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Virtual Reality – Part of Supervised Teaching Practice for University Students – Future Teachers?

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Abstract

The submitted study is of theoretical-empirical character. The theoretical part defines given key terms related to the issue of supervised teaching practice for future teachers. In addition to a brief characterisation of supervised teaching practice, attention is paid to the position and importance of information and communication technologies in the life of young people today. There is a brief definition of virtual reality and the attention of the study is focused on its using by young people, especially university students. The empirical part contains partial results of our own empirical study executed via a quantitative analysis of data acquired through online questionnaires, in which students of teaching answered questions related to using virtual reality during their supervised teaching practice. The acquired data were analysed by a statistical software called SPSS 20. The interpretation of results related to the given issue is based on the results of univariate, bivariate and multivariate data analyses. Multivariate data analyses was realized by correspondence analyses and the most important results of our research are illustrated in the graph of correspondence analyses – correspondence map. The main goal of the study is to emphasize the possibilities and methods of utilising virtual reality in supervised teaching practice for university students – future teachers.

Keywords: education, supervised teaching practice, university students, virtual reality.

1. Introduction

University education of future teachers is an integral part of the young people's preparation for the teaching profession. The job of a teacher, who not only educates but also shapes future generations' character, is very demanding. Through his or her activities, every teacher should communicate to children and youth the generally accepted social norms and values. For this reason, it is important to ensure that the preparation of future teachers corresponds to

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contemporary social development. What becomes important is not only the content and focus of the pre-graduate preparation but also its character. The efficiency of future teachers' education can be achieved by an ongoing improvement of the educational process at a university. Today, this process can be aided by various modern information and communication technologies and their extensive utilisation in the educational process. Because the university education of future teachers includes the realisation of supervised teaching practice, the gradual penetration of modern information and communication technologies will apply to this area as well. As a result, this study would like to introduce some possibilities and methods of using information and communication technologies to improve the supervised teaching practice's efficiency.

Supervised teaching practice

"The goal of supervised teaching practice is to gradually change a student's attitude to the attitude of a teacher. It enables future teachers to acquire basic pedagogical skills necessary for the teaching profession." (Dytrtová, 2009: 73). Through supervised teaching practice realisation, a university student ceases to look at the educational process in the chosen type of school from a student's point of view. Over time, a future teacher starts to realise the importance of particular activities closely connected to the teaching profession. Based on the stated general characteristic and the subsequently set goal of supervised teaching practice, we can summarise the main tasks of this practical part of future teachers' pre-graduate preparation (Dytrtová, 2009: 73):

- motivating students for the teaching profession;
- developing students' pedagogical thinking and the ability to apply the knowledge of psychology in their work with pupils;
- applying professional education into a school reality;
- developing the ethical part of a teacher's personality in the context of social communication;
- developing the organisational and managerial skills of future teachers.

In our opinion, one of the main tasks of supervised teaching practice is to motivate students of teaching to perform their future teaching profession. Only by participating in supervised teaching practice during their university study, students – future teachers can become acquainted with the educational reality and, at the same time, be able to see the true essence of the educational process from the teacher's point of view. Through recognising the importance of the role teachers play in the process of educating and shaping future generations, students' motivation for the teaching profession develops. On the other hand, we should emphasize that, in some cases, it is the contact with educational reality from the position of a teacher that can actually demotivate students of teaching to continue on their chosen path. When changing the point of view from a student to a teacher and realizing the demands placed on the teacher in educating children and youth, a student of teaching might start doubting his or her ability to optimally and adequately participate in the educational process as a teacher.

In addition, we would like to emphasize that supervised teaching practice develops future teacher's pedagogical thinking (Danek, 2019: 32). Pre-graduate preparation of teachers provides students with a great deal of information connected to the essence of the educational process. By participating in supervised teaching practice, students of teaching develop their organisational skills as they will have to know how to independently organize their classes in the future.

During his or her supervised teaching practice, a university student preparing for the teaching profession should focus his or her pedagogical activities mainly in the following way (Dytrtová, 2009: 73-74):

- to clearly and explicitly formulate educational goals to pupils;
- to effectively organise classes;
- to use the content in compliance with the educational program;
- to deliver the content to pupils effectively and correctly;
- to use adequate methods;
- to use connections between subjects;
- to engage and maintain pupils' attention;
- to shape pupils' character;
- to objectively evaluate pupils;
- to approach pupils in a helpful way;
- to develop and support pupils' independent activity;

- to create an optimal atmosphere during classes;
- to express himself or herself exactly and terminologically;
- to use adequate verbal and written expression;
- to pay attention to his or her non-verbal communication;
- to evaluate his or her performance based on a consultation with the practice teacher.

In our view, it is important for a future teacher to be able to acquaint pupils with the educational goals even during practice teaching. A university student must know exactly how to explain the focus of the education to pupils as clearly as possible. At the same time, he or she should know how to organise the classes, which means to divide the lessons into parts, one in which he or she explains a given topic to pupils and another one in which the key facts are revised. The optimum course of a class is determined by suitable methods of teaching as well as by appropriate material tools facilitating an efficient delivery and revision of a particular topic. Only by participating in supervised teaching practice can future teachers form their professional approach to those being taught. The professional approach of future teachers lies mainly in an objective evaluation of pupils. A future teacher must view every pupil objectively and not based on his or her own feelings. It is the supervised teaching practice that offers students of teaching their first contact with more pupils from the position of a teacher. Based on the gradual acquisition of a teacher's position, a university student – future teacher becomes aware of why the objective approach to each pupil is important. Last but not least, we should emphasise the significance of using exact terminology. It is important for a practising student to influence pupils via his or her verbal as well as non-verbal expression.

It is possible to say that "by participating in supervised teaching practice, university students become gradually involved in the interactions taking place among the team of educators. The practice helps to increase students' independence and responsibility in activities related to the teaching profession" (Michvocíková-Sirotová, 2019: 230). A future teacher gradually develops his or her ability to lead the educational process. While doing so, a trainee must act decidedly and with confidence, must be sure of his or her decisions and be able to promptly justify his or her actions. In our opinion, the necessary confidence to lead the education process can be achieved by participating in the teaching practice in a simulated environment of a practice school through virtual reality.

Virtual Reality

In the last several years, contemporary society has been experiencing an ongoing progress in many areas related to more or less regular interactions of people with other individuals or social groups. Interactions between two or more members of society can be considered a necessary precondition of human existence and its continuation. A contact between individuals or between various groups takes place constantly and has various forms. The course of social interactions is nowadays determined, among others, by the development of information and communication technologies, creating a specific environment that requires no physical contact or presence. We are talking about an online world. The online world enables an interaction with other people through virtual reality (Shultz-Shultz, 2017: 6). An online contact – a contact of individuals without physical presence creates a specific reality referred to as virtual reality. Virtual reality is formed by interactions between individuals or groups that take place based on an online contact – a contact without physical presence. The development of modern technologies facilitates communication and subsequent interaction of individuals or groups in virtual reality without the need for the participants to be congregated in a particular place at the same time. The virtual environment, and the reality existing within, cross the borders between time and space. Mentioned virtual space is created by digital technologies (Jursova, 2015: 261). The birth and subsequent development of virtual reality is determined by the hardware and software platform we call the Internet. "The Internet as a worldwide heterogenous computer network, in its essence, represents not only a huge source of memory and computing capacity, but its popularity among lay users grows rapidly mainly due to its multimedia possibilities of accessing information and communication." (Práznovská, Stupka, 1999: 51). As a result of the spread of the Internet, the use of virtual reality is growing as well. In the past, the Internet had not been a common and automatic part of everyday life. Its use had mostly been connected with work responsibilities and it, surely, hadn't been as automatic as it is today. The initial work-related use gradually spread to the consumer area.

The internet collects a huge amount of information and the access to it is easy, which was something that users of all age groups quickly realised. The last few years have brought a huge growth in the area of accessing virtual reality through social networks. The results of foreign studies have shown that an excessive amount of time spent on social networks can induce depression among young people. What also suffers are their personal feelings and the overall quality of relationships with others (Lam-Peng, 2010; Blais-Craig-Pepler-Conooly, 2008; Huang, 2010; Kross, 2013; Schultz-Schultz, 2017: 7; Malach, Chmura, 2017: 97). On the one hand, we can argue that communication through social networks represents a fast and effective mode of interchange which, as had been stated above, is not tied to a certain time, space or physical presence of the individual participants, on the other hand, we agree with the results of the stated studies. In our view, young people spend too much of their free time on social networks. In this case the online communication does not represent an efficient way of personal interaction. A generation is gradually being formed for which a life in virtual reality of social networks is very important. In virtual reality, everybody tries to present himself or herself in the best possible light, devoid of any shortcomings or realistic image. Virtual reality often does not reflect true reality. As a result, young people are often discontented, depressive, lacking necessary confidence in communication with the real world. Another expert, trying to draw attention to the problem of young peoples' excessive use of social networks is Johnston. He refers to the generation born between the years 1984 and 1994 as the "net generation" or "digital natives". This generation is submerged into the world of digital technologies and prefers using the Internet or mobile devices in communication (Johnston, 2010: 7). We agree with the use of the above-stated terms but believe that in connection with the extensive use of the Internet and mobile phones, it is necessary to move the upper age border of the "net generation" or "digital natives". According to Vagnerová (Vagnerová, 2012: 469), "adolescents are attracted to the virtual world with its clearly set rules, in which they don't need to reveal their identity, or only if they want to. They can experiment with various, often realistically unattainable, images of themselves. This is not possible in real relationships. Internet chatting does not require any social correction, an adolescent can impersonate anybody and satisfy his or her needs in a way that is unacceptable or unavailable in real life." We believe, however, that the virtual world is becoming attractive not only to adolescents but also to young people whose personality development is in the phase of early adulthood. This also includes university students. As a result, we can say that for university students, too, the virtual world is becoming an integral part of their everyday interactions. Unlike younger adolescents, university students' view of virtual reality is partially different. University students' personality development has passed through the phase in which a maturing young person needed to idealise his or her own identity in an anonymous online space. We are supposing that the majority of university students' priority is to successfully finish their university study. In most cases, young people subordinate their actions to this goal. A university student thinks about the ways of streamlining the study while realising the importance of communication technologies. University students, in our opinion, see virtual reality as one of the ways to optimize their university study. For students, the availability of the Internet represents the availability of much of the required information related to the content of their study. For this reason, we would like to draw attention to the gradual utilisation of digital technologies in the area of education. These technologies mainly relate to the collection, recording, subsequent storing, processing and exchanging different pieces of information (Kostrub-Severini-Marher, Milovčiková, 2014: 80-81, Vasbieva, Saienko, 2018: 127). For students, using modern technologies in the educational process represents a simpler way of acquiring and recording particular information. Using a notebook or a PC becomes a necessity and a common occurrence. Notebooks, in particular, enable students to quickly record the content of teaching and the subsequent distribution of notes from lectures, seminars or exercises among other students through social networks, e-mail, etc. As a result of identifying the importance of virtual reality in young people's lives today, we expect that virtual reality is going to gradually penetrate into educational processes, as well. Because young people see virtual reality as an environment that feels natural, its utilisation in education becomes necessary. For example, 3D visualisations became a suitable tool of interactive learning. Integrating virtual reality into education makes learning more accessible and efficient (Parisy, 2016: 8). The efficiency and accessibility of education is, in our opinion, possible also in the area of supervised teaching practice. In particular, we can mention visualisations of various pedagogical situations in virtual

reality. As virtual reality is becoming a natural environment for young people today, simulating particular pedagogical situations into a virtual space and subsequently searching for solutions to these situations would help future teachers to acquire necessary confidence that could be put to the test during supervised teaching practice at a real practice school. University students – future teachers are able to independently orient themselves in the online space, and the decisions they make in virtual reality are also marked by a high level of independence. As a result, we see 3D visualisations of chosen educational situations as a suitable method for learning adequate solutions to these situations. In virtual reality, possible mistakes (incorrect decisions) don't have serious consequences. This simulated space can show a future teacher the potential consequences of his or her decisions. At the same time, we suppose that university students are evolved enough to be able to differentiate between a virtual space and true reality and to realise the importance and consequences of their independent decisions in the position of a teacher.

Another potential use of virtual reality during pre-graduate preparation of teachers are online courses for future teachers. Students see high-quality online courses as a good method of going deeper into areas where they had learned the basics. The basics need to be learned live from somebody who understands the subject (Novotná, 2019: 108). Online courses led by a practice teacher could acquaint students with the course of supervised teaching practice in the environment of the practice school and help them better prepare for the educational reality. The question remains, if online courses for future teachers should precede students' participation in a real educational process at a practice school or should serve only as an accessory to collecting feedback related to the efficiency of the said educational process.

It can be concluded that the penetration of modern information and communication technologies is visible in all areas of everyday life, and because university education is an integral part of our social system, it makes sense to use these technologies in university education as well. This applies to all existing study programs. Information and communication technologies are not only one tool for learning. It is necessary to integrate their using in the traditional educational system (Švarbová, Bírová, 2009: 34). We especially emphasize the use of virtual reality by students of teaching because, as had been stated above, during supervised teaching practice, future teachers are expected to act decisively and with confidence. As a result, we believe that in the course of a few years, we are going to witness new innovative ways of realising supervised teaching practice based on linking virtual with true realities.

2. Materials and methods

In the course of an empirical study related to the given issue, we have addressed 70 university students – future teachers. Addressed university students were students of university field of study in Slovak Republic – "Teaching and Pedagogical Sciences". Respondents had not had an opportunity to specify their place of study in Slovak Republic in the online questionnaire. We can state, that online questionnaire were addressed to university students of "Teaching and Pedagogical Sciences" field of study at Universities in Slovak Republic.

The prepared questionnaire contained ten questions. According to the focus of our study, we have analysed selected issue by analysis of two questions of mentioned questionnaire. The analysis of the recorded answers was executed through univariate, bivariate and multivariate data analyses using the SPSS 20 software. We have realized univariate data analysis by first-level data sorting. We generated the illustration of first question analysis. Mentioned illustration shows the count of received answers of first analysed question clearly. It is the most importance of univariate data analysis. Moreover, we have realised bivariate data analysis by second-level data sorting using the SPSS 20 software. We defined two statistical hypothesis – null and alternative hypothesis. In the process of hypothesis verification, we determined significance level (α) by the statistical software SPSS. We are talking about the probability of null hypothesis validity (significance level α is 0,05 in the SPSS). We are not assuming the null hypothesis validity in the case of computed value of significance level is lower than determined significance level α. Subsequently, we are assuming the validity of null hypothesis alternative with the probability of 95 % (Ritomský, Solar, 2002: 134-136). Finally, we have realised multivariate data analysis using the SPSS 20 software. In our opinion, one of the important statistical analysis of multivariate data analysis is correspondence analysis. Mentioned data analysis is based on multivariate analysis of

contingency tables. The graphical output of correspondence analysis is correspondence map. There is an exact graphical views of statistical dependence of examined variables in the correspondence map.

3. Results and discussion

Through an online questionnaire, the respondents were asked questions focusing on the general use of information and communication technologies in personal life and during their university study. We have also studied student's attitudes and opinions of the complementarity of a virtual and the real space in the realisation of supervised teaching practice.

During the initial study of the given issue, we were interested if students saw the use of modern information and communications technologies during supervised teaching practice as necessary. The collected results can be seen below (Figure 1).

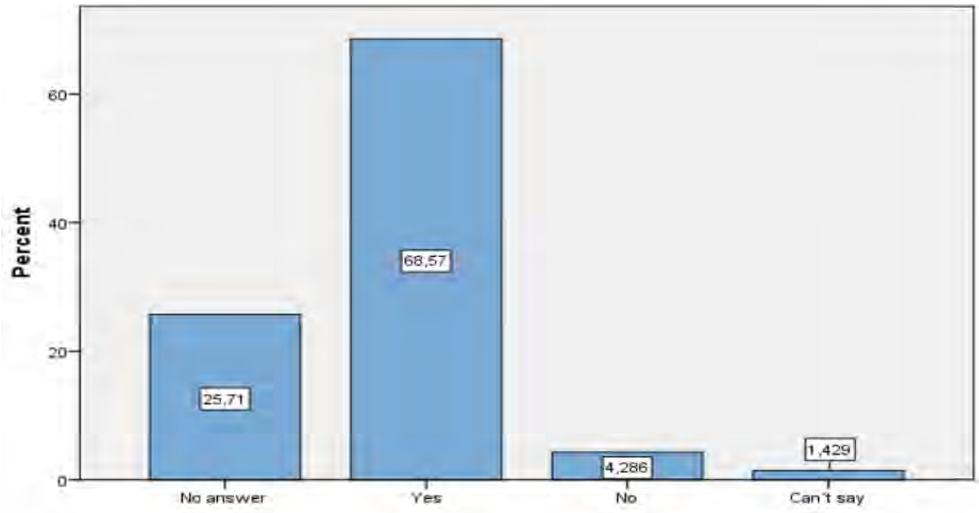

Fig. 1. Expanding the use of information and communication technologies during supervised teaching practice

We can say that the vast majority of future teachers – 69 % pointed to the need for a greater use of modern information and communication technologies during supervised teaching practice. University students – future teachers belong to the generation that grew up in the age of technological progress, during which information and communication technologies gradually became an indispensable part of everyday reality. For a generation labelled as the "net generation", using modern information and communication technologies in various forms became entirely natural, even in the area of university education. Since supervised teaching practice is an integral part of future teachers' university education, more extensive use of information and communication technologies is needed in this area as well, mainly by employing virtual reality.

Based on respondents' opinions related to the need for greater utilisation of modern technologies during supervised teaching practice, we have also studied potential ways of using the virtual space for the optimization of the teaching practice. In the context of the above-said, we have focused on collecting students' opinions related to the possibility of becoming acquainted with the characteristic of chosen educational situations taking place in a school reality through a virtual space.

Our goal was to find out if the above-stated simulations of chosen educational situations common in the school environment can be considered one of the ways of introducing modern information and communication technologies into supervised teaching practice in a more extensive way.

According to the above-stated text, we realized bivariate analysis of collected data by statistical software SPSS 20. We defined two statistical hypothesis – null and alternative hypothesis:

H_o – We assume, that there is no statistical dependence between Expanding the use of information and communication technologies in the process of supervised teaching practice and Simulating chosen situations from educational reality into a virtual space by surveyed university students opinions.

H_a – We assume, that there is statistical dependence between Expanding the use of information and communication technologies in the process of supervised teaching practice and

Simulating chosen situations from educational reality into a virtual space by surveyed university students opinions.

Table 1. Chi-Square Tests

	Value	df	Asympt. Sig. (2 sided)
Pearson Chi-Square test	39,415	9	0,000
N of valid case	70		

The computed value of Chi-Sqaure is 39,415. There is the critical value 16,9 at nine degrees (df) in the significance level $\alpha = 0{,}05$ (The table of Critical Values – Hendl, 2006: 398-399). The contingency coefficient is 0,600. Mentioned value indicated relatively strong degree of statistical dependence. Based on the data above (Table 1: $p < \alpha$ – computed value of significance level p is 0,000 and it is lower than determined significance level α: $\alpha = 0{,}05$; $0{,}000 < 0{,}005$), we are not assuming the validity of null hypothesis (H_0) and subsequently we are assuming the validity of null hypothesis alternative (H_a) with the probability of 95 %. We can state, that surveyed university students supporting the idea of expanding the use of modern information and communication technologies in supervised teaching practice also found simulating chosen educational activities into virtual reality meaningful.

The results of a bivariate data analysis can be found in the following table (Table 1).

Table 2. Expanding the use of information and communication technologies in the process of supervised teaching practice and simulating chosen situations from educational reality into a virtual space

Simulating chosen situations from educational reality into a virtual space		Expanding the use of information and communication technologies in the process of supervised teaching practice				Together
		No answer	Yes	No	Can't say	
No answer	*Number*	6	3	0	0	9
	%	8,3	4,3	0,0	0,0	12,3
Yes	*Number*	3	35	0	0	38
	%	4,3	50	0,0	0,0	54,3
No	*Number*	6	4	3	0	13
	%	8,6	5,7	4,3	0,0	18,6
Can't say	*Number*	3	6	0	1	10
	%	4,3	8,6	0,0	1,4	14,3
Together	*Number*	18	48	3	1	70
	%	25,7	68,6	4,3	1,4	100

Based on the data in the table (Table 2), we can say that 50 % of respondents supporting the idea of expanding the use of modern information and communication technologies in supervised teaching practice also found simulating chosen educational activities into virtual reality meaningful. The simulations concern educational situations that might occur during the realisation of supervised teaching practice and students would review them before staring their practice. For young people today, the virtual space, in our opinion, represents an important place for interacting. For this reason, the said group of people might consider virtual reality the optimal possibility for getting acquainted with the characteristic of some situations of the educational reality. On the other hand, we would like to draw attention to a group of respondents (4.3 %) who expressed their satisfaction with the use of modern information and communication technologies during supervised teaching practice but disagreed with the potential method of learning about chosen educational situations likely to take place during future teaching practice through virtual reality.

Since we have identified a mutual dependency of the researched answers, we focused on a multivariate analysis of the data. The results of the multivariate data analysis can be observed on

the graph below. In a transparent way, the graph groups the positive answers to both questions on one side, and on the other side, it groups unanswered questions and answers through which students disagree with the expansion of modern information and communication technologies into supervised teaching practice as well as with simulating chosen educational situations into virtual reality. The multivariate analysis of data clearly confirms and emphasizes the previous results of our research.

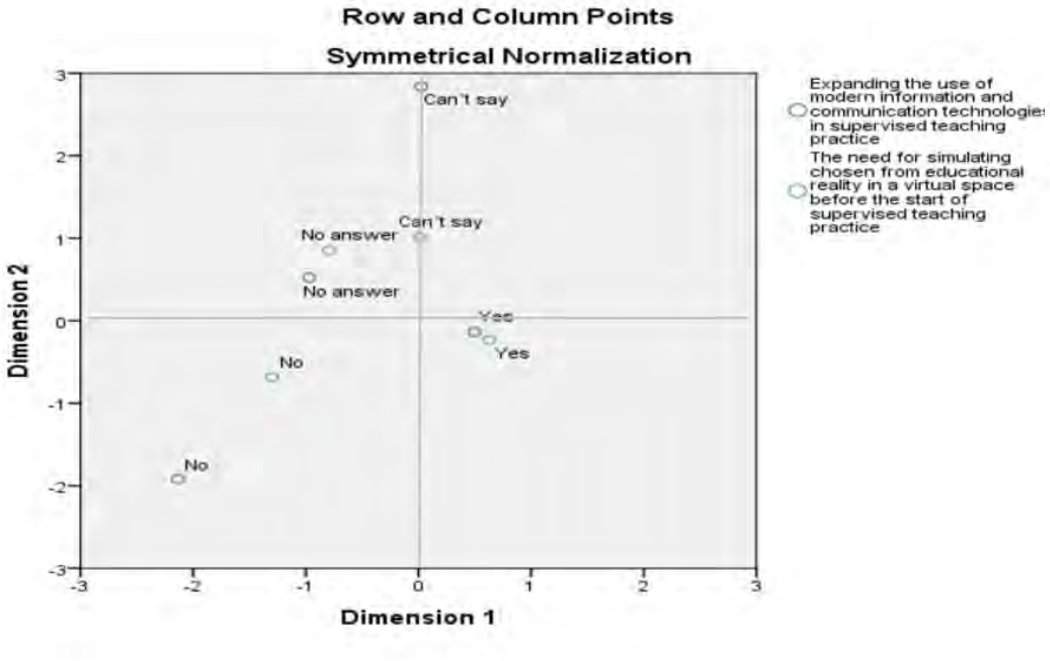

Fig. 2. The correspondence map of the multivariate data analysis

In contemporary society, the use of modern information and communication technologies became an integral part of young peoples' everyday interactions. This group of people includes university students preparing themselves for their future profession. Young people – university students use modern technologies everyday mainly for personal communication. In recent years, the wide spectrum of modern technological devices used by young people has included various ways of participating in the university educational process. University education is a necessary precondition of many professions, including the teaching profession. The professional preparation of future teachers at universities consists of theoretical acquisition of necessary knowledge but also includes a practical preparation in the form of supervised teaching practice. The area of pre-graduate preparation of future teachers is also experiencing gradually increasing integration of information and communication technologies into education. As has been said above, young people are accustomed to using modern technologies and that's why students see their integration into the educational process at a university as a positive process, in some cases even rather insufficient.

Since virtual reality can be considered an inseparable part of young people's lives, it is, in our opinion, necessary to integrate it into supervised teaching practice for future teachers. If we ask ourselves what would be an efficient method for gradual integration of virtual reality into supervised teaching practice, we would like to, first of all, emphasize the need to use virtual reality before students start their supervised teaching practice. University students who regularly participate in online interactions would benefit from the transformation of typical educational situations into virtual reality. This way, students would get acquainted with the characteristics, but also with the possible course or potential consequences deriving from the various educational situations typically occurring in a school reality. All of this would take place before students participate in their supervised teaching practice, rendering them better prepared for the practical training. The transformation of the real educational environment into virtual reality that represents the first contact of a future teacher with the educational processes from the position of a teacher can be considered an efficient method of students' preparation for their teaching practice.

Because virtual interactions are natural for young people today, their first contact with the educational reality from the position of a teacher through virtual reality would also be perceived as natural. The ongoing progress in the area of information and communication technologies makes it possible to use the virtual space for the purpose of stimulating the educational reality. It is necessary, in our opinion, for university students to learn to react to various stimuli that could be encountered in a school educational process mainly by solving educational quizzes or by playing educational computer games. These virtual reality activities would also require students' virtual self-evaluation related to the correctness of their decisions in reaction to given educational situations but also an assessment by a university teacher with subsequent feedback for the student. Moreover, we can outline limitations of our findings briefly. According to the low number of surveyed university students we cannot generalize our findings to the attitudes and opinions of all university students in Slovak Republic.

4. Conclusion

The focus of this study was to introduce some methods of optimizing supervised teaching practice for university students – future teachers via the use of information and communication technologies. The theoretical part of the study defined supervised teaching practice as an important part of pre-graduate preparation of future teachers. In addition, we have talked about the importance of using information and communication technologies today and emphasized the need for integrating virtual reality into university education for future teachers. Mainly, we have highlighted the gradual penetration of virtual reality into supervised teaching practice for future teachers.

The empirical part of the study focused on collecting university students – future teachers' attitudes and opinions related to the given issue. Using online questionnaires, we have assessed 70 students of teaching. The analysis of collected data was performed through a statistical software called SPSS 20. Based on the results of univariate, bivariate and multivariate analyses, we can emphasize the considerable benefit of integrating virtual reality into supervised teaching practice realization. The participating students of teaching are members of the generation that considers the use of information and communication technologies a natural part of their everyday interactions. As a result, future teachers see the partial simulation of chosen educational situations through virtual reality as a possibility to become better prepared for supervised teaching practice that takes place in a real educational environment of a high school. Since we see the gradual penetration of the virtual space into pre-graduate preparation of teachers as an inevitable reality, we believe that this issue requires more extensive research. The findings of our quantitative study can be considered a base for potential qualitative research executed through in-depth, semi-structured discussions aiming to collect future teachers' opinions about the benefits and shortcomings of using virtual reality to study chosen educational situations from a real school environment.

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