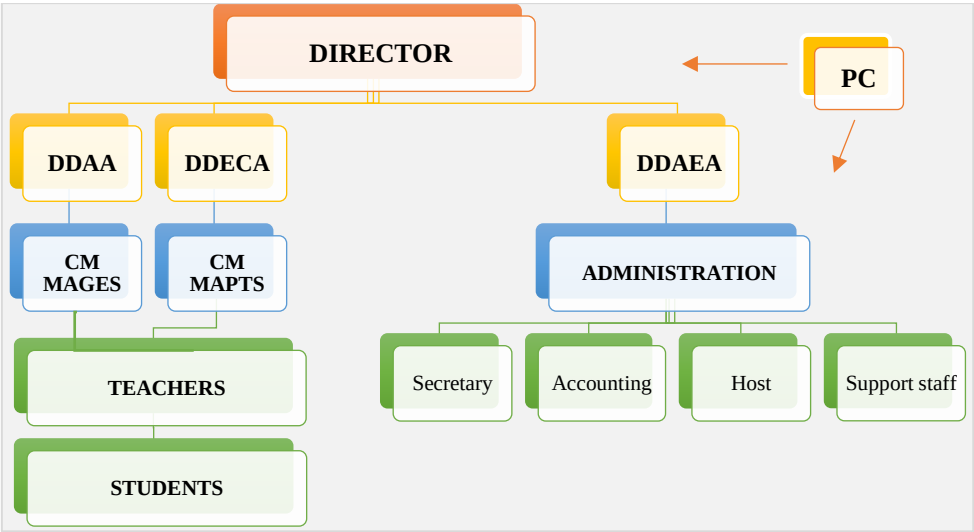

Fig. 7. *Summary diagram of the organizational structure in VS*

Source *: Author's systematization*

Recognizing that effective learning is largely dependent on communication, VS have established communication structures that are closely aligned with its management structure. In this regard, a generalized scheme of the administrative and management structure of the VS is presented above (Fig. 7).

Since in most schools the organizational-management structure and the communication structure are very close, the research further examines them in this way, using the relevant methods and approaches.

2. Research approaches and methods

The research techniques of the dissertation include the collection, compilation, analysis, interpretation and implication of data regarding communication within vocational education in the context of the digitization of learning. These methods are categorized based on various criteria and presented in the dissertation. The study includes the collection of data from primary and secondary studies, subject to established criteria:

- Choice of research area: Communications in vocational high schools.
- Defining and developing research objectives, inquiries and hypotheses stated in the introductory section.
- Completion of initial review of background information pending more comprehensive analysis.
- Identify appropriate data collection techniques selected based on their applicability to the study.
- Research and interpretation of collected data.
- Formulation of conclusions and conclusions after a thorough analysis of the research data.
- Completion of the research process, including final recommendations.

Since for the purposes of the study, quantitative and qualitative methods are applicable to measure structured samples suitable for research and to validate or refute hypotheses, guaranteeing the reliability of the study, the positive position of the researcher/author and his objectivity, the dissertation undertakes the philosophies of **realism** and **positivism** .

The choice of approach is of great importance to the research process.

Both deductive and inductive approaches are applied to achieve the research objectives and focus around observation and data collection preceded by formulated hypotheses. The collected data are analyzed and conclusions drawn from the sample study.

The dissertation focuses on the extraction and research of data involving teachers and students in vocational high schools, making up **the target group** . Within this target group, two distinct subgroups/framework groups are outlined: teachers and students, both of whom are the main participants in the communication process.

The information obtained from **the study of literary sources** is crucial both for theoretical justification and for aligning the research with the strategic goals of high

schools. As for **the qualitative analysis** of the data, it involves the examination of recordings of the interviews conducted. In the context of this research, *a content analysis is performed* , involving the categorization of data obtained from verbal and non-verbal communications between the researcher and the respondent.

In order to confirm or disprove the hypotheses, **a quantitative** analysis of the data collected from the survey is carried out using rigorous evaluation.

A comprehensive analysis and interpretation of the primary research data is then carried out, followed by a comparison with secondary data.

Quantitative research results are presented in different forms, including different types of charts and tables.

The analysis of the data obtained is consistent with the overall research methodology and means used to present the data obtained.

3. Results of an empirical study conducted

In order to evaluate the real situation in the research object regarding the effectiveness of the communication processes in VS, it is necessary to conduct an empirical study.

The survey in the vocational high schools was carried out in the manner described in the first chapter and was carried out during two school years, and during this period 198 teachers responded to the survey, 63 of them agreed to be interviewed. 339 students took part in a specially prepared survey. All respondents had the opportunity to answer at a time convenient for them, subject to the ethical principles described in the first chapter.

The questions and possible answers are available in the appendices of the dissertation - Appendix No. 1, 2 and 3, with 23, 7 and 15 questions respectively.

In the abstract, the author presents the most important results of the empirical research, directly related to confirming the author's thesis, proving one of the hypotheses, denying the other, as well as results related to establishing the effectiveness of the communication policy of VS at and between the different communication levels.

The answers from the respondents to the statement that "Digitalization of the learning process changes the methods and means of teaching and communication between teacher and student" are visible in fig. 8.

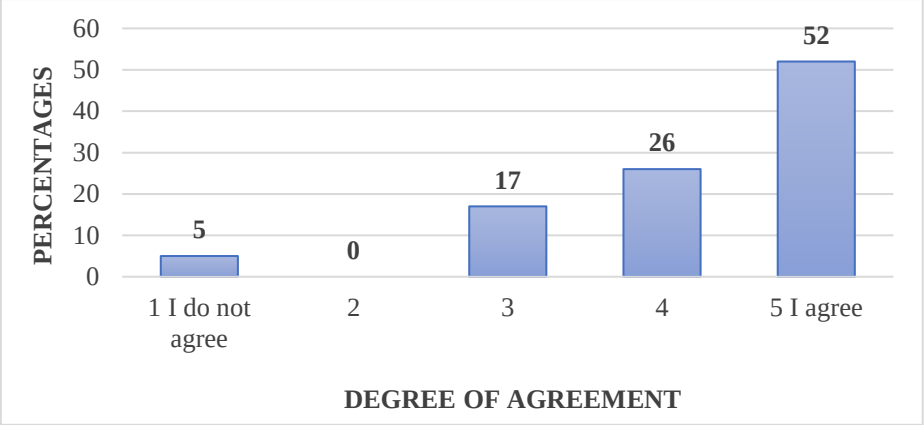

Fig. 8. *Changing the methods and means of teaching and communication between teacher and student during digitization of the educational process*

Source: *Teacher survey compiled by the author on Google Forms, question 4*

They confirm the second author's hypothesis and support the research thesis, which is visible in Figure 8, where 78% of the responses are strongly in the right half of the graph with a high degree of agreement.

In accordance with the purpose of the research is the question of the effectiveness of communication between teachers and students including and feedback in the conditions of digitization in face-to-face learning according to teachers and can be seen in fig. 9.

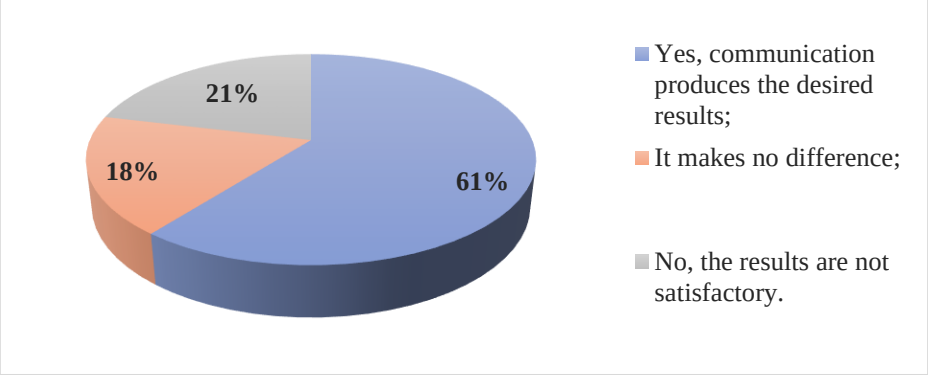

Fig. 9. *Effectiveness of communication between teachers and students, including feedback in the conditions of digitalization in face-to-face learning*

Source: *Teacher survey compiled by the author on Google Forms, question 11*

According to 61% of those who answered this question, communication gives the desired results, 18% believe that there is no difference whether or not there is digitalization in communication and also 21% claim that the results are not satisfactory.

Another part of the research shows that digitization has a positive effect on the quality of vocational education, which coincides with the author's opinion, stating that the most important conditions for the effectiveness of pedagogical communication in vocational high schools when learning in conditions of digitalization are the good organization of the learning process and the correct selection of methods and means of pedagogical communication. The majority of respondents are of the opinion that digitization of the educational process is necessary to increase the quality of education. It is clear that *digitization is realized as a way to deal with daily tasks related to both pedagogical communication and administrative activities faster and more efficiently.*

The results of the responses of the teacher respondents to the statement that there is effectiveness of the current high school communication policy between the different communication levels show a high degree of agreement.

The teacher interview, containing seven questions, took place both in real life and in writing in a digital environment. We will summarize the answers to the individual questions. The following figure 10 presents the responses of the respondents in a systematic manner.

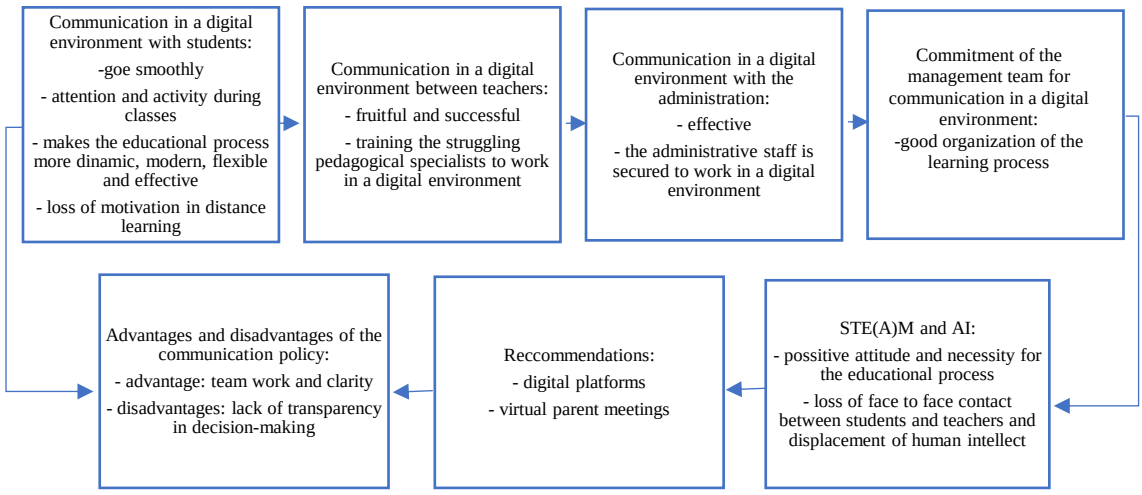

Fig. 10. *Communication policy in a digital environment*
***Source** : Author's systematization*

In order to have feedback in the survey, the students from the first and second high school stages in the vocational high schools were also included. At the same time, the obtained results will serve as a corrective in the study.

According to the obtained results, students unequivocally express their desire for digitalization of education, considering that digital learning tools are applicable in

professional education. It can be assumed that *in the future students will have more and more autonomy in learning in vocational high schools with the participation of digital technologies.* They share the same opinion regarding the need for digitalization to improve the quality of education.

The difference in the results of the survey of the two groups of respondents comes about the effectiveness of communication between teachers and students when using electronic resources (Fig. 11), which suggests the presence of a problem in communication between these two levels.

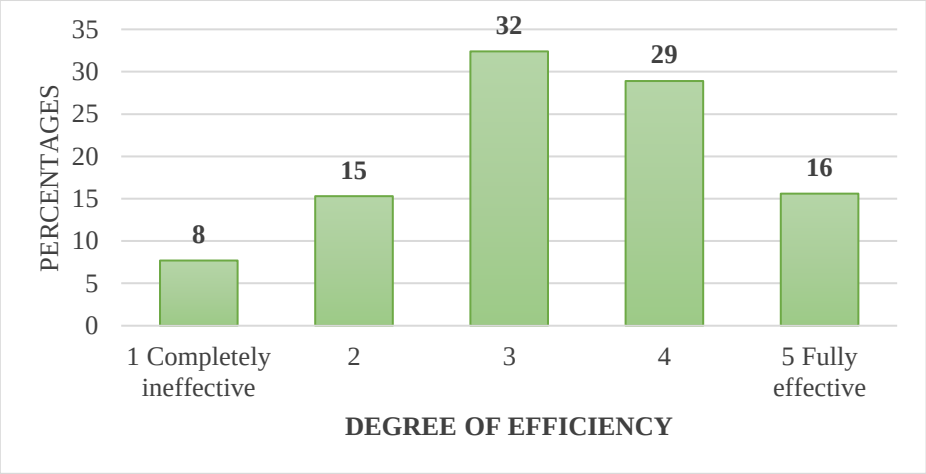

Fig. 11. *Effectiveness of communication between teachers and students when using electronic resources*

Source: *Student survey compiled by the author on Google Forms, question 9*

The graph of the effectiveness of communication between students and the administration looks similar.

On the last 15 open-ended question of the survey "What would you recommend to improve communication links in the school in the conditions of digitalization of education?" the students expressed their desire to work with modern digital means and to be taught by those who are better prepared to work with them and with an innovative approach to training teachers.

The results of the conducted survey raised a number of questions. Education is a sector of the country's economy, with particular importance for the development of all other sectors. Professional education, which trains personnel directly involved in the creation and realization of products that form the GDP of the country, has a huge responsibility before the whole society to provide all the conditions for the construction

and realization of specialists, ready and able to meet the needs of this society and to be competitive on the European labor market. *And what are the requirements of the European labor market?* These questions are answered by the strategic documents of the EU, in particular of the EC, related to the digitalization of the EU member states, described in the dissertation. Undoubtedly, the COVID crisis accelerated digitization processes throughout the EU, thanks to the actions taken and the directives issued in this direction.

Although this is also felt in our country, unfortunately the results of the index report for the index of the penetration of digital technologies in the economy and society (DESI) for the year 2022 are not at all optimistic, which can be seen in the figure (Fig. 12).

Fig. 12. *DESI index for Bulgaria for 2022*

Source: https://bulgaria.representation.ec.europa.eu/strategiya-i-prioriteti/osnovni-politiki-na-es-v-blgariya/cifrovizaciya_bg

The report states that "Bulgaria ranks 26th out of 27 EU member states in the European Commission's 2022 Digital Inclusion in the Economy and Society (DESI) Index (European Commission, 2024). According to the DESI indicators, 32.6% of Bulgarians have basic digital skills, compared to 45.7% for the rest of the Europeans. Regarding the online interaction with the state administration, the ratio is 34%/65% in favor of users from the EU compared to Bulgaria. Things are no better with the

digitization of enterprises, which is half of the EU values. Only in the field of household connectivity do we lead the EU - 85% for Bulgaria against 50% for the EU. This largely explains the results of the conducted research and answers some of the questions raised, but raises a new question:

To what extent is the evaluation and self-evaluation of the Bulgarian teacher realistic?

A large number of teachers feel more prepared to work in a digital environment after the training and believe that they achieve effectiveness from communication with students, claim that the communication policy in schools is very good, but according to the DESI results, this is not enough because as we have already mentioned, education is the basis of the sustainable development of the economy. This is confirmed by the results of the student survey, according to which *the effectiveness of the most important communication, that between teacher and student,* could be at a better level.

The students' request is categorical regarding their desire to study with digital means, as well as their applicability, including cloud technologies and virtual reality, which is in full compliance with EU priorities and amendments and additions to the Law on Vocational Education and training (LVET) from March 2024, namely the implementation of activities such as: "development and introduction of educational materials with innovative digital learning content" (European Commission, 31 March 2024).

Based on the results of the conducted research and taking into account the limitations of the research, the most important **conclusions of the second chapter are the following:**

- Working in a digital environment requires changing the methods and means of communication between teacher and student.
- Digitization is necessary to increase the quality of education and the quality of the communication process in high schools.
- There are no communication problems at the same communication level.
- There are no communication problems between teachers and administration and management.
- There is some contradiction in the answers of the two groups of respondents regarding the effectiveness of the current communication policy of the high school. In practice, this means the presence of communication problems between the different

communication levels, namely between teachers and students, as well as between students and administration.

- The level of penetration of digital technologies in the economy and society (DESI), respectively in education is unsatisfactory.

Bearing in mind these conclusions, in the following third chapter, the author presents his view regarding innovative techniques for pedagogical communication in learning in a digital environment in order to increase the quality of pedagogical communication and the educational process.

Chapter Three. Innovative communication techniques for learning in a digital environment

1. Virtual and visual pedagogical communication

In the context of a school environment, traditional visual communication is represented to a significant extent in classroom activities during theoretical and practical training of students in a face-to-face environment. Through visual communication, knowledge is transmitted orally or in writing, according to the communication skills of the teacher and the capacity of the students to perceive the content. Multimedia tools are also used, along with computers equipped with specialized software, as discussed above.

For the current digital generation, only providing information and technical demonstration of specific operations during teaching is insufficient to capture and maintain their focus on the specific problem. It is imperative that they are actively engaged in the classroom by motivating active participation in the learning process and experiential learning. Teachers must be well versed in new technologies and their potential to provide education that meets the expectations of this new generation. Both student expectations and modern reality pose a significant challenge to Bulgarian teachers: mastering virtual pedagogical communication, in addition to traditional visual communication, in a short period of time. These new technologies do not displace the crucial role of the teacher in the educational process; rather, they require age-appropriate pedagogical communication approaches and student expectations.

The visual communication tools used in PG, presented in the next section, can also be seen as transitional, bridging the gap between traditional and virtual pedagogical communication.

In his article "Innovative Communication Techniques in Digital Learning", the author points out several programs and applications that have been used in teaching the subjects of vocational training in PG. Some of them are Adobe Photoshop; Adobe Illustrator; CorelDRAW; AutoCAD; 3D Studio Max.

The evolution of technologies and their potential applications in the field of education has led to a new form of pedagogical communication - virtual communication. It is obvious that technical resources are indispensable for its implementation, facilitated by the dissemination and storage of information through digital media.

Until recently seen as a distant future, today Virtual Reality (VR) is quite tangible, transforming the way we perceive ourselves in the real world and how we understand it. “Virtual reality is unreal. It is achieved through the use of high-tech computer systems to synchronize sensory perceptions with software and hardware to achieve a sense of presence in the studied environment (Antova, 2023).

At this stage, integrating VR into school education remains an ambitious endeavor due to the significant costs associated with the required components. However, as financial barriers are surmountable, the use of VR for educational purposes has the potential to offer a highly immersive approach to learning, providing students with an unparalleled 'experience' of the learning material being taught.

Innovative technologies that provide engaging and unique learning experiences stimulate students' imaginations and encourage creative thinking. They represent a pedagogical approach that is closely related and suitable for effective communication with today's digital generation of students and a step towards the next.

Just as in traditional education, virtual learning also requires different educational materials that must be tailored to the learning material being studied and the specific technologies that will be used. In this category, along with the educational platforms used to create online classrooms discussed in the first chapter, there are also e-textbooks, virtual libraries and laboratories.

In his article "Innovative communication techniques in digital learning", the author presents the popularity of social networks before and after the pandemic. To varying degrees, social networks have been and continue to be included in the exchange of information in pedagogical communication.

Innovative technologies that introduce new and different forms of pedagogical communication stimulate the imagination and creative thinking of students. It can be said that the use of ICT for pedagogical communication is the way to effectively connect with the current generation and step towards the next. One of these tools is virtual educational resources, as a currently leading alternative to conventional education and **project-based learning** as a method extremely suitable for application in PG, both in general education and in professional training of students.

In essence, project-based learning develops the communicative abilities of students and their teachers to work in real and virtual environments. When this communication is used to implement a design project, the author calls it *creative communication* .

The method of project-based learning used in a digital environment and described by Glenn Whitman and Ian Kelleher. In their article "Your Checklist for Virtual Project-Based Learning" (Whitman, Kelleher, 2020), they present in several steps **the preliminary preparation** necessary for a teacher and students: overview of the basic knowledge; filling in blanks; consolidating and consolidating knowledge through practice and exercises; education of students' independence; using an effective asynchronous learning strategy to give students enough time to discover, learn, evaluate and consolidate new information; evaluation of acquired knowledge .

In order to ensure the effective implementation of a specific project, the dissertation provides guidelines for achieving work motivation when conducting training using this method. Also described are the additional prerequisites mentioned by Glenn Whitman and Ian Kelleher, in their aforementioned article on successful project implementation, which the author supports.

The use of project-based learning represents an excellent opportunity to use theoretical knowledge in practical work, which makes it particularly suitable for vocational high schools. In addition, technology does not stop improving, and even more so in the educational process cloud technologies are integrated.

"Computing/cloud computing" is a term used to describe services and infrastructure for storing, processing and managing data via the Internet. The dissertation describes the three types of clouds – public, private and hybrid, as well as cloud services, which can also be of three types: Infrastructure as a Service (IaaS); Platform as a Service (PaaS); Software as a Service (SaaS).

Cloud technologies provide many **advantages** that professional education can take advantage of. These are: accessibility and flexibility; save on school expenses; scalability; automatic updates and maintenance; data security; collaboration and information sharing; backup and recovery; environmental efficiency.

In addition to all the benefits of using cloud resources, possible **problems are also described** , such as: interruption of the Internet connection; data security issues; poor adaptability of the software in certain situations; dependence on the service provider; limited user control over the infrastructure.

The main benefit of cloud technologies on the topic of the dissertation is the significant improvement of communication at all levels of the communication structure of high schools when using them, including improved communication with parents who have a direct interest in the educational results of their children.

2. Use of information and communication technologies for the formation of competencies in the learning process

In the context of the topic of the dissertation work and the results of the research, we will present the author's proposal for the ways in which ICT opportunities can be used for the digitization of professional education and the competencies that students can acquire in the learning process in connection with their professional realization, corresponding to the idea of the EU and the Ministry of Education and Culture for the development of PE:

- **STEM education**

There are various proposals regarding the wording of the concept, and the author believes that to the greatest extent the essence and needs of professional education are approached by that of the NSTA - National Science Teaching Association of the USA, where "it defines STEM education in general as “an experiential learning pedagogy in which the application of knowledge and skills is integrated through contextual projects or problems focused on learning outcomes related to the development of important college and career readiness skills.” (Kozhuharova, Zhelyazkova, 2021). In addition, “STEM education develops creative and critical thinking; improves the ability to solve various problem situations in the educational process and life, as a result of the better communication skills acquired when using the PBO method and the need for constant cooperation in teamwork; increases the possibility of better awareness of students on all desired topics; increases students' digital literacy." (National STEM Center, 2023)

The introduction of the STEM concept to education gives rise to the need to complement the already existing set of possibilities. This no small problem has prompted the inclusion of art alongside science, technology, engineering, and mathematics and the emergence of **STEAM** .

For clarification, we will note that STEAM is an extension of STEM education by integrating the arts into the already existing spectrum of academic subjects: Science, Technology, Engineering and Mathematics. Adding art to the initial set of STEM subjects is extremely important for a creatively oriented PG, where students can reach their potential, be free-thinking and creative using scientific knowledge of the relevant subject.

Using STEAM learning, educators have the opportunity to use project-based learning that brings all five disciplines together. In this way, it fosters an educational

environment in which every student can actively participate and learn by being actively involved in the learning process.

Unlike traditional teaching models, through this holistic approach, students can exercise both the analytical and creative abilities of their minds and acquire problem-solving skills of all kinds.

An increasingly important role in the digitization of education, adopted The STEAM concept takes artificial intelligence (AI) . *It completely changes the previous communication and its effectiveness between all levels in the VS structure.*

"Artificial intelligence can be defined as the ability of a machine to demonstrate abilities inherent in humans - to reason, learn, plan or create." (European Parliament, 2023)

AI has the potential to revolutionize STEAM education by improving the learning experience by providing personalized instruction and fostering student skill development.

How is AI impacting education and communication in STEAM?

As a result of research done by the author and his personal position on the subject, the author offers possibilities for **using AI for educational** purposes in PG: personalization of learning; intelligent content creation; analysis of student performance data; AI-based learning; gamified learning ; language training; STEM simulations and modeling; discussions about AI ethics and bias; AI in art and design; career exploration; cooperative learning.

Artificial intelligence can **help students** in STEM education or beyond: *as assistive technology; in solving real-world problems.*

In addition to the listed possibilities for the application of AI in STEM education in PG, its benefits are not limited to this alone. We can add that, thanks to AI, **teaching activities** related to: *early intervention and additional support* are greatly facilitated; *research, analysis, conclusions and decisions.*

The paper describes how the integration of AI into STEAM education can indeed increase the effectiveness of communication by streamlining processes, improving interaction and facilitating communication.

Although artificial intelligence offers many advantages for education, there are also **threats and challenges** that need to be overcome. These are: data privacy concerns, ethical considerations and the need for effective teacher training.

Overall, *integrating AI into STEAM education has the potential to increase engagement, improve learning outcomes, prepare students for the rapidly evolving labor market, and foster innovation. However, it is important to balance the benefits of AI with ethical considerations and ensure that learners remain at the center of educational goals.*

By using the possibilities of ICT for pedagogical communication and as a result of the COVID 19 pandemic, a new form of learning has appeared - called hybrid. The next point of the dissertation presents the concept of hybrid learning, its practical applications, as well as the arguments for and against it from the author's point of view.

3. Hybrid learning – a different form of pedagogical communication

The term "hybrid learning" gained popularity during the pandemic and beyond. The very word "hybrid" implies ***a fusion of different forms of learning*** , namely, ***face-to-face and face-to-face***, using ICT capabilities that are used independently of each other in traditional education (Fig. 13).

Fig. 13. *Nature of hybrid learning*

Source: *Author's systematization*

Some of the situations that may require the application of hybrid learning are presented: *the need for partial isolation; geographic restrictions; varied learning rates; need for practical training; renovation of a school building; need to optimize resources and costs.*

In vocational high schools, students have the opportunity to engage in ***distance theoretical learning*** through specialized applications and learning platforms. Practical training, which takes place during the second stage of high school education (grades 11-12), includes ***practical activities*** and creation of products on various specialized software. These face-to-face trainings can be organized within the designated practical training hours.

Pedagogical communication in this mode is also transformed. In hybrid learning, both traditional and virtual methods of communication are included. Therefore, the author suggests that the term ***"hybrid pedagogical communication"*** most accurately captures the dynamics of communication developing in the new conditions of hybrid learning.

Like any new concept, hybrid learning attracts both supporters and critics. The author's point of view regarding requirements for conducting hybrid training, its advantages and disadvantages are described in the overall development.

In essence, hybrid learning serves as an adaptive solution that meets specific challenges and needs, combining the best of traditional education with the benefits of digital resources. *Its effectiveness depends on good preliminary organization, resource provision, motivation and communication skills of the participants in the process.*

Based on a study of various literary sources, models and approaches combining face-to-face and online training, adapted to the peculiarities of vocational education and training, are presented on the example of Racheva: rotational model; flexible model; flipped classroom; activity rotation model; online guest teacher; online lab model; complement/self-mixing model.

The author presents hybrid/blended learning as *an educational approach that offers a unique opportunity for personal development* in several ways: participation in courses and seminars in prestigious higher schools at home and abroad; communication with peers from different origins and locations and thus promotes greater cultural and ethnic tolerance, fosters empathy for different social groups and disadvantaged people; has the potential to overcome communication barriers; familiarization with the different possibilities of pedagogical approaches;

The hybrid approach to education offers the opportunity for: independence and flexibility in time management; Students learn how to adapt their communication styles; excellent opportunity to apply the PBL method; improve the level of digital literacy; provides opportunities for effective feedback; improving the ability to effectively present ideas in front of a camera and a remote audience; improving media literacy and communication skills.

On the last Third Chapter, the author has made summarizing conclusions available in the dissertation work. The most important of them are the following:

- Project-based learning, independently or in STEAM learning is an opportunity for creative communication between teacher and student.

- Insufficient technical provision or lack thereof in some schools can lead to problems in using innovative methods and technologies, demotivation of students and teachers and low effectiveness of pedagogical communication.
- The integration of artificial intelligence in education could optimize communication methods and lead to greater effectiveness of pedagogical communication.
- The hybrid form of education is suitable for the second high school stage and is an opportunity for personal development.

The conclusion of the development summarizes the significance and contribution of the dissertation work, both for the scientific theory of communications, and in terms of the practical applicability for improving the communication processes in PG, with the aim of increasing their effectiveness and priority of pedagogical communication. In the process of the research, **we identified** a problem with the most important expected result - that of the effectiveness of pedagogical communication in the conditions of digitalization, which is directly related to the overall communication policy in PG, conclusions were drawn, and recommendations were made to increase the effectiveness of pedagogical communication. **We also identified** the need for a larger-scale study covering all secondary schools in order to gain a clear picture of the real situation in secondary education regarding digitization and to take comprehensive action in this regard. By conducting the research, **we proved** the need for digitalization to increase the effectiveness of pedagogical communication and to change the methods and means for its implementation, which achieved the goal of the dissertation work.

A recommendation has been made to allocate the necessary resources for digitalization of education and quality training of teachers to work in a digital environment, as these are necessary conditions for maintaining high educational standards and building competitive young people ready to accept the challenges of our and foreign countries labor market in a dynamically developing environment.

IV. CONTRIBUTIONS AND SIGNIFICANCE OF THE DISSERTATION

The contribution and significance of the current dissertation researching communication policy and learning in a digital environment in vocational high schools can be presented in several main directions:

1. *Contribution to the existing scientific theory of communications,* by deriving a new definition of communication and systematization of the types of communications in PG; the interaction between organizational culture, emotional intelligence and the effectiveness of the communication process is presented; a general communication scheme and communication directions for vocational high schools were introduced, as well as new terms - creative pedagogical communication and hybrid pedagogical communication, digital hygiene.

2. *Contribution to empirical studies* , by providing new data and results on the impact of digitalization on communication processes and their effectiveness in vocational high schools, as well as on the analysis of the obtained results, which can reveal new trends, challenges and opportunities for the participants in the communication process in VS in the conditions of digitalization.

3. *Practical significance of the dissertation* - based on the results of the study, specific recommendations are proposed to improve communication policies in PG and their effectiveness; Methods for effective pedagogical communication in a digital environment are proposed , which can be applied by teachers in the theoretical and practical training of students.

4. *Contribution to the educational system* - the conducted research provides useful and very significant information about the quality of communication policies and processes that take place in vocational high schools, as part of the entire educational system, in the conditions of digitalization; needs are defined in terms of methods and means of increasing the effectiveness of pedagogical communication during digitization for the professional education system; the students' desire for digitization of learning is clearly defined.

5. *Contribution to society* , which is expressed in the creation of a better supportive and effective school environment, after implementation of the recommendations based on the conclusions of the data obtained from the research; increasing digital literacy among students and teachers, which is essential for the

successful realization of the goals of education; increasing the digital literacy of the entire society, as a consequence of the digitization of education and achieving a higher competitiveness of the European and international labor market of Bulgarian citizens.

V. LIST OF DISSERTATION PUBLICATIONS AND CITATIONS

Publications :

1. Antova, R. (2024). Communication policy and learning in a digital environment, IBS Press, Botevgrad, Bulged OOD - 2021, Sofia, ISBN 978-619-7610-23-9

2. Antova, R. (2023). Innovative techniques for communication in digital learning. Entrepreneurship, SWU "N. Rilski", Blagoevgrad, ISSN: 2738-7402, Vol: XI, Issue: 1, 2023, pp. 31-40

3. Antova, R. and L. Borisova (2023). The Human Development Index and the Role of Education in Achieving Sustainability, XVIII International Scientific Conference "Sustainable Development - Circular Economy, Critical Infrastructures, Green Transition, May 18-20, pp. 378-387

4. Antova, R. (2024). The communication policy in vocational education and training with the help of digital technologies. XIX MNC Economic growth, business prospects, market positioning". Sofia: MVBU

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1. Quote:

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