Instructive Assessment Of Students Using Virtual Reality (Vr) Technologies

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Abstract-The digital world in which today's children are nurtured is where they develop their social and professional networks. The classroom might act as a submarine, carrying students safely through the immense ocean of digital information already available. How prepared are educators and parents to mentor today's youth? The goal of this study is to determine how familiar and receptive primary school teachers and parents of pupils at this level are to virtual reality (VR) in the classroom. The findings of this study support instructors' and parents' upbeat assessments of virtual reality's potential in the classroom and their willingness to use the technology.

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

Introduction

Transformations brought forth by technology and the proliferation of computers are ubiquitous in the 21st century. One could say that the era of Socratic instruction is rapidly coming to an end. The internet has made it possible for anyone, at any time, to become an expert in any field they choose. Teachers and students are encouraged by the availability of digital tools like the Internet to focus on topics and information that particularly interest them. Many students today know more about a certain topic than their teachers do, thanks to the ease with which they can now access a wealth of material with just a few clicks of the mouse, eliminating the need for

time-consuming and laborious journeys to the library. In our century, technological possibilities are infinite. Thus, today's pupils can be described as "digital learners."[1-2]

Knowledge is traditionally passed on from teacher to student, with the instructor having complete control over the learning process. In addition, the worksheets and other training materials typically employed are not dynamic. It's true that this method of teaching is effective in the vast majority of cases, but sometimes it's necessary to switch things up in order to keep up with the everchanging interests of today's students and to appeal to the generations of kids who have grown up with technology at their fingertips [3-6].

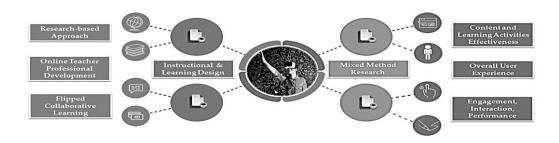


Figure 1: Virtual and Augmented reality

Since the dawn of humanity, investigating the entirety of reality has been an important goal. Each person's unique cognitive drive has led to the development of novel explanations for the world and the invention of cutting-edge tools and ways of thinking that aim to overcome the inherent limitations of the human brain. So, various theories of truth have developed to explain how people around the globe take in, process, and make sense of the world around them.

The use of virtual reality (VR) technology continues to expand into mainstream culture. This type of technology is now commonly employed in many fields, such as healthcare, construction, and instruction. Mychilo Stephenson Cline wrote in one of his books not too long ago that he believes virtual reality technology has the potential to significantly alter people's daily routines and way of life. Although Cline was optimistic about VR's possibilities, it was the National Academy of technical that included it in its list of technical challenges unique to this century. development of virtual reality technology has sped up in the recent four decades. The term "virtual reality" was originally used in Ivan Sutherland's 1963 PhD thesis. Janon Lanier, however, is credited with popularizing the word "virtual reality" in its current usage back in 1989. People interested in this sector immediately began to examine, develop, and use the idea of VR [7-10].

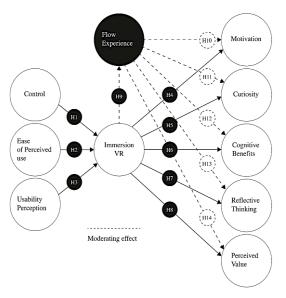


Figure 2: The impact of immersion through Virtual reality in the learning experience

Numerous scholars have characterized "virtual reality" (VR) from various vantage points. Pimentel and Teixeira's possible definition is the first such instance. They thought of virtual reality as something a computer generates. The audience participates in this event. In 1993, Brooks made the observation that VR makes its users feel like they're really there. In 2013, Dionisio defined virtual reality (VR) as the result of interactions between users and virtual environments. Similar to Pimentel and Teixeira's, Sherman and Craig also came up with their own definition. In 2018, the two scientists gave a definition of this technology based on a simulated digital world. Starting with the virtual environment and immersion, moving on to feedback and the level of interactivity, and finally wrapping up with the participants, the progression of the offered definitions emphasizes the components of virtual reality. In 1995, Biocca and Levy made a crucial observation about virtual reality: the term "virtual world" implies the space generated by a computer. Here, participants are able to engage in meaningful connections with one another [11].

Another crucial aspect, immersion, emphasizes the emotional investment of the audience in the action. Therefore, immersion indicates how interested a player is in the virtual environment they enter. In virtual reality, feedback is the third essential component. The ability to perceive the outcomes of one's activities in a virtual reality setting is provided by feedback. The fourth essential component of a virtual reality experience is the ability to interact with the environment. This component can direct people to interact with and alter the virtual world they have entered. Only sensors or manipulatable devices can achieve interactivity. Participants are the most crucial part of a virtual reality experience. One participant's interaction with the virtual environment he has entered is required for a virtual reality experience to occur. As for the number of people involved, there can be as many as you like, but the most crucial part is that at least one subject engages with the virtual world's elements while the others are only viewers. If you follow this rule, you can keep the conversation flowing. Additionally, kids are different from other users and require individual care. In addition to the everlasting

building of knowledge, education can be thought of as a process of discovery, exploration, and observation. All those interested in advancing their knowledge can profit from the unique qualities of virtual reality in this way. As a result, virtual reality (VR) can be used to enhance the educational experience and aid in the retention of information. One potential advantage is that colleagues can work together and socialize in a virtual environment. In addition, online communication between educators and their pupils is feasible. Mentors and their pupils, no matter where they may be, can connect in this form of reality as well. Because students have varying learning methods, virtual reality learning environments can be tailored to meet their individual requirements. This means that students have the freedom to study at their own speed. Clark claims that virtual reality (VR) can boost students' motivation and attentiveness by making classroom activities more engaging. Similarly, the incorporation of VR into the classroom allows both students and instructors to experience activities that would be physically impossible in the classroom (such as exploring a distant planet like Mars). The use of VR as an assessment tool has enormous promise, as teachers may track their students' development with ease during their time in the medium.

As modern culture and business invest more in the technology, virtual reality will become an integral part of classroom instruction. If and when we make the transition from traditional classrooms to online ones, our job as educators will shift from instructor to facilitator. The success of VR in the classroom will depend on how willing educators are to adopt new technologies and incorporate them into the classroom setting. Virtual reality, when implemented properly in the classroom, has the potential to increase students' motivation, attention, and interest; foster greater student-teacher collaboration; and enhance the quality of the teaching, learning, and evaluation process as a whole [12-15].

The lack of studies

This topic was selected because of the many possibilities for creating a realistic, creative, and enjoyable learning environment that the widespread use of technology in education presents. However, there is evidence that shows

how incorporating VR into classrooms can help students learn, and this suggests that some worry about how virtual reality can be used as a teaching tool. As an illustration, Youngblut was the one who in the 1990s surveyed the educational usage of virtual reality. His research showed how important a teacher's facilitation role is, and how much fun VR apps are for kids. Most educators who took part in Youngblut's surveys said they would be open to using VR in the classroom if technology were more easily accessible.

A model devised by Salzman, Dede, Loftin, and Chen shows how engaging in VR activities can aid in the comprehension of complex material. Chee, another scholar, provided an example in 2001 of how students in physics classes "make little sense," or struggle to grasp abstract ideas and concepts. This author argues that virtual reality has the potential to help educate both students and educators at the university level. Despite these reservations, the paucity of research on the Romanian population's adoption of VR in the classroom informed both the topic selection for this paper and the selection of participants for this study's research sample. 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 aims of the article are to:

- Find out how often instructors in primary schools use digital materials in the classroom and how that varies with the setting in which they teach.
- Determining whether or not teachers have access to virtual reality technology and how often they use digital resources in the classroom.
- Investigating whether or not there is a connection between students' use of personal digital devices and their parents' openness to educational VR.
- A survey of educators' and parents' perspectives on VR's potential in the classroom.
- Determining whether or not parents have faith in virtual educators and what they think about using VR in the classroom.

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- The study's core research questions and objectives
- These studies are driven by the following research questions:
- Is there a correlation between teachers' access to technology and their use of it in the classroom?
- Is there a correlation between teachers' access to virtual reality technology and the amount of digital resources used in the classroom?
- Is there a correlation between the willingness of parents to support the use of virtual reality in the classroom and their children's access to digital devices?
- Asking, "How can we reap the benefits of virtual reality in the classroom?"
- What do educators and parents think about using VR in the classroom?
- In today's times, science and technology have exploded in all spheres of endeavor. Research into technology's effect on classrooms is becoming increasingly important. Therefore, the following claims serve as research hypotheses:
- I1: Educators in urban settings are more likely to make use of online materials than their rural counterparts in lesson planning and delivery.
- Hypothesis 2: Teachers' openness to incorporating VR into the classroom expands in tandem with their comfort using digital tools in the classroom.
- Students' access to digital devices is correlated with their parents' openness to using VR in the classroom (I3).
- Availability of virtual reality in the classroom is positively correlated with parental support, as shown by Hypothesis 4.
- Teachers' positive attitudes of virtual reality's potential in the classroom are correlated with their willingness to use the technology.
- When parents have faith in their children's virtual teachers, they are more likely to see the value in using VR in the classroom [16-19].

Research methods

Participants

Two groups of students from different parts of

Romania participated in the study to highlight the mobilizing nature of using VR in the classroom, namely in primary education. The first set, made up of teachers in elementary schools, consists of 107 subjects, while the second set, made up of parents with children in elementary school, also has 107 subjects. Based on the distribution of gender in Chart 1, we may infer that 96.26 percent of the primary school teachers who participated in the study are female and 3.74 percent are male.

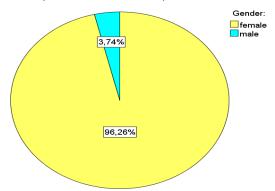
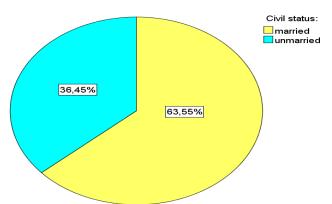


Chart 1. Graphic representation of the group of teachers according to gender According to Chart 2, 63.55% are married and 36.45% are unmarried, and according to Chart 3, 31.78% are between 18 and 29 years old, 26.17% between 30 and 39 years



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

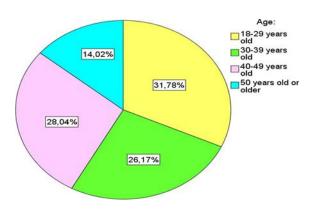


Chart 3. Graphic representation of the group of teachers according to age

Graph 4 shows that 18.69% of schools are located in a large city (more than 150,000 residents), 31.78% are in a small town, 44.86% are in rural areas, and 4.67% are in remote villages and schools. The following is a translation of the chart 5 highlighting the didactic degree distribution of the teachers: There were 13.08% at the second-degree level, 31.78% at the first-degree level, and 23.36% at the beginning level.

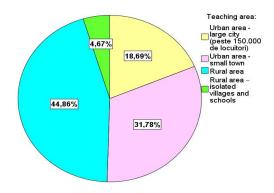


Chart 4. Graphic representation of the group of teachers according to teaching area

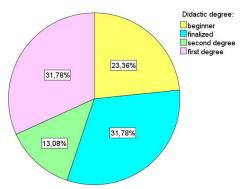
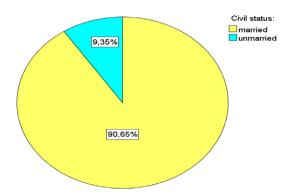


Chart 5. Graphic representation of the group of teachers according to didactic degree

According to Chart 6, 83.18 percent of the parents who participated in the study are female, while 16.82 percent are male. Chart 7 shows that 90.65 percent of the parents who participated in the study are married, while 9.35 percent are not



married.

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

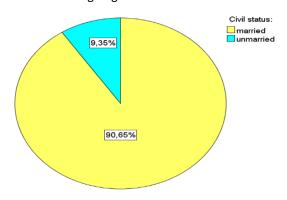


Chart 7. Graphic representation of the group of parents according to civil status

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).

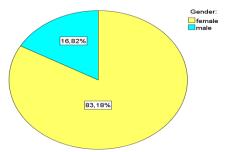


Chart 8. Graphic representation of the group of parents according to age (Source: Authors own contribution)

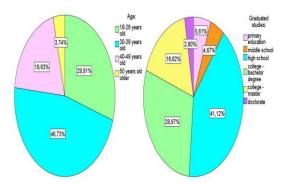


Chart 9. Graphic representation of the group of parents according to graduated studies

Materials and instruments

Inquiry is used as the data collection technique in this study. This intricate strategy gathered empirical information about the respondents' perspectives on the matter under investigation. For this reason, the questionnaire served as a useful instrument for collecting information. Due to the study's split-subject design, two separate surveys were required. Teachers' and parents' perspectives on the integration of VR and other digital resources into the classroom were gleaned from the responses to these surveys. Google Forms were used to create the questionnaires, and their associated links were shared widely on the web. Twenty questions are included in the survey of primary school educators; three of them have multiple-choice responses; three are laid out on a scale from 1 to 6 where 1 means "Never" and 6 represents "Very often"; two include responses at 1 ("Strongly Disagree") and 5 ("Strongly Agree"); one allows answers from 1 - "Not at all" to 5 -"Very much"; and the rest suggest a single choice. Nine more demographic questions have been added to the list. Thus, some examples of questions/statements from the questionnaire are as follows: "How often do you use digital resources in the instructional-educational process?" "During your lessons, what do you use digital technology for?" and "How do you feel about the use of technology in the classroom?" Select all that apply; "What kinds of technology do your students have access to during the school day?" Select all that apply. (cellular phone, laptop/notebook computer,

tablet computer, etc.)"; "Which information tools do students prefer? (books, the web) "; "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 on an individual basis."Asking, "What do you think about the future of technology in education?"

One question in the survey for parents of elementary school students allows for more than one response, two questions use a scale from 1 to 6 where 1 means "Never" and 6 means "Very often," two questions offer responses ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree"), two questions provide responses ranging from 1 - "Not at all" to 5 - "Very much," one question allows for a free response, and the rest suggest a single choice. Five more demographic questions have been added to this set. To that end, the questionnaire asks, "On a scale of 1 (not at all) to 5 (very much), to what extent is your child interested in technology?" and "Does your child have digital communication and information processing devices?"To what extent does your child make use of electronic means communication and data processing? Select all that apply. 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 the for information about Internet lessons/school topics?"; "Has your child ever used the telephone?""Which educator do you envision your child having?" (the teacher who carries out instructive-educational process in traditional way or the teacher who uses 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 like to see virtual reality

I framed the questions in a way that was easy to grasp by the subjects, and I included a movie that hinted at the idea of virtual reality and the possibilities of incorporating it into the classroom's instructive-educational activity. We utilized the SPSS tool to aggregate the survey responses and test whether or not our hypothesis held water. Pearson correlations and T-tests for sizing independent samples were employed in this software.

Procedure

The survey was piloted by sending out emails to a sample of primary school educators and parents whose children were enrolled in that level of schooling. As a result, all interested Romanian primary school teachers and parents of students at that level of education took part in the study. As the study was conducted during the start of the pandemic period, when Romania was quarantined, a random sample and in-person meetings with the various subjects were not possible, hence this distribution approach was opted for instead.

Data collecting from the questionnaire occurred in April 2020, during the course of the study's development. The participants were tasked with filling out the surveys and were urged to give them their full attention. Both questionnaires provided a brief explanation of their goals at the outset. They were also told that everyone is different and that there are no absolute right or wrong answers, just personal preferences. Teachers and parents gave their consent for their children to take part in the study and for the data to be used in scientific studies. It was made clear to participants that their responses would be kept strictly confidential and utilized for scientific purposes only. The time needed to finish the survey was roughly 10 minutes. The predicted duration worked out fine. Unfinished surveys were discarded after collecting responses from participants.

Results

Independent Samples Test

I1: Educators in urban settings are more likely to make use of online materials than their rural counterparts in lesson planning and delivery.

To determine if there is a significant gap between urban and rural educators' use of digital resources in the classroom, we compared the average frequency of use by urban educators to that of rural educators. The T test was what I used to compare two separate groups.

Table 1 shows that there is a statistically significant difference between the average number of times urban teachers use digital resources (N = 52; M = 20,26; SD = 4,02) and the average number of times rural teachers use digital resources (N = 55; M = 12,41; SD = 6,39): [t(91,738)=7,639, p=0,000].

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	N	Mean	Std.	Std.	
	environm			Deviati	Error	
	ent			on	Mea	
					n	
Freque	Urban	5	20,26	4,0298	,558	
ncy of		2	92	7	84	
use of	Rural	5	12,41	6,3964	,862	
digital		5	82	4	50	
resourc						
es						

Thus, the findings indicate that teachers' use of technology in the classroom is affected by the context in which they work (see Table 2). This means that urban educators make greater use of digital tools in the classroom than their rural counterparts. The theory checks out.

Frequency of usage of digital resources in the classroom, as measured by a T test for independent samples (Table 2).

Levene'	t-test for Equality of
s Test	Means
for	
Equality	
of	

Varianc es

F Sig t df Sig. Mea Std. 95%

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Equal varianc es assume d 33,3,007,5 7,8511,0405,7889,913 Freque 0 000, 105 ,0000 3 2 6 7 2 8 nc y of 5 use of Equal variances not assume 7,6 91,7 7,8511,0275,8099,892 resourc 3 3 ,0000 7 8 2

I2: Teachers' willingness to incorporate VR into the classroom increases in tandem with their comfort using digital resources in the classroom.

e s

The proposed factors are positively correlated, as seen in Table 3. [r = 0.259; N = 107; p = 0.004]. Therefore, educators' openness to incorporating VR into the classroom grows in proportion to the

frequency with which they employ digital tools in the classroom. Graph 1 features the Scatter representation of the acquired data, which shows that the influence is quite modest in size. The theory checks out.

5

2

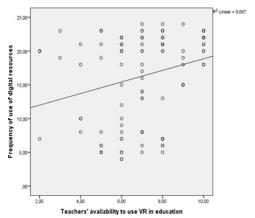
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9 8

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	S						
	Frequency of use of digital		Teachers'	availability to			
Variables	resources	use VR in e	e VR in education				
	Pearson		1	,259**			
	Correlation						
Frequency	ofSig. (1-tailed)			,004			
use of digi	ital						
resources							
	N	107		107			
	Pearson	,259**		1			
Teachers'	Correlation						
availability	toSig. (1-tailed)	,004					
use VR	in						
education							
	N	107		107			

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



Graph 1. Scatter graph for the variables: the frequency of use of digital resources and the availability of teachers to use VR in education.

13. Students whose families are more open to using VR in the classroom are more likely to have

access to digital gadgets.

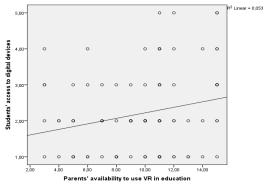
I used a Pearson correlation analysis in SPSS to examine the link between students' access to digital devices and parents' openness to the usage of virtual reality in education.

The proposed factors are positively correlated, as seen in Table 4. $[r=0,229;\ N=107;\ p=0,009].$ Consequently, if more students have access to digital devices, more parents will be willing to adopt virtual reality in the classroom. The effect is negligible, and the Scatter representation of the data obtained is featured prominently in Graph 2. The theory checks out.

Table 4. Pearson correlation for the variables: students 'access to digital devices and parents' availability to the use of VR in education

Correlations

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



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.

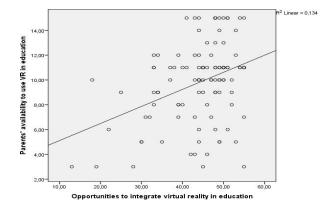
According to Table 5, it indicates the existence of a significant positive correlation between the proposed variables: [r = 0,366; N = 107; p

= 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' vailability to use VR in education		integr	unities to ate virtual n education		
Parents' availabil	lity to	use VR	Pearson in Correlation		1	,366**	
education		Sig. (1-tailed)		,000			
			N	107		107	
Opportunities to	o integ	rate	Pearson Correlation	,366**		1	
	rtual	reality	inSig. (1-tailed)	,000			
education							
-			N	107		107	

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



Graph 3. Scatter graph for the variables: the availability of parents to the use of VR in education

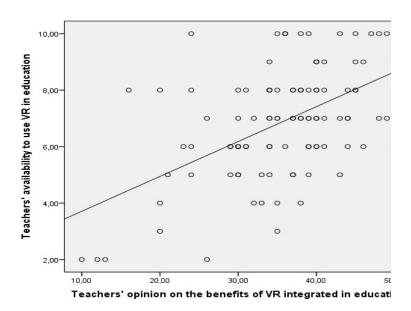
and the opportunities for integration of this technology.

Teachers' positive attitudes of virtual reality's potential in the classroom are correlated with their openness to implementing the technology. Table 6 shows a positive correlation between the two variables that is statistically significant (r = 0.543; N = 107; p .000). As a result, public perception of VR's advantages improves as its use in the classroom becomes more widespread. The effect is sizable, and the data acquired is shown in Scatter Graph 4. The theory checks out.

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			
		Teachers' availability	Teachers' opinion on the
Variables		to use VR in education	benefits of VR integrated
			in education
	Pearson	1	,543**
Teachers' availability	toCorrelatio	on	
use	Sig. (1-tai	led)	,000
VR in education			
	N	107	107
Teachers' opinion on	thePearson	,543**	1
benefits of VR integra	tedCorrelatio	on	
in education	Sig. (1-tai	led),000	
	N	107	107

^{**.} Correlation is significant at the 0.01 level (1 tailed).



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

I6: When parents have faith in their children's virtual teachers, they are more likely to see the value in using VR in the classroom.

The results are highlighted in Table 7, which shows a statistically significant difference between the average opinions of parents who would trust virtual teachers (N = 58; M = 42,20; SD = 8,86) and

the average opinions of parents who would not trust virtual teachers (N = 48; M = 26,72; SD = 10,93) regarding the benefits of virtual reality integrated in education.

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

Parents' trust in vi	rtual	Ν	Mean	Std.	Std. Error
Teachers				Deviation	Mean
Parents' opinion	onYes	58	42,2069	8,86895	1,16455
the benefits of VR					
integrated	in				
education					

No

48 26,7292 10,93256 1,57798

In other words, parents who are more likely to enroll their children in a class taught by a virtual teacher have a more favorable view of the benefits of virtual reality integration in education than those who are less likely to do so (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

their trust in virtual teachers						
Independent Samples Test						
	Levene	t-test for Equality of				

's Test Means for Equalit y of Varian ce s

F Sigt df Sig. Mea Std. 5%
. (2- n Error Confidence aile Diffe- Diffe- Interval of d) rencerencethe

Differe nce Lowe Uppe

Parent Equal varianc es assume

s'	d	7,1	,0	8,0			15,4	71,92 3	311,66	19,29
opinio		2	0	4 1	.04	,00	7	0	4	1
n on		9	9	9		0	73	2	31	15
the Equ	ual varianc es not									
benefit ass	ume d			7,8 9	0,1		15,1	71,961	111,58	19,37

benefitassume d 7,8 90,1 s of VR 9 0

9 0 ,00 7 1 1 3 2 0 0 73 7 58 88

integra t ed in educat

io n

Discussion

According to Clark, students' focus, curiosity, and

drive could all benefit from the immersive environment provided by VR (Clark, 2006). Therefore, the study shows that teachers' working

environments have an effect on how often they use digital resources, and that there is a correlation between this frequency instructors' access to VR technology for classroom use. Concurrently, it is emphasized that the availability of parents who provide their children with access to digital devices is higher than the incorporation of virtual reality in school. Therefore, the greater parents' familiarity with this technology, the more receptive they will be to the creation of integration possibilities. Finally, it is noted that the availability of teachers affects their view of the advantages of incorporating virtual reality, while parents' views are affected by their trust in virtual teachers.

The findings round out a picture of how virtual reality can be used in the classroom. Since data were obtained from both educators and parents, this study illuminates the perspectives of both groups on VR's potential role in the classroom. While this is a weakness in some quantitative studies, the high sample size (214 students, 107 educators, and 107 parents) used in this one is a strength. This study has the potential drawback that it is conducted on a sample population that was not carefully chosen. All of the people who took part in the study either worked in or had a child in elementary school. Therefore, every willing subject was included. Both surveys were made available via the Internet. Therefore, it was not feasible to witness the subjects' behaviors, attitudes, or levels of interest as they filled out the questionnaire. Instead, it appears that careful thought and consideration went into each response.

However, this study draws attention to factors like the availability of teachers who teach at the primary education level and parents whose children are enrolled at this level, as well as opportunities to integrate this technology, such as the frequency with which digital resources are used and the integration of virtual reality in education, specifically in the instructive-educational process. Since there is a wide range of approaches utilized by educators, from the tried and true to the cutting edge, we hope that our study may spark interest in incorporating virtual reality into classrooms. Virtual reality has been shown to be beneficial in education, particularly in

higher education, by researchers such as Youngblut (1977), Salzman, Dede, Loftin, Chen (1999), and Chee (2001). Virtual reality is highlighted for its benefits in the classroom, including improved student-teacher communication, the ability to tailor lessons to individual students' needs, increased student engagement, better progress tracking, and a window into the past, future, cosmos, and past. While there has been a proliferation of papers on the use of VR in higher education, few have centered on its potential applications in elementary schools.

While similar studies have been, are being, and will be conducted in other countries, no country has as much granular data for the suggested issue as Romania. The provided article can serve as a springboard for more publications or studies on the incorporation of virtual reality in the instructional-educational process, given the lack of a foundation in the Romanian region about the use of virtual reality in education. The essay catches the period of change of attitude of teachers and parents quite well, as it was published when, to the best of our knowledge, there were no data on the attitude of parents and teachers towards the integration of virtual reality in education. Because today's and tomorrow's youth are reared on a variety of electronic gadgets, educators want to take more risks, be more receptive to novel educational opportunities, and employ strategies to attract and encourage students.

Teachers and parents who took part in the study showed an openness to the idea of using VR in the classroom, suggesting that the article encourages readers to experiment with incorporating VR into their own classrooms. According to the article, both educators and parents are generally receptive to innovative approaches to education. What's the harm in taking advantage of the study's finding that parents and teachers have a favorable opinion of virtual reality in education and are receptive to its use?

Conclusion

As our technology improves, more and more useful and interesting educational resources become available. Virtual reality (VR) stands out

among these tools due to the myriad benefits it offers in the classroom. Virtual reality viewpoints are alluring because they have the potential to alter not only how individuals think, but also how they see and comprehend the passage of time and space. Using VR, we can experiment with novel methods of instruction. With its own set of benefits and the potential to pique the interest of educators, parents, and kids alike, it's inevitable that this technology will come to play a significant part in the classroom.

Research participants saw an example of an activity carried out by integrating this technology, and were given the chance to voice their thoughts on this model, although the advantages and benefits of virtual reality in education are not widely understood. Although many of the study's participants had never had direct contact with VR before, they have shown to be receptive to the idea of incorporating VR into the classroom. In conclusion, the findings of this research shed light on crucial areas of VR education integration. The findings are promising, and they suggest that we should prioritize figuring out how to use this technology in the classroom. The research presented necessitates extending to other educational cycles and trying to carry out activities through this technology, according to some educators and parents who support the use of virtual reality in the classroom. That's why it's important to advance the conversation by testing VR apps' efficacy in the classroom with elementary school pupils.

References

- [1] Ahrens, A., Zaščerinska, J., Melnikova, J., Ramar, H., Clipa, O., & Andreeva, N. (2015, October). Use of Webinars in Higher Education: A Comparative Study of Educators' Experience. In 3rd Annual International Scientific-Practical Application Conference Trends in Science and Higher Education Studies Under Conditions of Globalization. Panevėžys College, Panevėžys, Lithuania (pp. 22-23).
- [2] Biocca, F., & Delaney, B. (1995). Immersive virtual reality technology. Communication in the age of virtual reality, 15(32), 10-5555.
- [3] Bowman, D. A., & Hodges, L. F. (1999).

- Formalizing the design, evaluation, and application of interaction techniques for immersive virtual environments. Journal of Visual Languages & Computing, 10(1), 37-53.
- [4] Brooks, F. P. (1999). What's real about virtual reality?. IEEE Computer graphics and applications, 19(6), 16-27.
- [5] Clark, D. (2006). Motivation in e-learning. Brighton, UK: Epic. Retrieved March, 16, 2009.
- [6] Cline, M. S. (2005). Power, madness, and immortality: The future of virtual reality. Mychilo Cline.
- [7] San Chee, Y. (2001). Virtual reality in education: Rooting learning in experience.
- [8] In International Symposium on Virtual Education (Vol. 41).
- [9] Schipor, M. D., Cramariuc, G., Clipa, O., & PENTIUC, Ş. G. (2014). Relations between familiarity with touch interfaces and sensorimotor skills in preschoolers. eLearning & Software for Education, (2).
- [10] Sherman, W. R., & Craig, A. B. (2018). Understanding virtual reality: Interface, application, and design. Morgan Kaufmann.
- [11] Sutherland, I. E. (1964). Sketchpad a manmachine graphical communication system. Simulation, 2(5), R-3.
- [12] Youngblut, C. (1997). Educational uses of virtual reality technology. Executive report. Reprinted from Educational uses of virtual reality technology (IDA Document Report Number D-2128). Alexandria, VA: Institute for Defense Analyses, 1998. VR in the Schools, 3 (1).
- [13] Constantin, V. (2016). Realitate Virtuală. Modele educaționale, beneficii și întrebări deschise. Conferința Națională de Învățământ Virtual, XIV, 73-76.
- [14] Cramariuc, G., & Pentiuc, Ş. G. (2015), Observing motor development of preschool children using depth cameras. eLearning & Software for Education, 1.
- [15] Dionisio, J. D. N., III, W. G. B., & Gilbert, R. (2013). 3D virtual worlds and the metaverse: Current status and future possibilities. ACM Computing Surveys (CSUR), 45(3), 1-38.
- [16] Ellis, G. (2009). Grand challenges for engineering. IEEE Engineering Management

- Review, 37(1), 3-3.
- [17] Lewis, P. H. (1994). Sound bytes: he added'virtual'to'reality'. The New York Times,7.
- [18] Mantovani, F. (2003). Towards Cyber-Psychology: Mind, Cognitions and Society in the Internet Age, chapter VR learning: Potential and Challenges for the Use of 3D Environments in Education and Training.
- [19] Pimentel, K., & Teixeira, K. (1993). Virtual reality through the new looking glass.
- [20] Salzman, M. C., Dede, C., Loftin, R. B., & Chen, J. (1999). A model for understanding how virtual reality aids complex conceptual learning. Presence: Teleoperators & Virtual Environments, 8(3), 293-316.