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Pedagogical Innovations in Teacher Training and Qualification in Bulgaria

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Abstract

The development of informational and communicational technologies and the changes in perception of today's society requires a new look at the educational process of contemporary students which then leads to a newer vision of teachers' qualification. Informational technologies are often seen as the only source of innovation. Innovation could be a product of intellectual activity of people in all areas of society and is not uncommon that it becomes the subject of a deeper research.

The goal of the current research is to present the outcomes of a practical experience to summarize different types of innovation in educational system in Bulgaria and their application in the pedagogical qualification of teachers in all levels of education.

The article presents the policy on pedagogical innovation in Bulgaria, presents a classification model for such innovations and the practical experience of implementation in a long-term teacher training. It also presents the inquires on attitudes toward implementation of innovative processes in education conducted among a target group- teachers in different areas of expertise and in different levels of educational system – from kindergarten to 12th grade.

Keywords: innovative educational environment, pedagogical innovations, pedagogical qualification

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Introduction

Over the past decades, the effectiveness of all economic and social systems is in direct correlation with the systems' ability to respond flexibly to change and to adapt to the increasing dynamics in all areas of life. This trend largely affects the educational sector and outlines an up-to-date problem area related to the preparation and qualification of teachers.

What would the forward-looking strategies have to be so that they support school and classroom management, teach and use digital technologies in order to achieve sustainability, efficiency and excellence in the pedagogical work? Innovation as a trait and innovation as a process and product in the work of the teacher is crucial for the quality of the education system. Among the priorities of European research and innovation policy and the vision of the Organization for Economic Cooperation and Development, it is noted that knowledge in all its forms today plays a decisive role in the economic process. Nations with more knowledge are, competitive. Another priority measure in the Roadmap for the implementation of the Community innovation policy are the modernization of the education system to create innovation skills as well as a modern innovation policy requiring innovation support in all sectors and at all levels. In this respect, the transfer of educational innovations from science to practice, as well as vice versa, is a challenging and responsible mission for institutions involved in teachers' qualifications, school principals and, of course, the teachers themselves.

It is therefore necessary to study the status and the opportunities for pedagogical innovation in education and the related to innovations in education attitudes of teachers and their willingness to use them, as well as the conditions by which teachers involved in education form and develop their innovativeness.

Problem Statement

1.   European and national policy for innovation development

When looking into teachers' attitudes towards pedagogical innovations, it is logical to start with European and national policies in this area. Leading in this regard is the Europe 2020 Strategy for smart, sustainable and inclusive growth: It was endorsed by the European Commission in March 2010 and endorsed by Heads of State and Government of the EU in June 2010. The document sets out specific objectives which have to be achieved over the next decade in areas such as employment, education, energy use and innovation, in order to overcome the financial crisis and help Europe to re-emerge in the path of economic growth.

A key instrument for achieving the national targets set in the Europe 2020 Strategy in Bulgaria is the Operational Program (OP) "Science and Education for Smart Growth" 2014-2020. The main priority axis (PA) related to the development and applications of innovation in education are:

PA № 1"Scientific research and technology development" is related to achieving sustainable development in Bulgaria and requires investments aimed for the creation of Competency Centers, Centers for excellence, scientific infrastructure and regional intelligence specialization and international cooperation development.

PA № 2 - "Education and life-long learning" is related to the overarching goal of improving access to higher education and increasing the share of young people in higher education. Incentives are provided to motivate young people to complete higher education (scholarships, student loans), highlighting students with special achievements in science, engineering, innovation, entrepreneurship, art, culture and sports.

Investment priorities are Quality school education, Access and quality of higher education, Lifelong learning, Vocational education connection to labor market, and Informational and communicational **technologies**.

In accordance with the commitments to the mentioned above axes an Ordinance No. 9 of 19.08.2016 for the institutions in the system of pre-school and school education was issued and published in – National Journal, No. 68 of 30.08.2016, and is an active legislation since 30.08.2016. The real integration of innovative education at the school level has begun. The Innovative Schools project was launched. In official data provided by the Ministry of Education and Science, about 12% of all schools in Bulgaria are included in the list of innovative schools in the Republic of Bulgaria. The percentage is not high, but the process is related to a number of difficulties that are analyzed, explored and summarized.

2.   *Promoting innovation though EU financed projects/grants*

Contemporary reality and innovation policies inevitably create new challenges for teachers' qualifications. This requires the training institutions to look for ways to provide a modern training process with the application of the latest innovative technologies for organizing and effectively conducting the processes in the classroom.

Erasmus + with its Key Activities (KA) 2 and KA 3 provides just the right opportunities for such actions.

KA 2: Cooperation for innovation and the exchange of good practices provides opportunities for support in the areas: strategic partnerships in the fields of education, training and youth; alliances of knowledge, skills alliances; capacity building in the field of higher education; capacity building in the field of youth.

KA3: Support for policy reform: includes centralized knowledge-based activities in the fields of education, training and youth; Innovation policy initiatives and cooperation with international organizations.

The Department for Information and In-service Teacher Training (DIITT), Trakia Univerity, Stara Zagora, Bulgaria is a partner and a beneficiary in various EU projects which provide direct access to highly experienced partnerships in the area of creation, integration and use of pedagogical innovations and which provide development opportunities, upgrading and adequate approbation of innovative strategies, forms, approaches and methods of innovative pedagogical activities. The projects allow dissemination of good practices from Bulgaria and voices the initiatives and achievements in the area of Bulgarian education. Some of the successful examples of such implemented projects and the good practices they present related to innovative activities for teacher training are: **Key TTT – Teamwork, Training and Technology for development of Key Competencies** (key competencies: team work, training and technologies), Comenius, Lifelong learning, 2009 –2011, Education Policies in 21 Century – EDU 21, Programme LIFELONG LEARNING PROGRAMME Centralized, EACEA/20/2012, (535904-LLP-1-2012-1-BG-KA1-KA1ECETA2), 2013 –2014, „European night of science" – European Commission's initiative which began in 2005, financed by VI-th and VII-th Framework Programme and Horizon 2020; EMPAQT- Empathic and supportive teachers – Key to quality and efficiency in education", ERASMUS + KA3,ProSocial Values (PSV) – Pro Social Values 2017-1-IT02-KA201-036860, ERASMUS + KA2 – Cooperation for Innovation and the Exchange of Good Practices KA201 – Strategic Partnerships for school education – Pro Social Values and others.

The main objectives in the projects are to exchange good practices, develop and implement trainings on national and European level as a tool for improving the teachers' qualification, to create a

positive and creative educational environment; to develop alternative teaching methods and include the use of informational technologies in the training process.

Training modules with an innovative elements, successfully built with partners and implemented with teachers through training courses, cover the following key areas: School Management, Classroom Management, Conflict Management, Intercultural Education, Emotional Intelligence, Career Guidance. Teachers are offered practical approaches and classroom management techniques to help build an inclusive and supportive environment for each child and to provide students with the opportunity to develop strong personal qualities and develop their social skills. Meanwhile the goal is to foster the development and establishment of cooperation, empathy and prosocial behavior in schools.

3.   *The essence of pedagogical innovations*

Overall innovations are a phenomenon which is the basis of societal development.

The term innovation comes from the Latin word „novatio", which in direct translation means "in the direction of change". The term innovation appears for the first time in scientific research in the XIX-th century and is related to the development of economics as a field in science.

Summarizing different definitions of the term innovation in economics we can conclude that *innovation* is the introduction of a new or upgraded already existing product (goods or services), or processes, a new marketing method or new organizational method in the occupational settings or relations with third parties.

"Knowledge accumulation is important for the development of innovation; building creative thinking human resources with new skills and knowledge; transfer of technology; knowledge sharing based on built-up scientific complexes, facilitated access to publications, open method of coordination " (Innovations.bg, p.14). Education with its public mission is naturally involved in the processes of creating and applying innovations. This offers quite a challenge for teachers' training on innovation and related skills. Some of the questions are how to introduce innovative practices which adequately address organizational and substantive issues in the educational process so that a "targeted, planned and controlled change" is made —(Ordinance 9 on Institutions in the Pre-school and School Education System, Art. 70, paragraph (2)) and how to address the innovation activity as "a new educational product or an improved process" (ibid., Para. (3)).

According the Law for Pre-school and School education (LPSSE) innovativeness in the pedagogical practice has several dimensions:

–   Innovational elements in regards to organization or/and content of the education;
–   Organizing of new or upgrades management of education and educational environment;
–   Including new ways of teaching;
–   Developing new curriculum, lesson plans and programs. (LPSSE, article. 38, al. (7)).

The need to synchronize education with the needs of society and innovative development is one of the reasons for the emergence of new structures. This is how educational clusters emerge. Educational clusters are a relatively new and not so researched phenomenon in pedagogical science. They are created in response to the contemporary needs of society and in particular education. There is a clear need for integration of institutions interested in the development of education and educational clusters provide such an opportunity. "Educational clusters could be seen as an effective tool for creating innovative educational and research environments. The innovative educational environment built into the teacher training process reflects directly on the school environment, which then becomes not only innovative but also transforms itself into a positive environment for learning, research and development" (Kozhuharova, 2018).

DIITT's structural model of an educational cluster for continuing education and teacher training is presented (ibid).

Analyzing the types of pedagogical innovation there could be several types of innovations which are defined in relation to:

- ICT application,
- Organization of educational activities in the schools and the educational process;
- Teaching methodologies;
- Personal growth and development of students.

Figure 01 presents an overview of a schematic model of pedagogical innovations.

Figure 01. Schematic model of pedagogical innovation

The most commonly used innovation is related to ICT application. It is no coincidence that they are placed at the center of the model – they correlated closely with the other three types - organizational, methodological and person-centered innovations.

In recent years, cloud technologies have been applied to the organization and management of the learning process in Bulgaria. The two major cloud services used in Bulgaria are: G Suite for Education и Microsoft Office 365 Education. Both application packages are free, and Office 365 also offers a paid version with additional offline functionality. They include tools for text processing documents, spreadsheets, presentations, a calendar for organizing and sharing engagements and events, and disk space for storing information in the cloud space. They enable teachers to create learning content, administer tasks and guide the learning process, creating conditions for creative and critical thinking among students. The applications also provide the opportunity for individual and group work on given problem (task). They contain tools to provide feedback and track students' progress in the learning process. In both services there are applications for creating contact groups to facilitate communication between the participants in the learning process. They influence directly the optimization of the organization of the school education activities and allow the diversification of the training methods.

In addition to cloud services, education process utilizes a number of cloud-based applications and platforms to support the learning process. Starting in 2018/2019 school year, the subject of Computer

Modeling was introduced in the compulsory curriculum in Bulgarian schools. Through the Scratch Visual Programming Program, available in an online and installation version, students can see the results of their own programming right away and can program interactive stories, games and animations, and share projects with other people in the online community. Algorithmic, logical and creative thinking and basic knowledge of programming are also formed in the children, enabling the integration of knowledge in different subject areas. Skills for team work are developed in a creative educational environment. (Kozhuharova & Topalska, 2018)

Along with cloud technologies, virtual reality applications and added reality are becoming more and more popular in the learning process. Virtual Reality (VR) allows the user to interact with a computer three-dimensional model or virtual environment ("Virtual Reality or VR allows a user to interact with a computer generated three-dimensional model or virtual environment") (Christou, 2010). It creates a simulation of a three-dimensional world in which the student can move and manipulate in different ways. Therefore, VR can be used to study objects and processes that cannot be viewed in real term. Augmented Reality (AR) is **"**the ability to superimpose computer graphics on the real world"(Billinghurst, 2002). In AR students see reality along with virtual images. AR uses virtual Information) additional information from a source: internet or an application) and superimposes it on the picture or an object form the real world and by doing so presents students with "additional information on quality and characteristics of the object which are not seen with "the naked eye" (Pencheva & Mitev, 2012).

Innovations related to learning and teaching methods are based on a constructivist approach in education. At the center of all are the individual transformations in the learning process, the self-learning of knowledge through active action by the students, the research approach and the related active and interactive methods of learning and teaching.

Innovation areas for personal development of students and teachers are related to the positive interactions, community support, income coaching, social emotional learning, emotional intelligence (mindfulness, self-management, social knowledge, and relationship management), and partnership with parents, student leadership, and others.

There is growing interest toward research in this area, which confirms this trend. Much of the country's current research focuses on relationships, personal development, interaction in the school environment (Donev, 2018).

Research Methods

The research methods used in the work are:

-        *theoretical analyses* of scientific literature on the essence of innovations, their role, place and functions in the pedagogical innovations, opportunities and good practices for development and application of pedagogical innovations;

-        *modeling* – a model of a structure for pedagogical innovations is presented;

-        *questionnaires* for evaluation of teachers 'attitude toward innovation application in educational process

-        *summary* of the theoretical and empirical data.

Research Questions: Results from the research on teachers'attitudes toward innovations in the process of education

Teachers' attitudes towards the application of innovations in the learning process were investigated through an electronic questionnaire in Google application – Google Forms. The poll was created specifically for the purpose and in accordance with the necessary requirements.

The survey was conducted in January - February 2019, and included125 teachers from all levels of secondary education (from kindergarten to 12 grade) on a voluntary basis. They sample is evenly distributed across all educational levels. The results are summarized as percentages. Figure 02 presents the answers to the question "Your motivation to increase your professional qualification in relation to applying innovations in education".

Figure 02 shows that only 7.63% define their motivation as average. No one answered "low" and "I do not want to upgrade my innovation qualification". A predominant 92, 37% have a very high and high motivation to apply innovation in education. Such statistics show that prerequisites and interest have been created for teachers'further qualification in relation to the development and implementation of innovative practices and their readiness to use them. The results also lead to the conclusion that the need for innovations and changes in the learning process are already recognized by the teachers and they are willing to look for new forms, methods and tools to respond adequately to the challenges in their pedagogical practice.
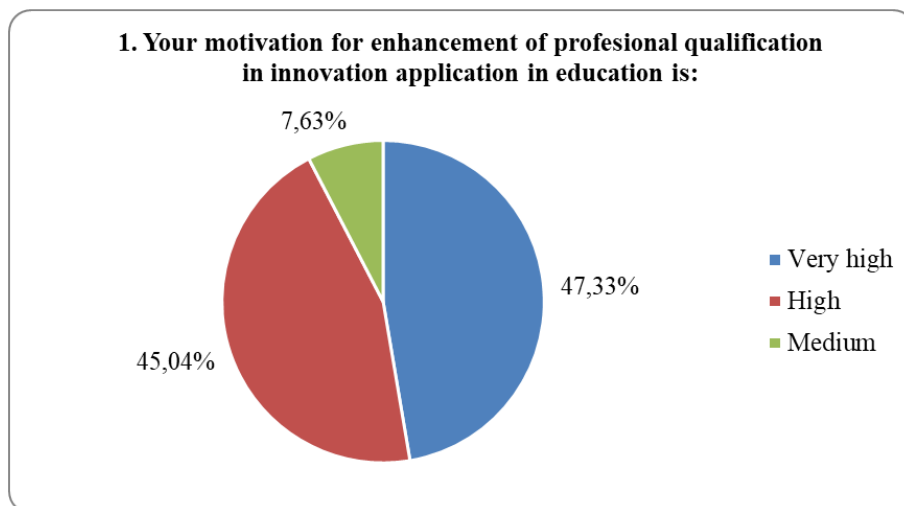

Figure 02. Motivation for further teacher qualification

Question 4 "In your work you apply which areas of innovations: ... " aims at exploring the of teachers' opinion on knowledge and application of different types of innovation, allowing for more (Figure 03).

As low as 6.87% of participants answer that they do not apply innovations. The highest percentage - 73.28% seek and apply innovations in direct learning through innovative teaching methods.
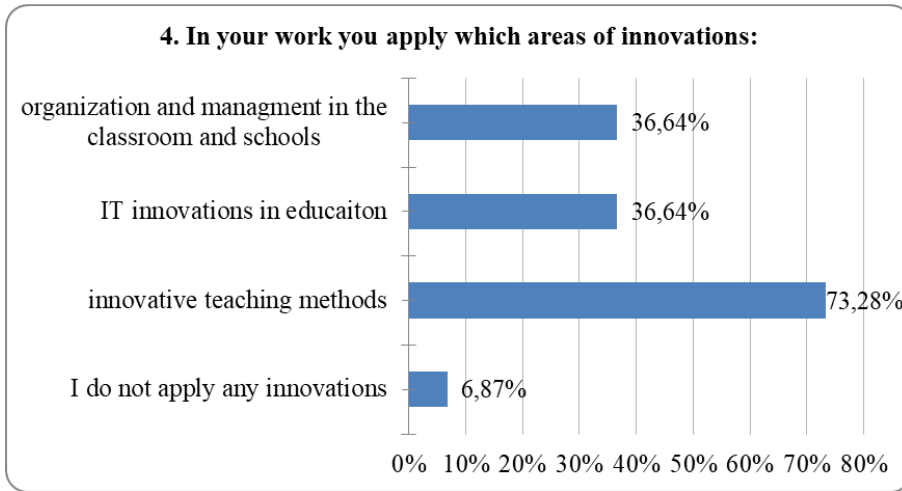
4. In your work you apply which areas of innovations:

organization and managment in the classroom and schools	36,64%
IT innovations in educaiton	36,64%
innovative teaching methods	73,28%
I do not apply any innovations	6,87%

0% 10% 20% 30% 40% 50% 60% 70% 80%

Figure 03. Areas of application of innovations

Application of innovation by type and according to ages

	above 50 years old	between 30 and 50 years old
I do not apply any innovations	2,86%	6,67%
innovative teaching methods	68,57%	71,11%
IT innovations in educaiton	37,14%	40,00%
organization and managment in the classroom and schools	31,43%	42,22%

0% 10% 20% 30% 40% 50% 60% 70% 80%

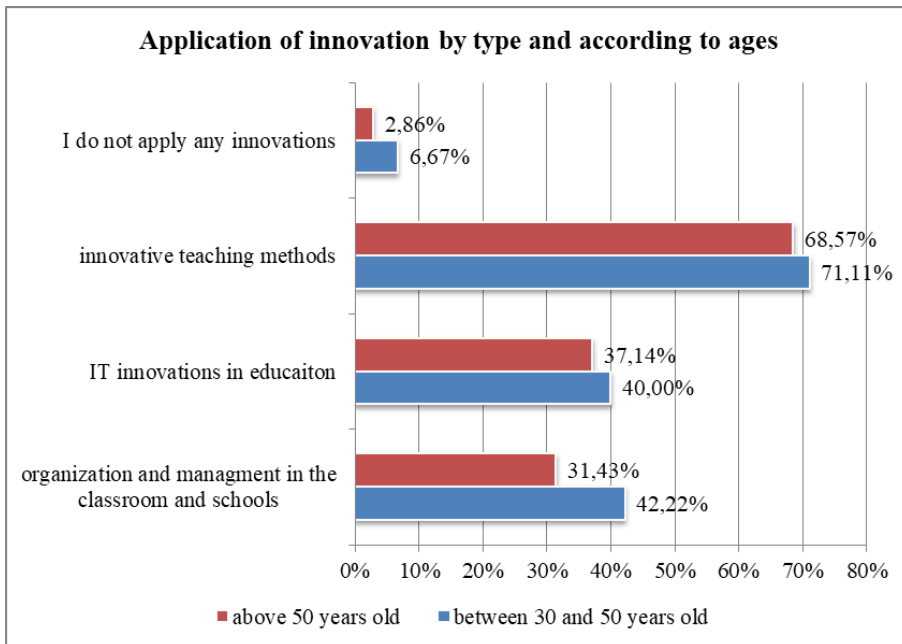■ above 50 years old ■ between 30 and 50 years old

Figure 04. Application of innovation by type and according to ages

Investigating whether there is a correlation between teacher's age and the field of application of innovations shows that there is no significant difference in percentage (Figure 04). The difference between the ages is most obvious (about 9%) in innovation application of in the organization and management of schools or classroom processes in favor of younger teachers ages 30 to 50. It is likely that this group, which is still in the process of establishing their style of teaching and attitude towards learners, is more likely to have readiness for flexibility and adaptability to the new realities in the educational space and to search actively for effective ways of realizing harmonious and productive interactions with students and colleagues. Such teachers who have upgraded their methodological experience so far, to some extent have

also had an impact on innovation in teaching. As a result they have been able to develop skills for a class manager and managing the different processes that take place in the classroom - from classroom dynamics to communication with parents – and are continuing to grow professionally and work on mastering their pedagogical skills.

In terms of the educational level and the most often applied type of innovation, interesting results are outlined (Figure 05). The "other pedagogical specialists" category includes school leaders, psychologists, pedagogical counselors and special pedagogues. This explains their least involvement in the implementation of innovations related to teaching. They in turn use the most innovations related to Information Technology.

The most innovative methods are used by teachers in high school level, which is not a surprise, considering the specificity of the age group they work with. Young people for whom high school years are the last mandatory years for education have already formed a worldview, identity and some vision for the future. They are more aware, more critical, more provocative and more demanding. It is not by accident that at this age stage the teacher's authority is most strongly recognized as that of an expert in his / her area of knowledge. They appreciate what a pedagogue can give them as a professional, and this prompts the teacher to constantly update his or her way of teaching.

The highest percentage (50%) of those using IT innovations are the group of 'other pedagogical specialists', and pedagogues of pre-primary education. As mentioned above, the very specificity of the functions of other pedagogical specialists requires the application of this kind of innovations in their practice, given the work with software products, electronic communication and the use of IT in the broad spectrum of their activities, which is significantly different from that of teachers.

The same result obtained with kindergarten teachers is interesting in terms of their understanding of what "IT innovations" are and how they use them. Interactive boards are faster "spreading" in kindergartens and at this time almost all of the preschools and kindergartens have multi-media equipment as well. Striving to respond to the contemporary reality in which children come to kindergarten with a phone, tablet, or other device, teachers are looking for ways to form skills for their moderate and wise use, and at the same time strive to be "literate enough" in the field IT. Of course, this is just an assumption that could be further explored.
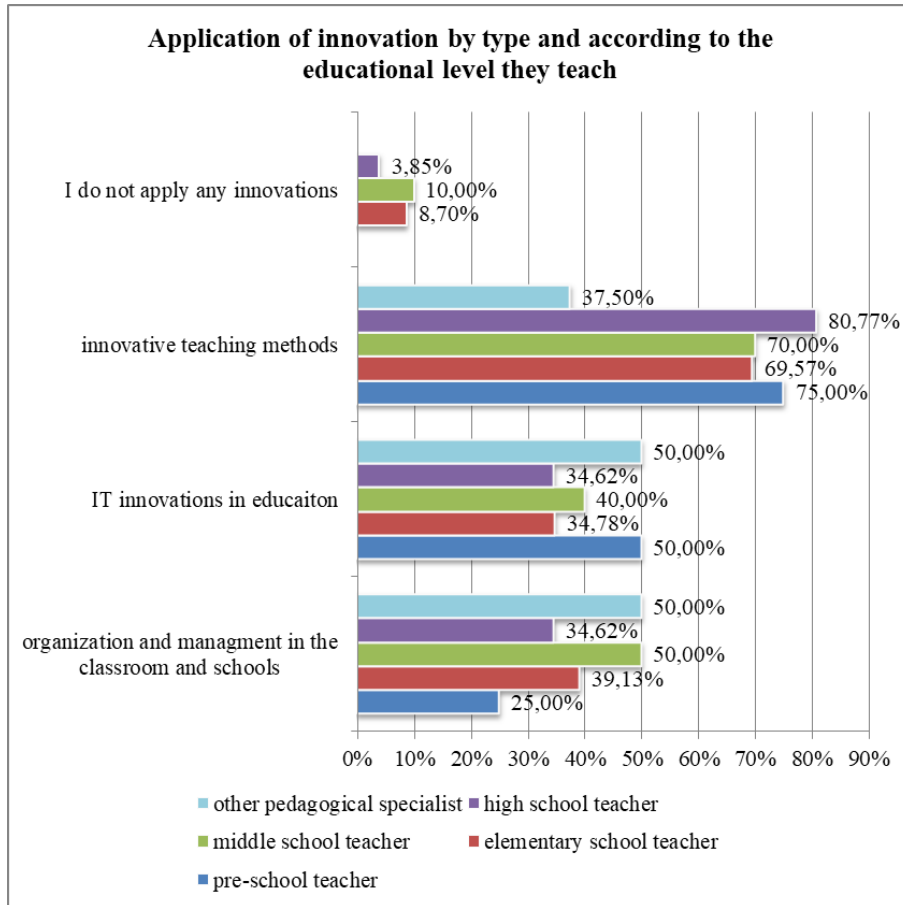
Figure 05. Application of innovation by type and according to the educational level they teach

In terms of innovations in the organization and management of school processes and in the classroom, the highest percentage applies to "other pedagogical specialists" (as already noted - managers and assisting professions at schools) and also lower secondary school teachers. For the first group, these innovations are an integral part of the functions deriving from their position. For junior high school teachers, classroom management, classroom processes and the organization of activities lead to an effective outcomes and are important necessity. When students are in 5th-7th grade their developmental needs related to the specificity of their age requires a reorganization of pedagogical resources, a new approach to the student's personality, a balance between the different styles of attitude and interaction with the student. This age, called "period of storm and stress", emerges as the most dynamic and challenging in the psychological and pedagogical aspect, and the management of relationships, conflicts, communication, personal development, and learning requires a dynamic approach and innovative insight. This is also argued by the wider application of this kind of innovation at the lower secondary level.
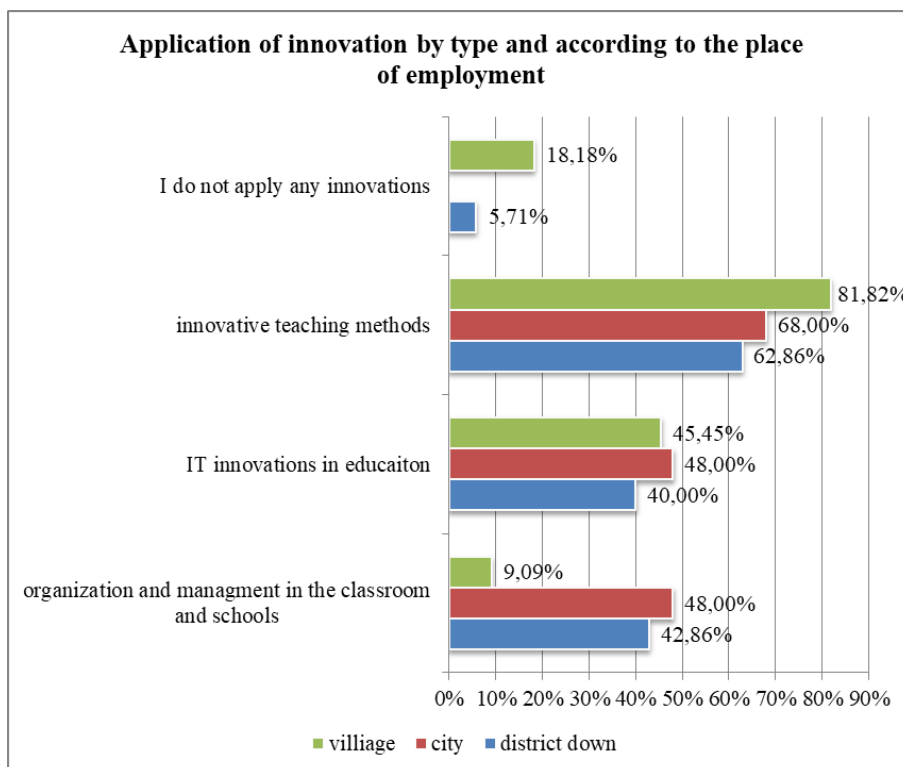
Figure 06. Application of innovation by type and according to the place of employment

According to the percentage of responses according to the place where teachers work, it appears that IT innovations are almost equally applied in district towns, particularly large cities and villages (Figure 06). In the villages most of the innovation related to teaching is also applied. This is understandable given the issues that these areas have with the prevention of premature student drop out. In the above-mentioned EMPAQT project, thetopic has been broadly deployed, and various innovative strategies have been proposed in the project, specifically in solving this problem

Innovation in managing and organizing school processes is most prevalent in medium-sized cities and is hardly used in villages. The village is a community, there is no anonymity, the communication between the direct participants in the school life – students, teachers, parents, eventually community center and mayoralty – is direct, clear and permanent. This makes the processes more predictable, their management more routine, and the changes are less dynamic and require a rapid response to them.

The highest rate of implementation of these innovations in medium-sized cities is explained by the fact that many children from nearby villages study there, while mainstream education authorities are located in the district town, some of the teachers travel. Parents from small towns usually work in bigger towns/cities. Children's free time arrangements, day-to-day training, communication and other basic pedagogical activities must be innovative in response to the above-mentioned challenges. Because of this, the need to organize, coordinate and control the processes is obvious.

Purpose of the Study

The goal of the current research is to present the outcomes of a practical experience to summarize the types of innovation in educational system in Bulgaria and their application in the pedagogical

qualification of teachers in all levels of education**.**The article presents the policy on pedagogical innovation in Bulgaria, presents a model for classification of such innovation and the practical experience of implementation in a long-term teacher training.   It also presents the inquires on attitudes toward implementation of innovative processes in education conducted among a targeted group- teachers in different areas of expertise and in different levels of educational system – from kindergarten to 12th grade.

Findings

− National policies and strategies on educational innovations foster processes of their implementation in pedagogical practices.

− Social and economic development determines the needs for classification and implementation of pedagogical innovation in the process of pedagogical qualification and training.

− The presented model for application of pedagogical innovation needs further research and improvement in regards to the teachers' and students' attitudes and the development of further technological and social competencies for their application.

− The innovative educational environment created in the pedagogical qualification of teachers influences directly the school environment which then becomes not only innovative but explorative and positive educational environment fostering personal development, inviting gaining, retaining and use of knowledge from learning.

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Conclusion

The contemporary teacher realizes his/her pedagogical responsibility and is ready to meet the challenges of a dynamically changing educational reality. This is a continuous process of seeking new approaches, methods and tools that will increase his/her professional efficiency. He/she uses qualifications and design products offering innovative strategies for pedagogical interaction, training, organization and management of the school environment and community. He/she determines the need and the area for improving his/her qualification and applies the pedagogical innovations according to the needs and specifications of the students and the context in which he/she works – position, type of school, populated place.

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