

Integration of Virtual Reality in the Instructive- Educational Process in Primary Education

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Abstract: Today's children live immersed in the digital environment and build in this environment connections, both social connections and connections with their fields of interest. The classroom could be that submarine that students sail safely in the ever-deeper waters of digital technology and the Internet and that will lead students on the fascinating journey of knowledge. How prepared are teachers and parents to be children's guides? The aim of this paper is to identify the availability of teachers who teach in primary education and parents who have children enrolled at this level on the use of virtual reality in education, more precisely in the instructional-educational process. The research findings support both the positive opinions of teachers and parents regarding the use of virtual reality in education, and their willingness to integrate this type of technology in the instructional-educational process.

Keywords: *virtual reality, virtual educational environment, digital resources.*

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1. Introduction

1.1. *The chapter of introduction*

The 21st century can be described as the age of digitalization and computerized transformations, transformations that are present in all spheres of life. It can be said that the period of Socratic teaching is fading faster and faster. Today, with the help of digital resources, every person can be given the opportunity to be their own expert, anywhere and anytime. The Internet, along with digital resources, urges teachers and students to choose their areas of interest and the information that attracts them. Nowadays, many students in the classroom master some content much better than their teachers because this period of digitization offers, with the click of a mouse, the opportunity to search for a wealth of information without being tiring and requiring many trips to the library. We are in the century when technology knows no bounds. Thus, current students can be called "digital learners" (Schipor et al., 2014).

As it is known, in most cases, teaching is done through the transmission of knowledge from teacher to student, the teacher being the person who fully directs the educational activity. Also, the teaching materials used, such as worksheets, are static. Although in most cases this way of conducting lessons gives results, sometimes a change is needed that gives dynamism, that stimulates the attention and motivation of students and that is in line with most current generations of children, generations that interact with technology since they were born.

The issue of researching reality as a whole has been a major target since the advent of humanity. This cognitive impulse, which is expressed within each individual, has the effect of the emergence of different theories, technologies and models of thinking in order to replace both physical and intellectual limits, limits with which each individual has been endowed. Therefore, theories have emerged about how the world perceives, knows and analyzes reality, theories of truth (Constantin, 2016).

Virtual reality (VR) is being used more and more often in daily activities. Nowadays, this type of technology is widely used, including in medicine, architecture and education.

Some time ago, Mychilo Stephenson Cline stated in one of his books that virtual reality technology has great chances to cause fundamental changes both in people's lives and in the activities they undertake every day (Cline, 2005). Even if Cline supported the potential of virtual reality, the National Academy of Engineering was the one that introduced this

technology in the category of engineering challenges specific to the current century, ie XXI (Ellis, 2009).

This technology, ie VR, has shown an accelerated evolution over the last four decades. The notion of virtual reality first appeared in Ivan Sutherland's doctoral thesis in 1963 (Sutherland, 1963).

However, the one who popularized the term virtual reality in its modern sense, in 1989, is Janon Lanier (Lewis, 1994). From that moment, the concept of VR began to be analyzed, expanded and used more and more by people interested in this field.

The notion of virtual reality has been defined by a multitude of researchers and from several perspectives. A first example may be the definition provided by Pimentel and Teixeira. They considered VR to be an experience that a computer produces. This experience is seen as interactive (Pimentel & Teixeira, 1993). In 1993, Brooks pointed out that participants in a virtual reality experience are immersed in the computer-generated world (Brooks, 1999). In a more recent year, ie in 2013, Dionisio considered VR as an interaction produced between participants and objects in the virtual world (Dionisio et al., 2013). Sherman and Craig also devised a definition similar to that of Pimentel and Teixeira. In 2018, the two researchers defined this technology by reference to the environment consisting of computer-generated simulations (Sherman & Craig, 2018).

The evolution of the presented definitions highlights the components of virtual reality: starting with the virtual world and immersion, continuing with the feedback and the degree of interactivity and ending with the participants.

Regarding the first key element of virtual reality, in 1995 Biocca and Levy stated that the virtual world suggests the space produced by a computer. Within this space, interactions are performed between participants (Biocca et al., 1995).

In psychological terms, immersion, another key element, highlights how involved the participants are in the action. Thus, immersion suggests whether or not a participant is attracted to the virtual world he or she enters.

The third key element of virtual reality is feedback. Feedback is the element that gives participants in a virtual reality experience the opportunity to see what the results of their actions are (Sherman & Craig, 2018).

In an experience involving virtual reality technology, interactivity is the fourth key element. This element has the ability to guide subjects so that they can interact and change the virtual world they have entered. Interactivity can only be achieved through sensors or devices that allow manipulation (Athens et al, 2015; Bowman & Hodges, 1999).

The most important key element of virtual reality is represented by the participants. A virtual reality experience cannot take place without at least one participant interacting with the virtual world he has entered. Also, one or more participants may be involved in such an experience, but the most important thing is that at least one subject must interact with the components of the virtual world, and the others must be observers. By complying with this requirement, it is possible to maintain interactivity. As well, children are unique users, they need special attention (Cramariuc & Pentiu, 2015).

Education can be seen as a process of discovery, exploration and observation, in addition to the eternal construction of knowledge. Through this, the specific characteristics of virtual reality can turn it into a powerful tool for the benefit of all those who seek an evolution of education. Thus, the use of VR in education has a multitude of benefits, making learning more memorable.

A first benefit may be that, through virtual reality, colleagues can collaborate and interact. It is also possible to achieve a virtual interaction between teachers and students. This type of reality also allows the connection between mentors and students, wherever they are.

Learning through virtual reality experiences offers the possibility of adaptability according to the characteristics and needs of students (students have various learning styles). Thus, students are allowed to learn at their own pace (Mantovani, 2003).

According to Clark (Clark, 2006), VR is a way in which learning can become more interesting, more attractive, improving both students' motivation and attention. At the same time, virtual reality integrated into education offers students and teachers the opportunity to participate in activities that would normally be impossible to participate in real life (for example, exploring a planet like Mars), very distant places or even places in past (historical places).

Virtual reality itself also offers great potential as an assessment tool, as each experience in this technology gives teachers the opportunity to monitor and record student progress, facilitating assessment.

Virtual reality will play a key role in education, as today's society and industry continue to get involved. The instructive-educational process will be modified when it will move from the current classes to the digital ones, changing the role of the teacher in that of facilitator. The future of virtual reality in the field of education depends on the availability of teachers to integrate technology in the instructional-educational process in order to improve the process.

With the correct introduction of virtual reality in education, this type of technology can be considered an effective tool to stimulate students' motivation, attention and interest, to collaborate with them and to improve the teaching-learning-assessment process as a whole.

1.2. The research gap

The choice of theme is motivated by the fact that the involvement of technology in education can offer, without a doubt, a multitude of opportunities to create an educational environment that is realistic, original and certainly fun. At the same time, there is research that demonstrates the benefits of integrating virtual reality in school lessons, which indicates that there are some concerns about the use of technology, virtual reality, in order to support the teaching-learning process.

For example, Youngblut was the one who conducted a survey on the implementation of virtual reality in education and its educational uses in the 1990s. His studies highlighted the role of teacher facilitator and the fact that students enjoy the use of virtual reality applications. Most of the teachers participating in Youngblut's studies stated that they would be willing to use virtual reality in education if it were more accessible (Youngblut, 1997).

Salzman, Dede, Loftin and Chen have developed a model that highlights how virtual reality activities help students in complex learning (Salzman et al., 1999).

Another researcher, Chee, exemplified in 2001 that in teaching physics students do not "make little sense", ie they find it difficult to understand notions and concepts. This author highlights the fact that VR can offer students and teachers the opportunity to learn higher education (San Chee, 2001).

Although there are these concerns, the lack of studies conducted on the Romanian population on the integration of virtual reality in the instructional-educational process in the classroom has influenced both the choice of the topic of the paper and the sample with which the research is conducted.

For this reason, this paper contributes to the identification of the opinions of teachers and parents regarding the integration of virtual reality in education, while also finding out how open the two categories of subjects are in using this type of technology in the teaching-learning process.

Thus, the objectives of the paper are:

- Determining the frequency with which primary school teachers use digital resources in the instructional-educational process depending on the environment in which they work.

- Identifying the relationship between the frequency of use of digital resources in the instructional-educational process and the availability of teachers to use virtual reality in education.
- Establishing the correlation between students 'access to digital devices and parents' availability to the use of virtual reality in education.
- Analysis of the opinions of teachers and parents on the integration of virtual reality in education.
- Finding the relationship between parents' trust in virtual teachers and their opinion on the integration of virtual reality in education.

2. Research questions/aims of the research

The questions that form the basis of this research are:

- Does the environment in which teachers work influence the frequency of use of digital resources in the instructional-educational process?
- What is the relationship between the frequency of use of digital resources in the instructional-educational process and the availability of teachers to use virtual reality in education?
- Is there a link between students 'access to digital devices and parents' availability to use virtual reality in education?
- What are the benefits of using virtual reality in the instructional-educational process?
- What is the opinion of teachers and parents on the integration of virtual reality in education?

The current era is dominated by a very strong expansion of both science and technology in all fields of activity. The need to study the impact of technology in the educational environment is being felt more and more strongly. Thus, the research hypotheses are represented by the following statements:

- I1: Teachers who teach in urban areas use digital resources more often in the instructional-educational process than those who teach in rural areas.
- I2: The frequency of use of digital resources in the instructional-educational process correlates positively with the availability of teachers to use virtual reality in education.
- I3: There is a positive correlation between students 'access to digital devices and parents' availability to use virtual reality in education.

- I4: There is a positive correlation between parents' availability to use virtual reality in education and opportunities to integrate this technology.
- I5: The availability of teachers to use virtual reality in education correlates positively with their opinion on its benefits.
- I6: Parents' trust in virtual teachers positively influences their opinion regarding the benefits of virtual reality integrated in education.

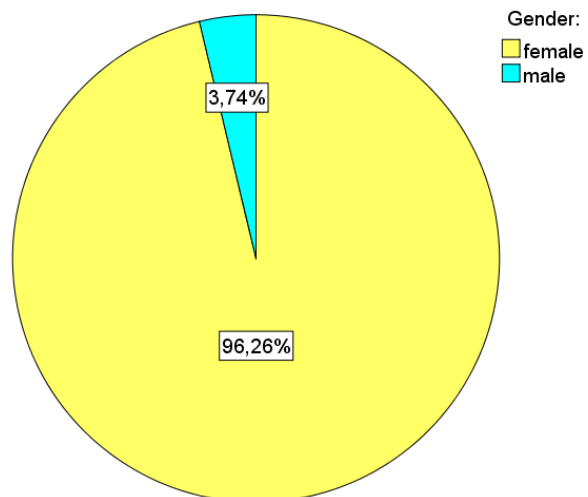
3. Research methods

3.1. Participants

In order to demonstrate the mobilizing character of the use of virtual reality in the school environment, more precisely in primary education, the research was conducted on two groups of subjects from across Romania. The first group is represented by teachers who teach in primary education and consists of 107 subjects, and the second group shows parents who have children enrolled in primary education and consists of the same number of subjects, ie 107.

About the group that includes primary school teachers who were involved in conducting the study it can be said that 96.26% are female and 3.74% are male, as shown in Chart 1.

Chart 1. Graphic representation of the group of teachers according to gender
(Source: Authors own contribution)



According to Chart 2, 63.55% are married and 36.45% are unmarried, and according to Chart 3, 31.78% are between 18 and 29 years

old, 26.17% between 30 and 39 years old, 28,04% between 40 and 49 years old, and 14.02% are 50 years old or older.

Chart 2. Graphic representation of the group of teachers according to civil status
(Source: Authors own contribution)

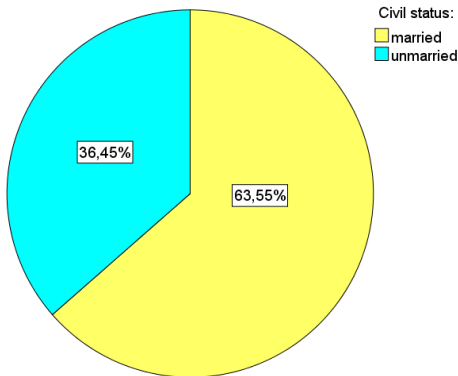
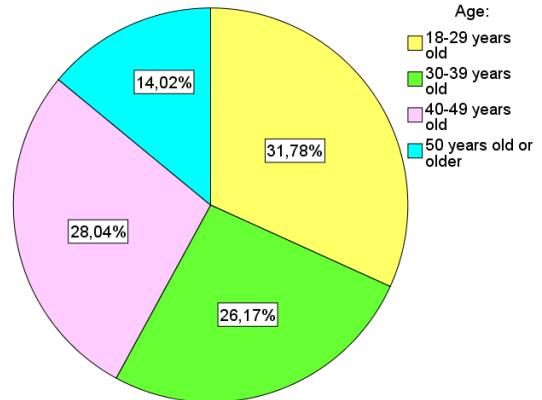


Chart 3. Graphic representation of the group of teachers according to age
(Source: Authors own contribution)



Depending on the area in which they teach, according to Graph 4, 18.69% operate in the urban area - large city (over 150,000 inhabitants), 31.78% in the urban area - small town, 44.86% in rural areas and 4.67% in isolated villages and schools. Chart 5 that highlight the didactic degree distribute the teachers as follows: 23.36% - beginner, 31.78% - finalized, 13.08% - second degree, 31.78% - first degree.

Chart 4. Graphic representation of the group of teachers according to teaching area
(Source: Authors own contribution)

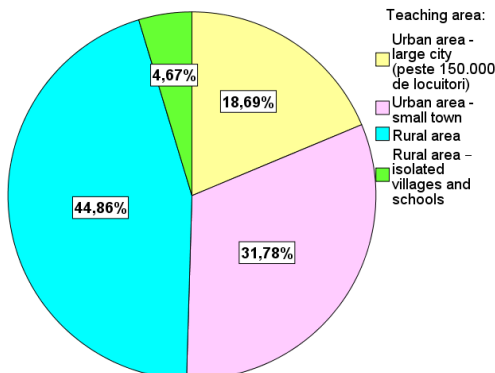
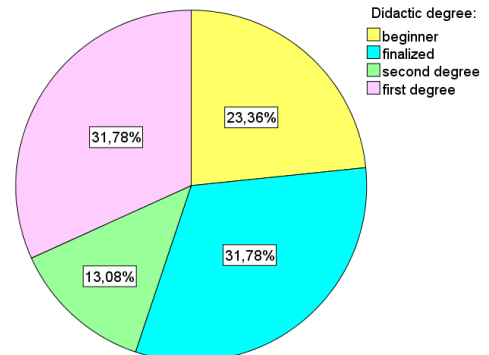


Chart 5. Graphic representation of the group of teachers according to didactic degree
(Source: Authors own contribution)



About the group that includes parents who participated in the study and who have children enrolled in primary education, it can be said that, according to Chart 6, 83.18% are female and 16.82% are male, and according to Chart 7, 90.65% are married and 9.35% are unmarried.

Chart 6. Graphic representation of the group of parents according to gender

(Source: Authors own contribution)

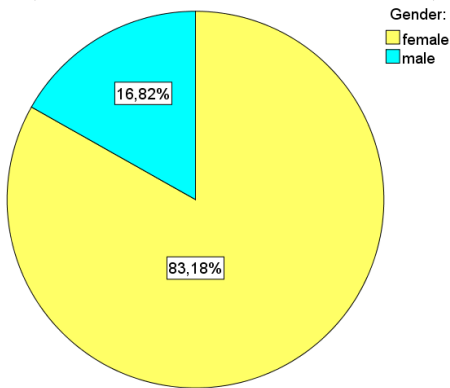
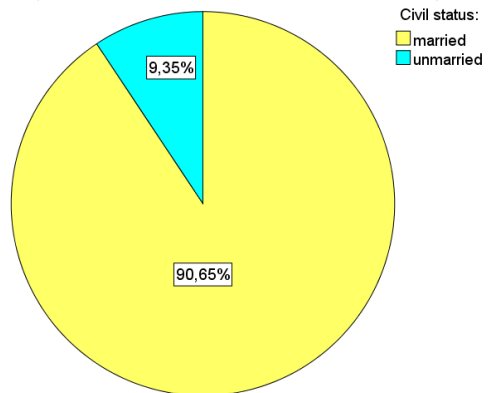


Chart 7. Graphic representation of the group of parents according to civil status

(Source: Authors own contribution)



According to Chart 8, 29.91% are between 18 and 29 years old, 46.73% between 30 and 39 years old, 19.63% between 40 and 49 years old, and 3.74% are 50 years old or older. Depending on the last graduated studies, the participating parents are divided as follows: 5.61% - primary education, 4.67% - middle school, 41.12% - high school, 28.97% - college - bachelor degree, 16.82% - college - master, 2.80% - doctorate (see Chart 9).

Chart 8. Graphic representation of the group of parents according to age

(Source: Authors own contribution)

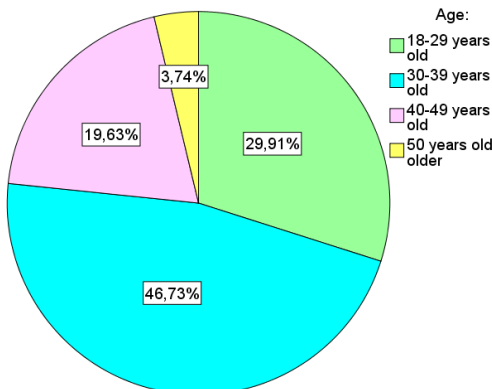
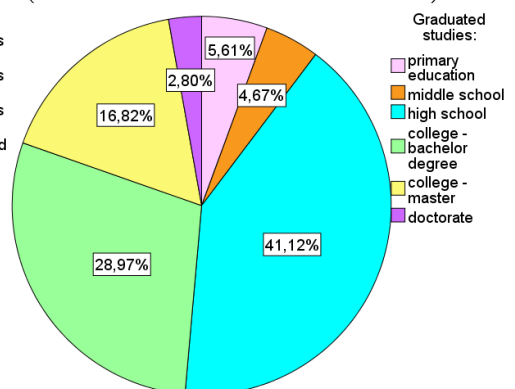


Chart 9. Graphic representation of the group of parents according to graduated studies

(Source: Authors own contribution)



3.2. Materials and instruments

The method of obtaining the data in the present research is the inquiry. This method is a complex one, which allowed the collection of scientific data on the opinions and attitudes of the subjects on the proposed topic. Thus, the questionnaire was used as a research tool for data acquisition. As the research has two samples of subjects, a questionnaire was developed for each sample. With the help of these questionnaires, data were analyzed in order to identify the attitude of teachers and parents regarding the use of technology and digital resources in education, more precisely virtual reality. The questionnaires were made in Google Forms, and then the links related to them were distributed online.

The questionnaire addressed to teachers teaching in primary education includes 20 questions, of which 3 allow multiple answers, 3 are designed in the form of a scale from 1 to 6 where 1 means "Never" and 6 represents "Very often", two include answers at 1 ("Strongly Disagree") at 5 ("Strongly Agree"), a question allow answers from 1 - "Not at all" to 5 - "Very much", and the rest suggest a single choice. To these questions are added another 9 that collect demographic data. Thus, some examples of questions/statements from the questionnaire are: "How often do you use the following sources of information in the teaching activity? (books, internet, television, newspapers, information from other colleagues)"; "How often do you use digital resources in the instructional-educational process?"; "During your lessons, what do you use digital technology for? Check the answers that apply."; "During the school program, what devices do your students have access to? Check the answers that apply. (mobile phone, computer / laptop, tablet, others)"; "What sources of information do students prefer? (books, internet) "; "I use virtual reality in the instructive-educational process."; "I would like to use virtual reality in the instructional-educational process."; "I believe that the use of virtual reality in education increases student involvement, the degree of interest."; "Virtual reality allows/could allow me to better adapt my lessons for each student individually."; "What do you think about the future of technology in education?".

The questionnaire for parents with children enrolled in primary education contains 21 questions, one of which allows multiple answers, two are designed in the form of a scale from 1 to 6 where 1 means "Never" and 6 represents "Very often", two contain answers from 1 ("Strongly Disagree") to 5 ("Strongly Agree"), two are formulated to allow answers from 1 - "Not at all" to 5 - "Very much", only one allows free answer, and the rest suggests

a single choice. To these questions are added another 5 that collect demographic data. Thus, some examples of questions/statements from the questionnaire are: "On a scale of 1 - Not at all to 5 - Very much, to what extent is your child interested in technology?"; "Does your child have digital communication and information processing devices?"; "What digital communication and information processing devices does your child use? Check the answers that apply. (computer/ laptop, tablet, smartphone, game console, virtual reality devices, others)"; "How often does your child use the following digital communication and information processing devices? (computer/ laptop, tablet, smartphone, game console, virtual reality devices, others)"; "Does your child use the internet?"; "Do you think that your child is able to search for information about various lessons/ school topics on the Internet?"; "Has your child ever used the telephone in teaching activities?"; "In your opinion, who is the teacher you would like for your child? (the teacher who carries out the instructive-educational process in the traditional way or the teacher who use technology)"; "I would like virtual reality to be introduced in the instructive-educational process."; "I use this technology with my child at home."; "I believe that the use of virtual reality in education could attract my child."; "My child's school results are / would be better."; "There is/ would be more collaboration between students."; "Would you trust your child to enroll in a class where a virtual teacher teaches?".

In order to facilitate the understanding of the questions by the subjects, I conceived them in a simple and clear manner, attaching at the same time a video suggestive of the notion of virtual reality and the possibility of introducing it in the instructive-educational activity in the classroom.

In order to centralize the data obtained through the questionnaire and to confirm or refute the proposed hypotheses, we used the SPSS program. In this program, we used Pearson-type correlations and T-tests for independent samples.

3.3. Procedure

Initially, the questionnaire was distributed online to several primary school teachers, as well as to parents who have children enrolled in this stage of education. Thus, all the teachers from the Romanian primary education who were willing and all the parents who have children enrolled at this level of education and who wanted to get involved in the study participated in the research. This method of distribution was chosen because the research was conducted during at the beginning of the pandemic period, when Romania

was in quarantine and this did not allow the rigorous selection of a sample and the physical meeting, face to face, with the respective subjects.

During the actual development of the study, the collection of data from the questionnaire was carried out during April 2020. The participants were involved in completing the questionnaires, being asked to treat them seriously. At the beginning of the two questionnaires, a brief description of their purpose was made. The participants were also informed that each person is unique, there are no right or wrong options, but only individual choices.

The participation of both teachers and parents, as well as the use of the results for research was approved by them. Participants were informed that their answers were confidential, being used only in the research. The duration of completing the questionnaire was about 10 minutes. The estimated time was sufficient. After receiving the participants' answers, the incomplete questionnaires were removed.

4. Results

4.1. Results

I1: Teachers who teach in urban areas use digital resources more often in the instructional-educational process than those who teach in rural areas.

In order to verify the existence of a difference between the average of frequency of use of digital resources by teachers teaching in urban areas and the average of frequency of use of digital resources by teachers teaching in rural areas I used the T test for independent samples.

According to the results, there is a significant difference between the average of frequency of use of digital resources by teachers who teach in urban areas (N = 52; M = 20,26; SD = 4,02) and the average of frequency of use of digital resources by teachers who teach in rural areas (N = 55; M = 12,41; SD = 6,39): [t(91,738)=7,639, p=0,000], as highlighted in Table 1.

Table 1. Statistics on the frequency of use of digital resources in the instructional-educational process according to the teaching environment (**Source:** Authors own contribution)

	Teaching environment	N	Mean	Std. Deviation	Std. Error Mean
Frequency of use of digital resources	Urban	52	20,2692	4,02987	,55884
	Rural	55	12,4182	6,39644	,86250

Thus, the results show that the environment in which the teachers carry out their activity influences the frequency of use of digital resources in the instructive-educational process (see Table 2). In other words, teachers who teach in urban areas use digital resources more often in the instructional-educational process than those who teach in rural areas. The hypothesis is confirmed.

Table 2. T test for independent samples: frequency of use of digital resources in the educational instructional process and teaching environment (**Source:** Authors own contribution)

		Independent Samples Test								
		Levene's Test for Equality of Variances			t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Frequency of use of digital resources	Equal variances assumed	33,366	,000	7,547	105	,000	7,85105	1,04035	5,78822	9,91388
	Equal variances not assumed			7,639	91,738	,000	7,85105	1,02772	5,80984	9,89226

I2: The frequency of use of digital resources in the instructional-educational process correlates positively with the availability of teachers to use virtual reality in education.

According to Table 3, there is a significant positive correlation between the proposed variables: [$r = 0,259$; $N = 107$; $p = 0,004$]. Thus, the more often teachers use digital resources in the instructional-educational process, the more their willingness to use virtual reality in education will increase. The effect is small in size, and Graph 1 highlights the Scatter representation of the result obtained. The hypothesis is confirmed.

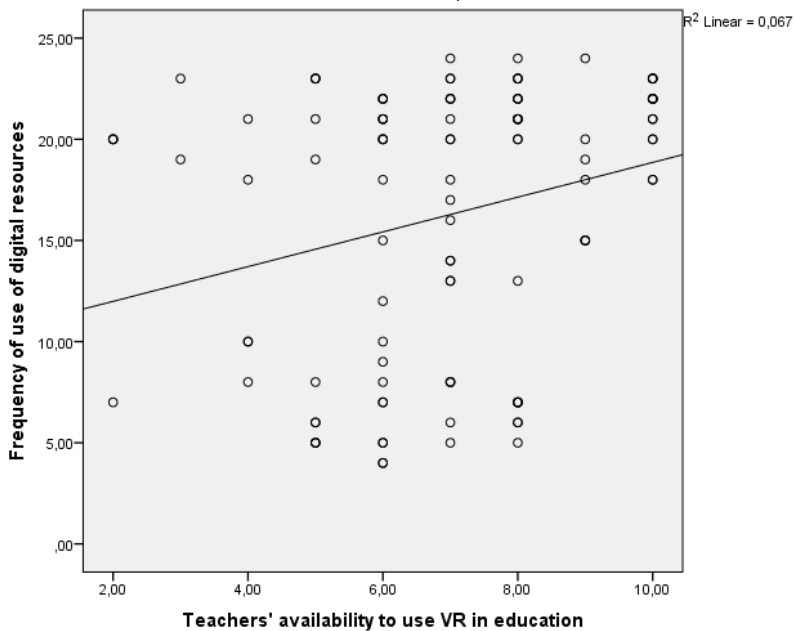
Table 3. Pearson correlation for the variables: the frequency of use of digital resources and the availability of teachers to use VR in education

Correlations			
Variables		Frequency of use of digital resources	Teachers' availability to use VR in education
Frequency of use of digital resources	Pearson Correlation	1	,259**
	Sig. (1-tailed)		,004
	N	107	107
Teachers' availability to use VR in education	Pearson Correlation	,259**	1
	Sig. (1-tailed)	,004	
	N	107	107

** . Correlation is significant at the 0.01 level (1-tailed).

(Source: Authors own contribution)

Graph 1. Scatter graph for the variables: the frequency of use of digital resources and the availability of teachers to use VR in education (Source: Authors own contribution)



I3: There is a positive correlation between students' access to digital devices and parents' availability to use virtual reality in education.

In order to analyze the relationship between students' access to digital devices and parents' availability to the use of virtual reality in education, I performed a Pearson correlation analysis in SPSS.

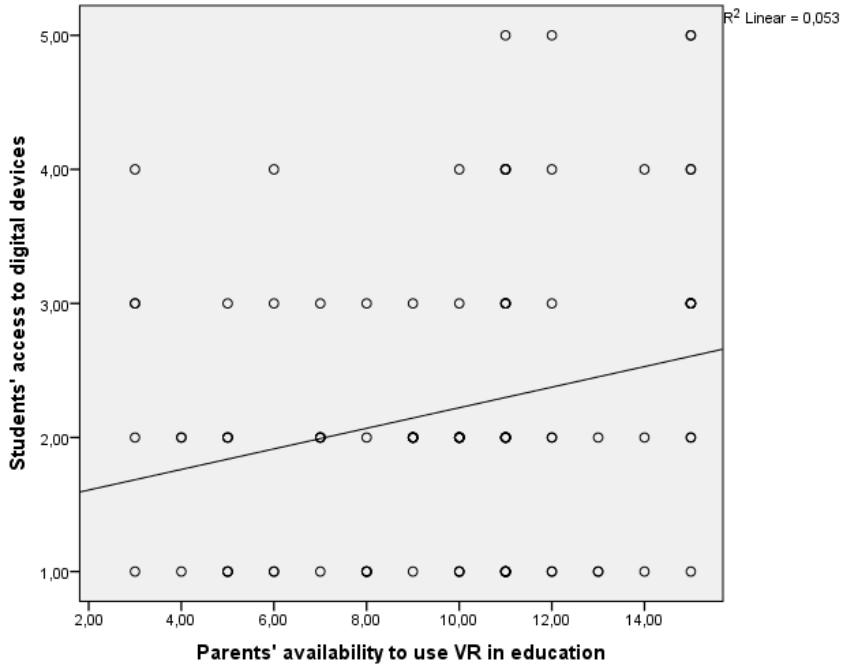
According to Table 4, there is a significant positive correlation between the proposed variables: [$r = 0,229$; $N = 107$; $p = 0,009$]. Thus, increasing the level of students' access to digital devices leads to increasing the availability of parents to use virtual reality in education. The effect is small in size, and Graph 2 highlights the Scatter representation of the result obtained. The hypothesis is confirmed.

Table 4. Pearson correlation for the variables: students' access to digital devices and parents' availability to the use of VR in education
 (Source: Authors own contribution)

Correlations			
Variables	Students' access to digital devices	Parents' availability to use VR in education	
Students' access to digital devices	Pearson Correlation	1	,229**
	Sig. (1-tailed)		,009
	N	107	107
Parents' availability to use VR in education	Pearson Correlation	,229**	1
	Sig. (1-tailed)	,009	
	N	107	107

** . Correlation is significant at the 0.01 level (1-tailed).

Graph 2. Scatter graph for the variables: students' access to digital devices and parents' availability to use VR in education (**Source:** Authors own contribution)



I4: There is a positive correlation between parents' availability to use virtual reality in education and opportunities to integrate this technology.

According to Table 5, it indicates the existence of a significant positive correlation between the proposed variables: [$r = 0,366$; $N = 107$; $p = 0,000$]. Thus, increasing the level of parental availability to the use of virtual reality in education leads to the development of opportunities to integrate this technology (possibility of continuous training and better technical means). The effect is of medium size, and the result is presented in the Scatter Graph 3. The hypothesis is confirmed.

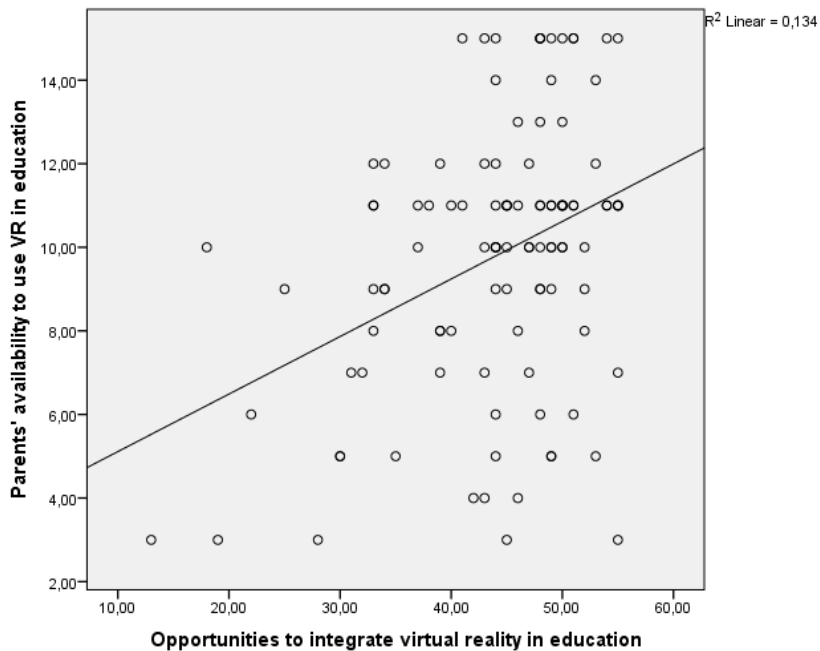
Table 5. Pearson correlation for the variables: parents' availability to use VR in education and opportunities to integrate virtual reality in education

Correlations			
Variables		Parents' availability to use VR in education	Opportunities to integrate virtual reality in education
Parents' availability to use VR in education	Pearson Correlation	1	,366**
	Sig. (1-tailed)		,000
	N	107	107
Opportunities to integrate virtual reality in education	Pearson Correlation	,366**	1
	Sig. (1-tailed)	,000	
	N	107	107

** . Correlation is significant at the 0.01 level (1-tailed).

(Source: Authors own contribution)

Graph 3. Scatter graph for the variables: the availability of parents to the use of VR in education and the opportunities for integration of this technology (Source: Authors own contribution)



H15: The availability of teachers to use virtual reality in education correlates positively with their opinion on its benefits.

According to Table 6, it is indicated that there is a significant positive correlation between the two variables: [$r = 0,543$; $N = 107$; $p = 0,000$]. Thus, increasing the availability of teachers to use virtual reality in education leads to a positive influence of opinion on the benefits of this technology. The effect is large in size, and the result obtained is presented in the Scatter Graph 4. The hypothesis is confirmed.

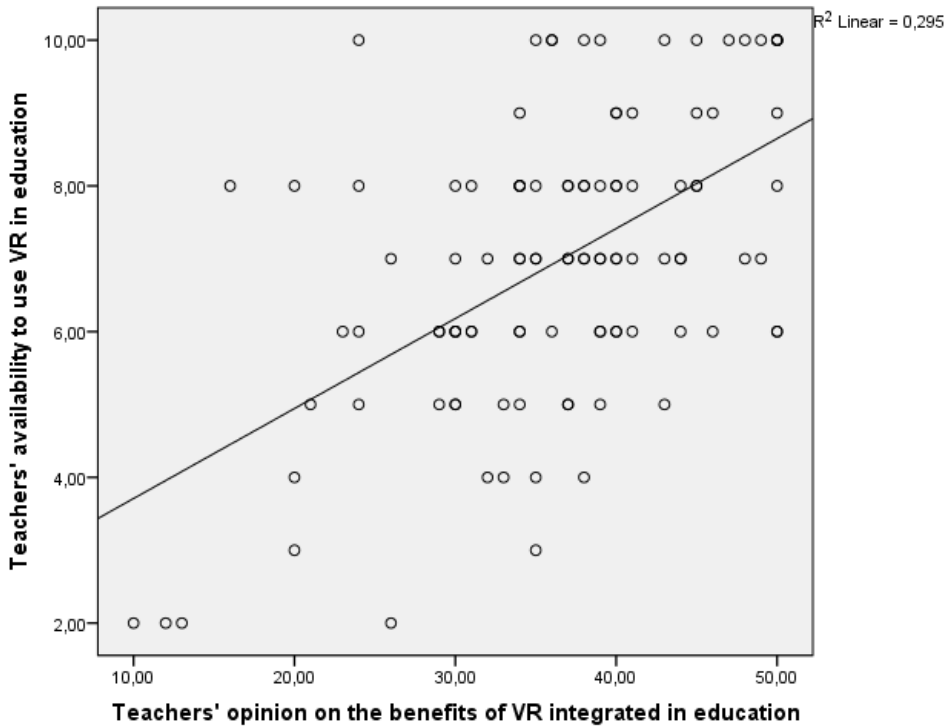
Table 6. Pearson correlation for the variables: the availability of teachers to use VR in education and their opinion on the benefits of integrating this technology

Correlations			
Variables		Teachers' availability to use VR in education	Teachers' opinion on the benefits of VR integrated in education
Teachers' availability to use VR in education	Pearson Correlation	1	,543**
	Sig. (1-tailed)		,000
	N	107	107
Teachers' opinion on the benefits of VR integrated in education	Pearson Correlation	,543**	1
	Sig. (1-tailed)	,000	
	N	107	107

** . Correlation is significant at the 0.01 level (1-tailed).

(Source: Authors own contribution)

Graph 4. Scatter graph for the variables: the availability of teachers to use VR in education and their opinion on the benefits of integrating this technology



(Source: Authors own contribution)

I6: Parents' trust in virtual teachers positively influences their opinion regarding the benefits of virtual reality integrated in education.

According to the results, there is a significant difference between the average of opinions regarding the benefits of integrated virtual reality in education of parents who would trust virtual teachers (N = 58; M = 42,20; SD = 8,86) and the average of opinions regarding the benefits of virtual reality integrated in education of parents who would not trust virtual teachers (N = 48; M = 26,72; SD = 10,93): [t (90,100) = 7,892, p = 0,000], as highlights in Table 7.

Table 7. Statistics on the frequency of use of digital resources in the instructional-educational process according to the teaching environment

	Parents' trust in virtual teachers	N	Mean	Std. Deviation	Std. Error Mean
Parents' opinion on the benefits of VR integrated in education	Yes	58	42,2069	8,86895	1,16455
	No	48	26,7292	10,93256	1,57798

(Source: Authors own contribution)

In other words, parents who trust to enroll their children in a class where a virtual teacher teaches have a positive opinion about the benefits of virtual reality integrated in education compared to parents who do not trust to enroll their children in such a of class (see Table 8).

Table 8. T-test for independent samples: parents' opinion on the benefits of VR integrated in education and their trust in virtual teachers

		Independent Samples Test								
		Levene's Test for Equality of Variance			t-test for Equality of Means					
	s	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Parents' opinion on the benefits of VR integrated in education	Equal variances assumed	7,129	,009	8,049	104	,000	15,47773	1,92302	11,66431	19,29115
	Equal variances not assumed			7,892	90,100	,000	15,17773	1,96117	11,58158	19,37388

(Source: Authors own contribution)

5. Discussions

According to Clark, virtual reality offers the possibility of attractive learning, improving students' attention, interest and motivation (Clark, 2006). For this reason, the research demonstrates both the influence of the environment in which teachers work on the frequency of use of digital resources, and the relationship between this frequency and the availability of teachers to use virtual reality in education. At the same time, it is highlighted that parents who offer their children access to digital devices have a greater availability than the integration of virtual reality in education. Thus, the more exposed they are to this technology, the more parents will be open to the development of integration opportunities. Finally, it is observed that the opinion of teachers regarding the benefits of integrating virtual reality is influenced by their availability, and the opinion of parents by that of trust in virtual teachers.

The obtained results complete the image of virtual reality integrated in education. The research helps to identify the opinions of both categories of people regarding the use of virtual reality in the field of education, given that the data were collected from both teachers and parents.

At the same time, in this case, the number of subjects can be considered a strong point of the quantitative study presented because it is performed on a sample with a large number of participants, that of 214, of which 107 are teachers and another 107 are parents.

A limitation of the study can be represented by the idea that the research is performed on a group of subjects that was not selected with great rigor. The participants were chosen according to a single criterion: to teach in primary education or to have a child enrolled at this level. Thus, all subjects who expressed this desire participated.

In addition, the two questionnaires were distributed online. For this reason, it was not possible to observe the behaviors of the subjects during the completion of the questionnaire, their attitude and interest in it. Instead, each answer received gives the impression that it has been completed with seriousness and attention.

However, this research highlights aspects regarding the frequency of use of digital resources, the integration of virtual reality in education, more precisely in the instructive-educational process, the availability of teachers who teach in primary education and parents who have children enrolled in this level of education, as well as opportunities to integrate this technology.

Because the teaching methods used by teachers working in education are diverse, from traditional to modern, we want through research to provide an impetus for the use of a new method, that of virtual reality.

Research by authors such as Youngblut (1977), Salzman, Dede, Loftin, Chen (1999) and Chee (2001) shows the benefits of integrating virtual reality in education, usually in higher education. They highlight the fact that virtual reality helps students to collaborate and interact, gives teachers the opportunity to adapt lesson content to students' learning styles, allows them to be attracted and motivated, provides an opportunity to monitor their progress and at the same time represents the way to explore the past and the future, cosmic spaces, historical places and natural landscapes. Many others articles about virtual reality in education have appeared in various countries around the world, but very few are focused on its integration into primary education.

This type of reality has been, is and will be researched in the countries of the world, but Romania does not provide specific data for the proposed topic. As the Romanian space does not have a basis regarding the virtual reality used in education, the presented article can be a launching pad for future articles or studies on the integration of virtual reality in the instructional-educational process in the classroom.

As the article was written when, to our knowledge, there were no data on the attitude of parents and teachers regarding the integration of virtual reality in education, we consider that it captures very well the moment of change of attitude of teachers and of parents. They want to be bolder, more open to new learning opportunities, supporting children and implementing methods to attract and motivate them because current and future generations are born and raised with various digital devices.

Since the teachers and parents participating in the research showed their willingness to use virtual reality in the classroom, we can conclude that the article urges education participants to try a change in the instructional-educational process and this change is the integration of virtual reality.

The article suggests that teachers and parents are not two categories of people who are against the new, but are open to new teaching-learning methods. If we found out from the study that parents and teachers have a positive opinion about virtual reality in education and are open to its use, why not take advantage of this and not offer the instructional-educational process a novelty?

6. Conclusions

Advances in technology provide education with a multitude of effective and innovative learning tools. Among these tools, we can say that VR seems to have a wide range of advantages in the field of education. Virtual reality perspectives are very attractive and can change both the way people think and the understanding of time and space. Virtual reality offers the possibility to develop a new way of teaching and learning. This technology has its own advantages and can gradually stimulate the attention and interest of teachers, parents and students, and will eventually be widely used and play an important role in education.

Although the advantages and benefits of virtual reality in education are not well known, research participants had the opportunity to see an example of activity carried out by integrating this technology, while being given the opportunity to express views on this model of activity. Many subjects have not had the opportunity to experience an interaction with virtual reality so far, but, nevertheless, they proved to be open, expressing their attitude towards the integration of this type of technology in education.

In conclusion, this study revealed important aspects of the integration of virtual reality in education. The results are encouraging and urge us to give more importance to trying to integrate this technology in the instructional-educational process. There are teachers and parents who encourage the use of virtual reality in school lessons and, for this reason, argue that the research presented requires both extension to other educational cycles and trying to carry out activities through this technology. Therefore, it is necessary to develop the topic by conducting an experimental research at the level of primary school students, using virtual reality applications in order to identify their benefits in education.

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