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Message from the Editor-in-Chief

Dear Colleagues,

We are proud to say that TOJDEL publishes July, 2024 issue. This issue has international different papers from various fields are shared with professionals. It is a free online journal and offeres free Access to all articles. When the journals are free to access all published articles, it increases the level of impact factor.

TOJDEL is a multidisciplinary peer-reviewed journal in the field of distance education. TOJDEL welcomes the submission of manuscripts that meets the general criteria. TOJDEL is dedicated to increasing the depth of the subject across disciplines with the ultimate aim of expanding knowledge of distance education. TOJDEL is seeking for qualified and high profile researchers to join its editorial team as editors or reviewers.

TOJDEL thanks and appreciate editors who have acted as reviewers for one or more submissions of this issue for their valuable contributions. Any views expressed in these publications are the views of the authors and are not the views of the Editor and TOJDEL.

TOJDEL will organize International Educational Technology Conference **(www.iet-c.net)** at Harvard University Faculty Club. IETC series is an international educational activity for academics, teachers and educators. This conference is now a well known education event. It promotes the development and dissemination of theoretical knowledge, conceptual research, and professional knowledge through conference activities. Its focus is to create and disseminate knowledge about the use of educational technology.

Call for Papers

TOJDEL invites article contributions. Submitted articles should be about all aspects of distance education and e-learning. The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJDEL. Manuscripts must be submitted in English.

TOJDEL is guided by it's editors, guest editors and advisory boards. If you are interested in contributing to TOJDEL as an author, guest editor or reviewer, please send your cv to tojdel.editor@gmail.com.

July 01, 2024
Editor,
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ENGAGEMENT IN SOCIAL MEDIA ACTIVITIES AND IT'S IMPACT ON ACADEMIC ACHIEVEMENT AMONG POST GRADUATE STUDENTS

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ABSTRACT
Social media is experiencing rapid growth among the young generation worldwide. University students are actively engaging with various social media platforms. The goal of the current study is to examine how students use social media for a variety of Using Purposes, Time Spent in social media and the impact on Academic Achievement among postgraduate students. The total number of samples is 80 students, where 40 students selected from Cooch Behar Panchanan Barma University and 40 students selected from the University of North Bengal. In the present study the investigator followed quantitative approach and used descriptive survey method. The researcher should try to ascertain whether there is a significant difference in engagement with social media of postgraduate students on the basis of their Gender, social media Using Purpose and to explore if there are any differences in social media activities between postgraduate students from two Universities and find out the social media impact of two university's students. Also tries to examine Time Spent in engagement with social media and Academic Achievement of the Students. The result show that there is a substantial disparity in the engagement with social media of male and female postgraduate students and engagement with social media have no substantial impact on Academic Achievement. The investigator also found Time Spent in social media have no substantial impact on Academic Achievement.
KEYWORDS: Social media, Engagement with social media, Engagement in online Activities, Academic Achievement.

INTRODUCTION

Social networks have an impact on people's lives as well as communities. They have a number of benefits, but they also have a number of drawbacks, such as a negative impact on students' social lives and academic performance. These are causes for time consumption, people may become addicted to these websites (Ali Aljabry et al, 2017). Kaplan AM & Haenlein M (2010) defined that social media is the "Internet-based applications that allow the creation and modification of content which is user-generated". The term "social media" describes a group of internet content and platforms that let people interact with one another and share thoughts, emotions, and various types of content (Alahmar AT, 2016). Social media typically describes creating collaborative media and sharing it on a large scale because it is based on inputs due to interaction, collaboration, co-creating or sharing of own content. All the web 2.0 or online integrative application or synchronous and asynchronous applications are included in engagement with social media. Social media grew quickly, drastically changing the world in the process. This quick rise may be ascribed to a number of things, including social media's accessibility and simplicity of use and the availability of smartphones and tablets (Owusu-Acheaw & Larson, 2015). Social media offers benefits including easy access to information, quick and effective interpersonal communication, a tool for business promotion, and a collaborative atmosphere (Guedes E, et al, 2016). Additionally, social media plays several roles in education (Al-Khalifa HS & Garcia RA, 2013). We can read books, watch pictures, listen to music, converse with each other even when we're on other countries, and do a lot more things thanks to them. Our lives are simpler now that we are connected to each other through social media (Shensa et al, 2015). Social media gives students a forum for communication and learning. It is essentially an online application that allows students to create and exchange various types of study materials, such as information, files, photos, and videos, as well as create blogs and send instant messages. This serves as a good educational aid so that students can use the information for their projects, homework and research.

Background of the study:

Elias and Mirunalini (2021) performed study to examine how learners at higher secondary schools utilise social media relates to their academic performance. They collected and analysed data, revealing that the average value of social media usage is 60.65. This mean result suggests that the maximum number of pupils did not use social media and that usage did not differ significantly by locality, gender, or type of school administration. According to the correlation the study, there is only a very slight inverse relationship between academic success and higher secondary students' use of social media. David and Muthupandi (2021) conducted a study on "the social media habits of higher secondary students", the researchers found that students are extensively involved in social media

activities throughout various stages. They concluded that engagement with social media offers numerous advantages for academic activities. People may interact and communicate with his/her friends and relatives through social media. It allows students to understand something about learning, interact with classroom and laboratory, and enjoy learning process more. According to Rawath et al (2019), social media has both beneficial and harmful affects on our youth. This study investigates how social media affects students. The findings indicated that 20% of respondents claimed they had learned advantages/positive impacts from social media, while another 20% found advantages of engaging with friends on social media, 28% found benefits in enjoyment and entertainment, and 18% discovered job opportunities. Such advantages were obtained. The studies also show that social media causes health issues and culture is also affected by this. When using social media, users should keep cultural values and societal norms in mind. Aljabry et al (2017) conducted a research intended to ascertain the effect of social media on social interactions, academic achievement, and various aspects related to social media usage patterns. The result of the study show that Facebook was the most frequently visited website (53%), with 65.9% of learners who have been using social media for longer than three years and 58.5% spending two to four hours each day on them. When it came to Facebook and WhatsApp use, gender was a key role. The only significant difference across academic years was observed with WhatsApp, primarily utilised by fourth-year students (46.1%). Study intensity was influenced by both the quantity of hours and the use of social media during lectures. Bulu et al. (2016) looked at a number of sociodemographic variables, including class, gender, parents' academic backgrounds, socioeconomic status, memberships in social media communities, and tools used to connect social media accounts, in order to better understand the general attitudes of students towards using social media. The investigation's findings demonstrated that there were differences between the group's usage patterns of social media and the amount of time spent there. Additionally, studies showed that pupils had optimistic and upbeat attitudes toward using social media. Sarsar et al. (2015) undertook a single case study during the Autumn Semester of 2012–2013 in order to ascertain the opinions of 18 doctorate students at Ege University about how social media platforms are used in the process of teaching and learning. The result showed that every student completed the course to the expected standard and that they all had a good outlook on Facebook use. Only 50% of students, however, believed that Blogger was a helpful tool for the assignments. Mathew (2015) conducted research on social media and its impact on students' performance. According to the report, all social networking sites are highly known and accessible to higher secondary students. According to the research, notwithstanding their benefits, social networking sites are harmful for students, since their attention is more focused on talking, uploading images and comments, posting status, and so on, while their academic activities are ignored and harmed. Tariq et al (2012) found that using social media negatively effects on children's and teens' life and education. Thompson et al (2008) and Kirschner & Karpinski (2010) show that Student lives, academic performance, and the length of their studies are all impacted by social media.

NEED FOR THE STUDY

Social media are suitable for the academic and long-term learning functions in our information society. It is a virtually interactive digitally implemented technology which gives the opportunity to creation and exchange of information, knowledge, skills and various types of activities through the Internet in a virtual community and networks. The Usage or application of social media may vary from one person to another person, vary from one place to another place, also depend on class, gender, location of the university, use purpose, availability of computers or laptop, smart phone, internet accessibility, using time, types of social media, depends on use place and many more. But sometimes students use it various purpose just instead of academic purpose.

This study holds significance on multiple fronts. Firstly, it fills a gap in the existing literature by exploring the engagement of postgraduate students in social media activities and its influence on academic achievement. The lack of substantial research in this area makes the findings of this study valuable in expanding our comprehension of social media's impact on educational settings. Secondly, this study examines how social media use affects academic accomplishment, encompassing various types of usage purposes. As one of the initial studies to investigate this relationship comprehensively, it lays the foundation for further exploration and understanding of the multifaceted effects of social media on Academic Achievement. Overall, the study's findings are anticipated to shed light on the complex dynamics between social media engagement and Academic Achievement among postgraduate students, offering insights that can inform educational practices and policies in the digital age.

OBJECTIVES

The present research objectives are as follow:

1. To examine the difference in engagement with social media of postgraduate students on the basis of their Gender.
2. To identify the distinction between social media activity between Completed and Pursuing students of University of North Bengal(NBU) and Cooch Behar Panchanan Barma University(CBPBU).

3. To find out the difference between students of NBU and CBPBU in engagement with social media.
4. To examine the Using Purpose of engagement with social media between Pursuing and Completed students of NBU and CBPBU.
5. To assess the Effects of engagement with social media on Academic Achievement based on the groups of students who use it for Academic and Non-academic purposes.
6. To examine the difference in Academic Achievement of the Students with the respect of Time Spent in engagement with social media.

HYPOTHESIS

The following hypotheses are proposed by the investigator for the current study:

1. There is no statistically significant difference between postgraduate Male and Female students' engagement with social media.
2. There is no statistically significant difference of engagement with social media between Completed students and Pursuing students.
3. There is no significant difference between University of North Bengal(NBU) and Cooch Behar Panchanan Barma University(CBPBU) students' engagement with social media.
4. There is no statistically significance difference in Using Purpose of engagement with social media between Pursuing student and Completed student.
5. There is no statistically significant difference in engagement with social media between Academic and Non-Academic Using Purpose Groups.
6. There is no statistically significant difference in Academic Achievement of the Students with the respect of Time Spent in engagement with social media.

OPERATIONAL DEFINATION OF THE USED TERMS

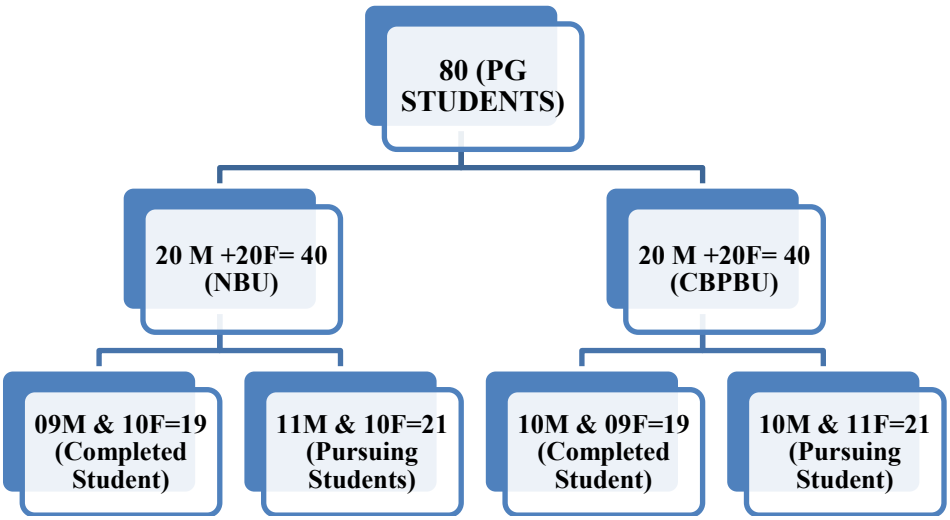
Gender: Researcher used the term Gender which means male and female students of the study.
Pursuing and Completed student: By this term researcher means that some of the students who are just doing their PG course and some of the students who are completed their PG course.
University: Researcher used the term university which is mean that the institution where the student pursuing and completed their degree. In the present researcher included two university one is CBPBU and another is NBU.
Academic and Non-academic using purpose Group: Students who utilise social media for educational purposes are included in the academic purpose group. Conversely, the non-academic purposes category consists of students who utilise social media for goals other than academics, such as communication, entertainment, general information, and so on.
Pursuing and Completed students: Pursuing students are those students who are still pursuing their PG course and Completed students are those students who did their Post Graduation course.
Time Spent: Time spent is defined as the amount of time each of these PG students spends on social media on a daily basis.

METHODOLOGY OF THE INVESTIGATION

Method of the study

In this investigation, the investigator used a survey as a method along with a descriptive research approach, through survey technique researcher using a self-made structured closed ended questionnaire to gather the quantitative data from the representative sample.

Sample: The universities were selected using the purposive sampling method, which are NBU and CBPBU, and 80 postgraduate students were selected randomly from these two universities. Among these 80 students, 40 were collected from NBU, where 20 were males and 20 were females, and 40 were collected from CBPBU, where 20 were males and 20 were females. Total male and female students are also categorized into two groups: one is the Pursuing Group and another is the Completed Group, where 09 male and 11 female students were chosen from NBU in the Completed Group, 11 male and 10 female students were chosen from NBU in the Pursuing Group, 10 male and 09 female students were chosen from CBPBU in the Completed Group, and 10 male and 11 female students were chosen from CBPBU in the Pursuing Group who are pursuing the PG course and completed the PG course from these two universities. These two universities are situated in the northern part of West Bengal.



***M= Male *F= Female**

Tools used in this study: In this study the researcher used a Social Media Usage Questionnaire for data collection, which was standardized by the expert and to measure the academic achievement of the students, researcher used the last year evaluation (final exam) score of the samples.

Statistical techniques: To analyze the collected data researcher used Mean, S.D and 't' test and ANOVA as a statistical technique for this study. Here the researcher used 't' test to know the difference between the two group mean.

Data analysis and interpretation:

Table-1: Activities on social media between two universities

Variables	Category	N	Most usable Social Media			
			Facebook	Youtube	Instagram	Whatsapp
			%	%	%	%
Gender	Male	40	65.00	57.50	52.50	90.00
	Female	40	70.00	75.00	50.00	97.50
Types of Students	Pursuing student	42	75.00	79.17	58.33	95.83
	Completed student	38	66.67	83.33	41.67	95.83
University	NBU	40	80.00	85.00	45.00	97.50
	CBPBU	40	52.50	72.50	50.00	90.00

****NBU= North Bengal University, *CBPBU=Cooch Behar Panchanan Barma University.***

Interpretation: Table 1 indicates the percentage of most usable social media application which is used all the PG the students of NBU and CBPBU.Where we see most of the student use facebook, youtube, instagram, whatsapp and the maximum usable application is whatsapp.

Figure 1 shows how these two universities' students use social media in various social media Platform.

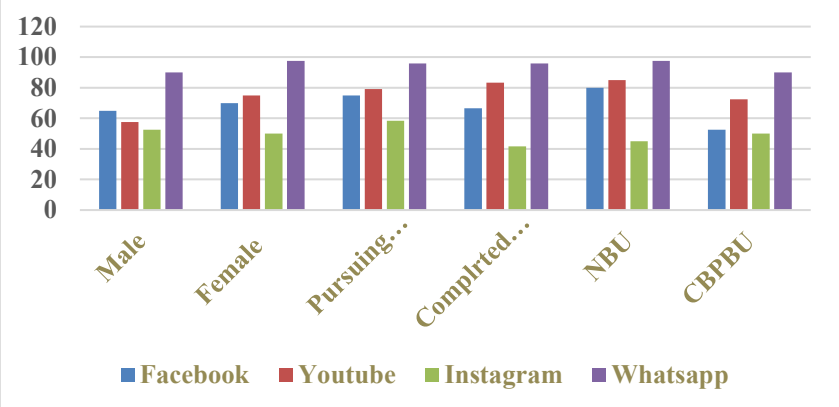


Table-2: Various social Media activities among post graduate students and with their concerning set of variables

Hypothesis	Variables	Sub-variables	N	Mean	SD	P-value	t-value	Observation at 5% level
$H0_1$	Gender	Male	40	66.25	16.645	1.99	6.154	S
		Female	40	73.125	19.512			
$H0_2$	Types of Students	Pursuing Students Group	42	77.082	15.403	2.02	2.519	S
		Completed Students Group	38	71.875	23.412			
$H0_3$	University	NBU	40	76.875	22.488	1.99	8.275	S
		CBPBU	40	66.25	18.763			

S= Significant

Interpretation: Table 2 firstly demonstrates that the engagement with social media differs in Post Graduation students on the basis of their gender. In this case the computed 't' value (6.154) is more than the p-value (1.99) at the 0.05 level. Thus, the null hypothesis $H0_1$ is rejected. As a result, there is a substantial disparity in the engagement with social media of male and female postgraduate students like facebook, youtube, instagram, whatsapp etc.

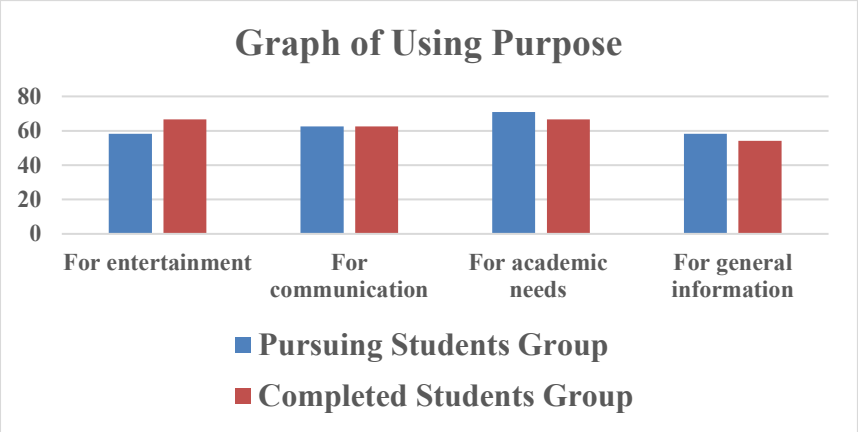
Secondly indicate that the engagement with social media differs between Completed Students Group and Pursuing Students Group. Here the computed 't' value is 2.519 which is more than 2.02 at 0.05 level. Thus, the null hypothesis $H0_2$ is disproved. As a result, there is a substantial disparity in the engagement with social media between completed students and pursuing students of NBU and CBPBU.

Finally, demonstrates that the engagement with social media differs between NBU and CBPBU students. In this case the computed 't' value (8.275) is more than the p-value (1.99) at the 0.05 level. Thus the null hypothesis $H0_3$ disproved. We may therefore say that there is a considerable disparity in social media activity between NBU and CBPBU students.

Table-3: Types of post graduate students in social media activities on the basis of Using Purpose

Variable	Category	N	Using Purpose			
			For entertainment (%)	For communication (%)	For academic needs (%)	For general information (%)
Types of Student	Pursuing Students Group	42	58.33	62.50	70.83	58.33
	Completed Students Group	38	66.67	62.50	66.67	54.16

Figure-2 show the students' social media engagement on the basis of their Using Purpose



Interpretation: Table 3 indicates that types of Post Graduate students' engagement with social media on the basis of Using Purpose. The Pursuing Group use social media for entertainment purpose 58.33%, for communication purpose 62.50%, for academic purpose 70.83% and for general information purpose 58.33%, In the case of Completed Students group use of social media for entertainment purpose 66.67%, for communication purpose 62.50%, for academic purpose 66.67% and for general information purpose 54.16%.

Table-4: Pursuing Student and Completed Student in social media activities on the basis of Using Purpose.

	Variable	Sub-category	N	Mean	SD	P-value	t-value	Observation at 5% level
$H0_4$	Types of Student	Pursuing student`	42	62.497	5.892	2.07	0.004	NS
		Completed student	38	62.50	5.897			

NS= Not Significant

Interpretation: Table 4 tries to illustrate that there exists any significant difference or not and after analyze the data researcher found that there exists no significance difference of Using Purpose of social media activities between Pursuing Student and Completed Student. In this case the computed 't' value (0.004) is less than the p-value 2.07) at the 0.05 level. Thus, the null hypothesis $H0_4$ is accepted. As a result, it is reasonable to draw the conclusion that there is no visible difference in Using Purpose of Completed Students and Pursuing Students' (who are still pursuing their PG degree) engagement with social media.

Table-5: Academic Using Purpose Group and Non-academic Using Purpose Group in social media engagement

	Types Student	N	Academic Achievement (Mean)	SD	P-value	t-value	Remark at 5% level
$H0_5$	Academic Using Purpose Group	26	48.69	35.04	2.01	0.464	NS
	Non-academic Using Purpose Group	26	49.71	34.99			

NS= Not Significant

Interpretation: Table 5 try to illustrate that Academic Using Purpose Group and Non-academic Using Purpose Group in social media engagement. Here the researcher creates this group on the basis of academic using purpose, one who are use social media platform for the academic purpose fall Academic Using Purpose Group and on the other hand one who are not use social media platform for the academic purpose fall Non-academic Using Purpose Group. These two groups were created from those 80 samples, where 26 students used social media for academic purposes. That's why they fell into the Academic Using Purpose Group, and another 26 students were randomly selected from the remaining 54 students who did not use social media for academic purposes. That's why they fell into the Non-Academic Using Purpose Group. On the basis of objective-5, researchers attempted to determine whether or not there is a difference between Academic Using Purpose Group and Non-academic Using Purpose Group in terms of social media engagement and found that Academic and Non-Academic Purpose Groups do not significantly differ from one another. In this case the computed 't' value (0.464) is less than the P-value (2.01) at the 0.05 level. Hence the null hypothesis $H0_5$ is accepted. As a result, we may conclude that engagement with social media have no substantial effect on Academic Achievement.

Table-6: Time Spent on engagement with social media and Academic Achievement of the Students.

	Time Spent	N	Academic Achievement (Mean)	SD	P-value	F-value	Remark at 5% level
H_0-6	As needed/Day	22	73.88	7.59	2.33	0.620	NS
	1-2 Hours/Day	32	70.89	13.79			
	3-5 Hours/Day	26	73.15	7.24			

NS== Not Significant

Interpretation: Table-6 try to illustrate that Time Spent on engagement with social media and Academic Achievement of the Students. Here the researcher creates three groups on the basis of Time Spent on

engagement with social media. The first one is who were use social media when they need to use social media according to his/her personal requirement in a day. This kind of sample fall in As Needed/Day Group and the size of this group is 22. Second one is who were engagement with social media 1 to 2 hours in a day. This kind of sample fall in 1-2 Hours/Day Group and the size of this group is 32. Last one is who were engagement with social media 3 to 5 hours in a day. This kind of sample fall in 3-5 Hours/Day Group and the size of this group is 26.

On the basis of objective-6 researcher attempted to examine the difference in Academic Achievement of the Students with the respect of Time Spent in engagement with social media. After analyze the data the investigator found the F-value 0.620 which is less than the P-value (2.33) at 5% level. As a result, we may conclude that there was no difference in Academic Achievement among these three groups and Time Spent in social media have no substantial impact on Academic Achievement.

MAJOR FINDINGS

This study tries to examined the engagement with social media and its impact on Academic Achievement. The results indicated that the maximum number of students utilize social media like whatsapp, facebook, instagram and youtube for their daily life. Female students are used the social media maximum than the male students. In the present study also revealed that the mean score 77.082 of Pursuing Student and the mean score 66.67 of Completed Students are significantly differ to each other and they are use social media in their own way. In the case of two universities the researcher found that the mean score 76.875 of NBU students and the mean score 66.25 of CBPBU students are also significantly differ from each other and both the universities students use social media for their own way but in the case of Using Purpose there are no significant differences, they mostly utilize social media for the same reasons, such as amusement, communication, academic needs, and general information. Both the university students do not affect by their Academic Using Purpose of the social media. Lastly there was no difference in Academic Achievement on the basis of Time Spent.

CONCLUSION

In present day every student use or involved with social media activity. This is the great revolution in our society which is greatly influenced of our every aspect of social life. Social media are a repository of various type of information. Every student can get their required information via various types of social media like facebook, unacademy, youtube, linkedin, slideshare, blogs etc. Students can create a learning environment each other where they can share their knowledge and skills and gain knowledge and skills. It is one of the best board platform that student can connect with anyone in the world. Social media is a great place to interact with student to student, student to teacher, teacher to teacher for their academic and others purpose.

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INTEGRATING TECHNOLOGY INTO EDUCATION: A NEW PARADIGM AND A PANACEA IN COVID-19 PANDEMIC

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ABSTRACT
In times of uncertainty, survival requires an immediate response, and this paper is a study of how technology has been a panacea to deal with the uncertainty of schooling during the pandemic. The outbreak of COVID-19 forced educators to switch to an online mode of education in order to provide a possible solution to students to continue their education. The paper emphasizes the significance of incorporating technology into education at mass level; it also examines a paradigm shift to online mode of education. The paper will be a helpful document for policy makers to frame the futuristic policies based on integrating technology into education in order to deal with different and uncertain situations.
Keywords: COVID-19, Online Education, ICT, Paradigm Shift, Panacea

Introduction

The outbreak of Coronavirus (Covid-19) which has been declared as pandemic by World Health Organization (WHO) in March 2020, resulted in disrupting many aspects of our lives, especially our education sector. All the educational institutions were shut because of the spread of deadly virus of Covid-19. The teaching learning process in schools was shifted from offline mode of teaching to the online mode. There was no option left for the education sector but to shift entirely to an online mode of teaching learning which is the only panacea left for continuing the teaching learning process in schools in order to deal with the current situation of coronavirus pandemic. Earlier the educational institutions even most of the teachers were hesitant to go for online mode of teaching. Now everyone has realized that the scenarios are changing so is to change the nature of teaching and learning. The coronavirus pandemic has make us realize that we should frame our teaching learning policies in such a way that we should always be ready to deal with the coronavirus pandemic like situation so that our teaching learning process may not get interrupted anymore in future.

Although online education was generally not a new concept for educators, the COVID-19 pandemic created an unprecedented global need to explore online teaching/learning opportunities across the field of education. According to the UNESCO, since the beginning of pandemic, more than 1.6 billion students globaly (94% of total enrolled learners) have been affected by the COVID-19 closures and consequent educational changes. The sudden outbreak of coronavirus resulted in closure of most educational institutions around the world which forced the conversion of the face-to-face instruction into a fully online (or blended/hybrid) mode in a very short period of time. As a result, academic institutions that were mainly focused on traditional face-to-face instructions encountered different challenges in this conversion. Technology integrated education is more flexible and cost effective in terms of providing online education to the students. While as physical education or in-person education is costly and lacks flexibility in nature. During this pandemic it is the education sector which has been disrupted the most across the globe. So to keep the knowledge retention steady within students it is necessary to use e-learning and remote teaching which is proven to be more imperative. The technology integrated education is more student centered than face to face education. While the teaching learning process took place through online mode, it becomes more innovative, flexible and student centered as the students are more motivated towards online learning because of its flexible nature. Online learning may be defined as the learning process which takes place in synchronous or asynchronous mode using various devices such as computers, mobile phones etc. with the help of internet access. In this mode of learning students are independent to learn as there is no fixed time or place for learning, students can interact with their teachers and also with their classmates anytime and anywhere which makes it more student centered (Singh & Thurman, 2019). The synchronous learning took place in real time where the students interact with their teachers and gets instant feedback in a real time situation while attending live classes. The asynchronous type of learning took place through online prepared resources and it is without real time interaction with teacher (Littlefield, 2018). So there is paradigm shift in the system of education from in-person or face to face teaching to online mode of education which is an important solution to deal with the pandemic. Now it is important to take into consideration while framing the futuristic policies of education that our schooling may not get hampered in future. So it is our duty to encourage the policy

makers and stakeholders to frame such policies which are based on integrating technology into education for the sake of securing the future of our students and for the continuity of education and also to deal with such kind of uncertain situation in totality.

Purpose

The purpose of the current paper is to study that how coronavirus pandemic has forced the educationists to shift face to face in-person education to online mode of teaching learning during the pandemic and also how technology integrated education is a necessity and the only significant alternative panacea available for dealing with the coronavirus pandemic like uncertain situations.

Online Education an Obligation in COVID-19 Pandemic

Since most of the world countries have been affected by Covid-19 pandemic resulted in disrupting all the aspects of normal life of people throughout the globe. To counter this pandemic the technological world has come to rescue all the aspects of life especially the education sector. The only necessary option left for continuing the teaching learning process is to go far online education. Most of the schools not only in India but across the world have shifted to online mode of education which has emerged as the only alternative to face to face traditional learning. The Covid-19 pandemic like uncertain situations and the other natural disasters poses a great threat on the education of the students by the closure of schools and resulting in depriving the students of their fundamental right to education. Covid-19 hampered the education by imposing lockdowns, corona curfew, closure of schools and maintaining social distancing, so in these conditions we have no other alternative but to move towards online learning. Any kind of crisis is the biggest obstacles in the field of education. The education sector has been boosted in times of corona crisis as it brings a technological revolution in the field of education by integrating technology into education and making teaching learning online. Schools should be flexible to adopt new ways of teaching and learning during the time of crisis and disasters (Chang-Richards et al., 2013). To make the future of the students secure it is necessary to go for suitable alternative ways of teaching and learning and this can be done by integrating technology into education which is the only panacea available in covid-19 crisis. So to deal with Covid-19 crisis and such other uncertain circumstances in future the online education is not an option but an obligation to be utilized for continuing the education and it also helps us to prepare ourselves for future and make planning in such a way that our education system will never get hampered even in unprecedented times of crisis and natural disasters.

Impact of COVID-19 on Schooling

The nationwide lockdowns implemented during covid-19 to curb the spread of the coronavirus have disrupted traditional face to face schooling at a large scale not only in India but across the globe. The disruption due to covid-19 pandemic has affected nearly 1.6 billion students in more than 190 countries. Due to this pandemic and closure of schools has impacted 94% of student population across the globe. The UNICEF has reported that in India nearly 247 million children enrolled in elementary and secondary education and 28 million children enrolled in pre-schools and Anganwadi centers have been affected by covid-19 pandemic. As for as the continuity in learning is concerned the educational sector have made great efforts to retain the continuity of schooling in the covid-19 crisis. Students mostly depend on the resources available to them for continuing their learning remotely through different gadgets like television, radio or internet etc. It is necessary for the teachers to shift the methodology of teaching to online mode and adopt the novel concepts of pedagogy to teach the students, but the teachers feel hesitant to adopt the new pedagogy as they are not skilled and they have not been given the appropriate training to utilize this new pedagogy into teaching. There are many learners who don't afford to access the resources of digital learning mostly belongs to marginalized community and also have lack of resilience and engagement on the pace of their own learning, are at the highest risk of their learning losses. Different research findings revealed that the learning losses and increasing inequality in education is a common factor in times of covid-19 crisis and that happens mostly because of digital divide among the students. Children from well off and educated families received a good attention and support from their parents than socioeconomically disadvantaged children and also less educated parents. Due to the closure of schools and increasing digital inequality the students are lagging behind in learning and many students have also left the education for life time and started earning the livelihood for their families as a whole. Now it is the government's responsibility to take necessary action and should raise the funds for these marginalized groups to support their education and safeguard the students right to education so that they may become able to continue their learning with other privileged students. The policy makers and stakeholders should focus on strengthening the ICT infrastructure in the educational institutions and bridge the gaps of digital divide among the students in order to achieve the goals of sustainable development.

COVID-19 and Online Pedagogy

For implementing the lockdown and social distancing measures effectively during Covid-19 pandemic all the sectors of life have been shut including the closure of educational institutions in most of the countries around the world. For continuing education in times of Covid-19 crisis education is delivered through various online platforms which leads to paradigm shift in the pedagogy of teaching and learning. Instead of the challenges faced by both the teachers and the students the online education is the only panacea for this uncertain situation of global covid-19 pandemic. The entire system of education and the process of teaching and learning being forced to adopt a system for which they are not prepared. While the schools and universities have been shut the online learning tools played a significant role in helping and facilitating the students learning during covid-19 pandemic (Subedi et al., 2020). With the help of online learning the physically challenged students are allowed to take part in teaching learning with more extended freedom and requiring limited movement in the virtual environment (Basilaia & Kvavadze, 2020). Online learning pedagogy is the only suitable solution to all problems of education in any situation. There are variety of subjects and students of varying age groups which require different online teaching learning approaches (Doucet et al., 2020).

The teachers and students should be skilled in operating the tools of online learning platforms which are appropriate pedagogy for online education. It is recommended that government should organize the training programmes for the teachers so that they will not face any difficulty in operation tools which are meant for online education and by this it is possible to achieve the target of integrating technology into education so that the process of teaching learning cannot be disrupted anymore mostly in the times of natural calamities and any other uncertain situation. There are different online platforms which are being used on an unprecedented level to ensure the continuity of teaching and learning. So in the times of covid-19 crisis there occurs a paradigm shift of the teaching pedagogy and most of the teaching learning process shifted from face to face learning to online mode. Now it is recommended to the to the policy makers and stake holders to frame such policies which encourages the online pedagogy and make provisions for implementing such polices in future which supports online mode of education so that no student should be denied from right to education.

E-Learning initiatives during Covid-19 pandemic

As the outbreak of covid-19 was sudden and unexpected, the government organizations and the stake holders of educational institutions were not sufficiently ready to deal with this pandemic. The government takes every possible step during covid-19 in order to ensure the equity and continuity of learning. During this period of pandemic efforts are being made by the State and UTs to bring education to the doorsteps of every student through e-learning platforms which is admirable and an important sign of leveraging the impact of covid-19 in India. The government makes available the alternative e-resources during the closure of schools due to covid-19 for continuing education. Following are some of the e-learning resources made available to the students by the government.

DIKSHA (Digital Infrastructure for Knowledge Sharing): This is one of the online resources made available by the government leveraged in the times of covid-19 pandemic. DIKSHA was launched in September 2017. DIKSHA has more than 80,000 e-content available in many Indian languages, catering to 1-12 schooling Grades.

VidyaDhan: Government of India Launched VidyaDhan in April 2020 as a common national program to develop and contribute e-learning content to leverage the DIKSHA platform.

PM eVidya: PM eVidya was launched in May 2020 is a unique and innovative endeavor by the Government of India which is a inclusive initiative aimed at unifying all efforts to digital, online and on-air education to facilitate multi-mode access to digital contents of different types among students and teachers.

SWYAM PRABHA: is a digital initiative by the Government of India which is comprised of 32 TV channels for both school education and higher education which can be viewed on DTH service on 24/7 basis across the country. The efforts are being made to develop the contents and topics in chapter and topic wise to ensure the asynchronous usage by everyone anywhere and anytime in future.

NATIONAL REPOSITORY OF OPEN EDUCATIONAL RESOURCES (NROER): A portal equipped with best quality informational content on diverse topics in multiple languages a total of 14527 files including 401 collections, 2779 documents, 1345 interactive, 1664 audios, 2586 images and 6153 videos on different languages. NROER has approximately 17,500 pieces of e-content of The National Council of Educational Research and Training (NCERT) and other collaborative partners. The materials are available for various school subjects.

e-PATHSHALA - A web portal and mobile app designed and deployed by the National Council for Educational Research and Training. It has 1886 audios, 2000 videos, 696 e- ebooks (e-Pubs) and 504 Flip Books for classes 1st to 12th in different languages.

In addition to the above there are other various resources available which are being deployed by NIOS (National Institute of Open Schooling), Indra Gandhi National Open University (IGNOU), University Grants Commission (UGC), National Council for Educational Research and Training (NCERT). The efforts are being made by the government of India to upgrade the digital learning tools and working hard to bring new digital initiatives in future (post covid-19 pandemic). EdTech companies are supporting the government in facing the challenges posed by covid-19 and also help to overcome the unprecedented crisis of covid-19.

Discussion and Conclusion

The sudden outbreak of the deadly covid-19 pandemic has affected all the spheres of our life including the education sector at a large scale and altered the way of teaching and learning. To deal with the covid-19 pandemic and to find the alternate solutions to our problems, we need to bring some innovative changes most specifically in our education sector. To continue the education in times of covid-19 crisis we have no other alternative left but to shift the teaching learning process to online mode and securing the future of our students. The pedagogy of teaching has altogether shifted from face to face education to online mode of teaching learning for which neither the educational institutions nor the teachers as well as students were prepared. Adopting the changes in the times of crisis has boosted the education sector and it will bring tremendous innovative developments and upgradation in the education sector in the long run. Although the integration of technology into education has been started earlier but during covid-19 pandemic it gets wings and makes rapid progress in upgrading and adopting the innovative technologies and strategies to follow. This unpredictable outburst of the crisis taught us that scenario planning is a must to deal with such kind of challenges.

A great deal of preparedness and training should be needed in order to deal with the crisis and accept the changes and acclimatize according to the different situations present at the time of crisis or any kind of uncertainty. The availability of ICT infrastructure should be available in the institutions in the severe situation of pandemic and other natural disasters. The e-learning resources, e-contents, Massive Open Online Courses etc. should also made be available in such situations. The different online platforms like ZOOM, Google meet, Skype etc are of tremendous importance for conducting online classes and meetings. There are various ICT initiatives taken by the Government of India like DIKSHA, VidyaDhan, PM eVidya, SAYAM PRABHA etc. for benefiting the students and securing their right to education. The flexible and cost effective feature of online education helps the students to achieve the goals of learning and continue their education.

It is really unfortunate that there are students who do not have the accessibility and necessary technological gadgets to be benefited by this technology integrated online learning. Many students are lagging behind because of non availability of resources and lack of internet or almost nonexistent internet in the remote areas is suffering from the learning losses. The most of the students belonging to marginalized groups are not able to buy a simple smart phone or any such type of gadgets for learning purpose. Although government is trying hard to reach every student through emergency remote learning program like Radio broadcasting and through different free DTH TV channels etc. Government of India is doing a commendable job for safeguarding the right to education of every child but instead of this a lot needs to be done for bridging the digital divide and inequality among the students so that no student lag behind. Now it is the responsibility of policy makers and stakeholders to take necessary action and frame the policies that will be of outmost importance and applicable in the pandemic and natural disaster like severe situations and that will ensure the right to education to each and every student so that no student will suffer if such unprecedented situation occurs in future.

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ONLINE TEAM DISCUSSIONS: MAKING STUDENT ENGAGEMENT WORTH THE EFFORT

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ABSTRACT:
Facilitating robust engagement in an online, asynchronous course can be difficult. Learning management system discussion boards are often recommended to promote interaction and learning. However, there are many concerns associated with discussion board use such as disengagement, time lags, and inappropriate use of artificial intelligence. The instructor of a required graduate public health course delivered asynchronously online developed and implemented an alternative to discussion boards that required small groups of students to record and submit their discussions. Team members prepared for the discussions by first reviewing course module content and completing an individual assignment. The group discussions required learners to utilize higher-order skills in responses to structured prompts and were graded for depth and participation rather than accuracy. Midsemester feedback survey data indicated that students accepted the recorded discussions and found them valuable. Survey data also enabled the instructor to make small adjustments as needed and recommend best practices for the implementation of this online discussion activity in other courses.

Background
Educators continue to rely on a variety of course formats to meet learners' needs. Online, asynchronous classes can solve many logistical difficulties such as distance from a physical classroom and personal difficulties such as needing time to compose one's thoughts before participating (Morse, 2021; Clinton and Kelly, 2019; Dailey-Herbert, 2018; Hratsinki, 2008). However, facilitating robust engagement with course content and interaction among learners in these environments can prove challenging (Kaur et al, 2021; Su and Guo, 2021; Watts, 2016; Moallem, 2015; Gao, Zhang, & Franklin, 2013; Dahlstrom, Brooks, & Bichsel, 2014). Learning management system (LMS) discussion boards are often recommended to engage learners and promote interaction.

Discussion boards enable users to write/record and respond to posts consisting of text, images, videos, and links. Despite the convenience provided by discussion boards, several limitations have been noted (Sweetman, 2020; Aloni and Harrington, 2018; Al-Shalchi, 2009; Park and Bonk, 2007). The benefit of allowing students to participate asynchronously usually comes at the expense of a "true" exchange of ideas. Many instructors find that students create the specified number of posts and responses- engaging at a more superficial level- to fulfill an assignment's minimum requirement and then discontinue engagement with the discussion board (Champion & Gunnlaugson, 2018; Lamit et al, 2017; McCrory, Putnam & Jansen, 2008; Meyer, 2007). Instructors may also have concerns about students quickly generating content to post through artificial intelligence software such as ChatGPT and avoiding authentic engagement entirely (Cline, 2023). Some learners report that the potential time lag between their peers creating and answering posts creates a cumbersome wait and the hassle of frequent checking for new posts (Park and Bonk, 2007; De Freitas, Billy & Crain, 2023). This time lag may also disrupt instructors' ability to return feedback on posts or participate in the conversation themselves in a timely manner.

These issues are not unique to any one type of course and have been reported in the educational scholarship associated with several subjects and fields (De Freitas, Billy & Crain, 2023). Although the limitations of discussion board participation have been previously described, there is an opportunity to better document them within public health courses and offer a potential solution replicable to many diverse types of classes.

Course Description & Problem

A required graduate-level management course within the college of public health of a large, midwestern R-1 university was adapted from a synchronous in-person format to an asynchronous online format to support distance learners. The course introduces public health students to theories and practice of administration. During the semester's progress, learners develop skillsets associated with the management functions of planning, organizing, leading, and controlling.

Recognizing that other, related managerial skills such as conflict resolution and group decision-making techniques develop more effectively and efficiently in situations where learners are face-to-face, a decision was made to alter plans for how learners would participate in the course. The decisions regarding course improvements were guided by quality enhancement and management theory such as Deming's "Plan-Do-Study-Act" Model. This model enables users to improve a process by identifying an opportunity for change (here, the need to improve assignments associated with discussion boards) and then creating an alternative plan. Once the plan is implemented, outcomes of the plan implementation are studied, and then contribute to a decision regarding whether to continue, adjust, or discontinue the current plans (W. Edwards Deming Institute, n.d.).

In addition to the guidance from quality enhancement and managerial theory, several other important considerations also impacted the decision to alter how learners would participate in the course. First, an engagement method or strategy was needed that was low hassle, making it more acceptable to students. The engagement method also needed to be perceived by students as value-added to the course, benefiting their efforts. Finally, the method needed to avoid creating additional burdens on the instructor for tasks such as course management and grading.

Innovation

The course was divided into fifteen modules available on the university's LMS. Each module included several brief lecture videos and readings to provide a formative understanding of course concepts. Students were required to complete an individual assignment graded for accuracy. Most modules also required participation in a group discussion or team assignment. To enhance engagement and address considerations of student and instructor time and perceived benefit, the instructor required students to participate in synchronous team discussions rather than post on discussion boards.

These group activities were designed to utilize higher-order skills such as synthesis, and teams were provided with structured prompts for each meeting (Anderson, Krathwahl & Bloom, 2001). The team meetings were convened via Zoom, recorded, and then uploaded to the LMS. The students were instructed to limit the team discussion to one hour, even if they were unable to complete all components of the prompt. The instructor viewed the recordings and offered feedback to guide the students in their initial attempts to apply new concepts. Grading for team discussions was based on the depth of discussion and participation, and no points were deducted for mistakes. An example of the individual assignment and team discussion prompts is provided in Table 1.

Table 1. Individual and Discussion Prompt Example

	Module 8: Coaching & Mentoring Prompts	Bloom's Taxonomy Level
Individual Assignment	What is the difference between mentoring and coaching? As a new public health manager, how would you seek out a mentor or coach? What would you hope to gain from the relationship?	Remember, Understand, Apply
Team Discussion	• Review the potential organizational benefits of effective coaching. Which do you think is most likely? • With all the benefits, why is coaching (still) rare? • Coaching takes time. Talk through the "business case" you would present to your supervisor to request the time to devote to it. • Every employee might not respond to mentoring and coaching. Talk through how you'd decide whether to use it. • Give characteristics that you believe would signal that an employee would benefit from coaching. • What characteristics would cause you not to attempt coaching?	Analyze, Evaluate, Create

Methods & Results

Students were surveyed at three points in the semester to provide timely feedback about the recorded discussion group activities. When practical, immediate adjustments were made to solve problems and better meet student needs based on student feedback. The survey's open-ended responses were categorized as ideas to "continue", "stop" or "start". Table 2 contains examples of actions taken in response to the feedback gained from the first survey. The second survey offered students an opportunity to rate their feelings toward discussion groups. Six of the seven students who responded indicated a positive reaction. The remaining student was neutral.

Table 2. Examples of Feedback Received and Actions Taken (Survey #1)

Category	Actions Taken	Feedback Received
Continue	Praise efforts made to expand beyond discussion prompts.	*"Group meetings really helped me understand the topics we were going over. It was refreshing to meet with classmates despite this being an online course. These meetings often prompted thinking and reasoning beyond the weekly topics which I found to be helpful in connecting the course material."*
Stop	Eliminate redundancy between individual and team discussion prompts.	*"Too much redundant busy work - no reason to do a team discussion and then an individual assignment covering the same questions."*
Start	Allow students to miss one team discussion without penalty.	*"I would prefer if we were able to choose our groups based on availability. Scheduling has been very difficult."*

Discussion, Limitations, & Lessons Learned

Although the surveys were somewhat limited by a modest response rate (41.2%) and data from only a single semester, student data indicates that the course's use of recorded team meetings achieved several outcomes. In support of previous findings, the recorded team meetings appeared to allow students to better construct social presence and get to know one another, becoming a more cohesive small group in the process (Milovic and Dingus, 2021). The use of recorded team meetings also facilitated skill development and the students having a more authentic exchange of ideas and questions than a discussion board could facilitate while maintaining the course's basic format. Beyond immediate adjustment, feedback was also used to improve the design of subsequent iterations of the course. These efforts have produced a series of recommendations for implementing recorded group discussions in other classes. These recommendations are summarized in Figure 1.

Figure 1. Recommendations for Implementing Recorded Team Discussions

1. Require an individual assignment designed to assist students in gathering and organizing thoughts (e.g., basic understanding of concepts) be completed *prior* to the team discussion.

2. This pre-work will be a safeguard to minimize opportunities for disengagement that may arise from students coming to group meetings unprepared.

3. Use team discussions only for modules with topics which benefit from engagement (e.g., value-add for students).

4. Make the connection between individual and team assignments transparent. Focus on how the assignments relate rather than duplicate.

5. Offer an alternative path for students unable to participate in team discussions.

6. Assign team membership based on student availability.

7. Provide a time limit for discussion (rather than require the completion of tasks).

8. Provide feedback to foster interaction and engagement.

9. Allow each student to miss one team discussion without penalty.

Conclusion

How best to engage students continues to be a topic of frequent discussion and research. Although voices from a variety of fields have provided viable solutions and suggestions, there continues to be no singular "best" method to engage students and no one recommended strategy to inspire participation and an exchange of ideas. This paper adds to this growing body of research with a successful strategy inspired by quality enhancement and management theory that was implemented in an online, asynchronous public health course. The use of recorded discussion groups to replace traditional LMS discussion boards is ongoing in this course and will be utilized in other public health courses at the institution based on positive feedback received from learners.

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PROBLEMS ARISING FROM CHILDREN'S USE OF DIGITAL TECHNOLOGIES AND SOLUTION SUGGESTIONS

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ABSTRACT
In recent years, children's socialization and games with peers in neighborhoods and parks have become virtual games in which they spend their free time in front of the computer. Today, many digital games have emerged with the effect of technological developments. Playing digital games and using social media for long hours causes many social, physical and psychological conditions. Excessive use paves the way for many diseases and mental health problems. Especially in recent years, applications to clinics have increased due to the problems created by digital games. When the literature is examined, there are limited studies on children's digital gaming tendencies.
The aim of this study; To raise awareness that children will experience physical and psychological problems due to excessive and aimless use of technology and to draw attention to the issue by making a short compilation on the subject.
Keywords: technology use, virtual game, psychological problems, technology addiction

Introduction

When it comes to the unconscious use or abuse of technology, the first thing that comes to mind is the uncontrolled, unlimited and purposeless use of technology (Dinç, 2015). This type of use is a type of use that affects the life of the person in a way that disrupts daily life and responsibilities, and also includes many situations such as unnecessary long-term use, exposure of children to inappropriate content, and negative effects on physical, social, psychological and mental development (Küçükvardar & Tİngöy, 2018).

These problems appear in the form of negative effects on physical development and psychological (spiritual) and sociological problems. In particular, disruption of sleep patterns is one of the most common problems. Children and adolescents sleep less in order to watch more television, access the internet more, play more digital games, or message with friends (Bağcıçetin, 2023; Erden & Bulut, 2023). It has been observed that children's aggression level and impulsive behaviors increase when sleep patterns are disrupted and the needed 6-8 hours of sleep are not obtained (Choi, Son, Park et al. 2009). On the other hand, it is known that children who have attention deficit problems and thus whose learning process is negatively affected are exposed to excessive and unconscious use of technology. However, the problems caused by the unconscious use of technology are not limited to these. Scientific studies have shown that children who use unconscious technology have significant nutritional problems; It has been shown that sugary foods and "fast food" consumption are too much in order to save time in people who are addicted to technology (Yam & İlhan, 2020). Although this situation causes an unbalanced and unhealthy diet and excessive weight gain of the person, it has shown that impulsive behaviors increase due to the fact that the energy taken into the body more than needed is not excreted through physical activities (Muslu & Gökçay, 2019). Thus, children and young people who are pushed to a sedentary life suffer both physically, mentally and psychologically (Park, Kim, & Cho, 2008). The main thing is that the individual knows himself in line with his interests, talents and abilities, is aware of the pros and cons, develops his deficiencies and is at peace with himself. However, the unconscious use of technology stands as an obstacle in front of all these factors that are very important for the individual and has the power to affect their entire lives. The equivalent of this situation in the cause and effect cycle can be described as follows: With the aimless and unlimited use of technology, the individual will not be able to ask himself the questions necessary for his psychological development or will not have the opportunity to ask himself, and he will not be able to use the time, which is his most valuable asset and cannot be returned, as well as missing the opportunity to invest in himself in a positive way. Since the person uses technology unconsciously, it can become very difficult for him to manage his emotions, strengthen his will and have a say in himself, focus on a goal and pursue it. Due to all these negative feedbacks, the need for regular and in-depth relationships necessary for social development cannot be met in the abuse of technology, and this situation negatively affects social development and causes communication problems (Çeliker & Aşiroğlu, 2020).

A number of attitudes and behaviors are needed for mental development to be healthy. These are: turning to accurate and useful sources of information, reading, seeing, thinking, using information channels correctly, keeping the mind clean. The use of technology causes the person to fill their mental capacity with unnecessary information in a way that wastes it, and if the information cannot find a place in that capacity, if false and harmful information negatively affects the quality of life of the person, or if the mind is filled with entertainment images that are watched and forgotten, there is abuse of technology (Batman, Güngör & Korkman, 2023; Muslu & Gökçay, 2019; Rock, 2023; Brother, 2020).

Concepts (Addiction, Behavioral Addiction, Technology Addiction)

Today, every person uses technology in every aspect of their lives. In addition to being an advantage to make life easier, the use of technology also brings with it many problems caused by addiction (Andreassen, Pallesen & Griffiths, 2016). Dependency; It is a psychiatric disorder that causes undesirable behaviors in the individual when the effect of the factor that is continuous, repeated, increases in dose and harms the social and personal world of the individual, disrupts the functions of the individual (Yalçın Irmak & Erdoğan, 2016). With the spread of technology, technology addiction, which is a behavioral addiction, has also entered the literature. Game, internet, social media, smartphone addiction can be counted among technology addictions (Doğan, 2013).

This study was conducted to understand the effects of children's exposure to digital technologies on their cognitive, social, and emotional development, and to help make informed decisions about how to use these technologies. Raising awareness about technology use and addiction in children is becoming increasingly important for parents and educators. When the literature was examined, a limited number of studies were reached in which children's attitudes and behaviors towards digital technologies were examined. It is thought that this study will make an important contribution to the literature.

Method

This study was investigated by descriptive compilation (scanning) method, which is one of the qualitative research methods. The data collected using the content analysis technique, which is one of the qualitative research techniques, were analyzed and some inferences were made (Çelebi, 2023). In order to reach the studies related to the field in the world, Turkey and the TRNC, they are in the form of ERIC, TÜBİTAK, ULAKBİM and Google academic, respectively. In addition to these researches, university libraries were visited and the books and theses found there were researched.

Results and Interpretation

In this part of the research, findings and comments are included

Table 1: Effects of Using Digital Technologies in Children

Positive Effects	Use of Technology in terms of education:	When used correctly and limitedly, it is beneficial for access to educational materials and learning processes.
	Creativity and Problem Solving	Apps and games can help children develop their creativity and increase their problem-solving skills.
Negative Effects	Physical Health:	Prolonged exposure to screens can lead to eye strain, sleep disturbances, and obesity.
	Psychological Health:	Addiction can cause psychological problems such as depression, anxiety, and low self-esteem.
	Academic Performance:	Excessive use of technology can make it difficult to focus on lessons and reduce academic achievement.

When the table is examined, it is seen that digital technologies have a great contribution to the education of children. Educational apps, interactive learning materials, and online lessons make it easier for children to access information and make the learning process more enjoyable. Especially during the pandemic period, thanks to distance education platforms, children did not fall behind in their education and were able to follow their lessons online.

Digital technologies have both positive and negative effects on children. In addition to advantages such as educational benefits, access to information, social connections and the encouragement of creativity, disadvantages such as health problems, social isolation, security risks, decreased academic performance and distraction should not be ignored.

Table 2: Ways to Protect Children from the Harms of Digital Technologies

Prevention and Intervention Methods	Parental Control & Guidance	It is important to set certain deadlines for the use of technology and to follow these limits.
	Modeling	Parents should also limit their own use of technology by being good role models for their children.
Education and Awareness-Raising:	Information	To inform children about both the benefits and harms of technology use and to teach them to use it consciously.
	Alternative Activities	Engaging children with alternative activities such as physical activities, reading, art and sports.
Professional Support:	Expert Assistance	If the symptoms of addiction are severe, it may be necessary to seek professional help from a psychologist or pedagogue.

In the table, information that can help children use digital technologies in a safe and healthy way is presented. To prevent children from becoming addicted to digital technologies**,** physical activities should be encouraged. Outdoor activities and sports activities protect children's physical health while also allowing them to get away from the digital world. Developing hobbies and interests also offers alternatives for children to spend time outside of digital technologies.

Conclusions and Recommendations

Children and their families need to be aware of the use of technology. For this reason, school counselors should organize seminars for students and families on technology addiction in schools. It is necessary to carry out studies to improve the social skills of children. Families should make time to spend time together. The use of technology in children provides educational and developmental benefits when managed correctly. However, excessive and uncontrolled use leads to addiction and causes serious physical, psychological and social problems. Therefore, it is of great importance for parents and educators to be conscious and attentive, to guide children.

Research shows that long-term technology use can negatively affect children's cognitive and social development. Excessive screen time, especially for young children, leads to a decrease in language development and attention span.

High screen time in early childhood can lead to a decline in children's problem-solving abilities and academic achievement.

Excessive screen use can increase the risk of obesity in children. Lack of movement and unhealthy snack consumption trigger this situation.

Staring at a screen for long periods of time can lead to eye strain, headaches, and sleep disturbances. Blue light exposure reduces sleep quality by suppressing melatonin production.

Long-term screen use leads to a decrease in children's social skills, distraction, and even psychological problems such as depression and anxiety.

Studies have shown that the use of social media has negative effects on self-esteem and self-perception among young people. It is seen that these negative effects mostly affect themselves and their immediate environment.

Correct and balanced use of technology can have positive effects on education. Educational games and apps can support children's learning processes and provide them with a variety of skills Parental guidance and supervision and the use of technology help children become responsible and conscious individuals. Because every family's needs may be different, these recommendations can be tailored to your own lifestyle and the needs of your children.

Having regular conversations with children about the use of digital technology makes it easier for them to share the problems they face. It is important to actively observe what children are doing online, what sites they are visiting, and who they are communicating with in order to detect potential dangers early. Parents should demonstrate positive digital behaviors to show their children how to use digital technologies correctly and safely . Limiting screen time and choosing appropriate content is a good example for children. It's also helpful to increase the number of quality time spent without technology by planning family activities.Therefore, parents and educators should provide guidance and take necessary precautions to ensure that children use digital technologies in a balanced and conscious manner. This will ensure that children make the most of the opportunities offered by the digital world while also being protected from potential harm.

Developing digital literacy skills enables children to use the internet and technology more safely and effectively. This means that in the daily routines of the same children, a balance must be maintained between the use of technology and other activities.

Parents should keep a close eye on their children's use of technology and provide guidance.

Preferring educational and age-appropriate content helps children use technology more efficiently. Active participation in children's use of technology should be encouraged. This will allow children to not only become consumers, but also to be creative and productive.

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REDUCING THE LEARNING DISPARITY: IMPLEMENTING EQUITABLE ONLINE AND DIGITAL LEARNING

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ABSTRACT:
The emergence of pandemics and epidemics have brought attention to the urgent need for substitute forms of high-quality education, prompting the National Education Policy 2020 to support the use of technology to solve new issues. The article explores the necessity of using technology to close the digital gap and provide high-quality education. Key initiatives from NEP-2020 are covered, including improvements in digital infrastructure, online teaching platform and tool improvement, and online education pilot studies. The article additionally takes a look at mass media and virtual labs as means of tackling the digital gap and creating and disseminating content.
Keywords: Online education, digital education, National Education Policy 2020, digital divide, online assessments, blended learning.

Introduction:
During a time of extraordinary global challenges and rapid technology advancement, education is seeing a radical evolution toward online and digital platforms. The recent rise in pandemics and epidemics has highlighted the urgent need for high-quality alternate forms of instruction in situations when traditional, in-person approaches are impractical. The National Education Policy 2020 has acknowledged the need to take advantage of technology's benefits while also being aware of its possible drawbacks and hazards in response to these changing conditions.

Implementing well planned pilot studies to investigate the advantages of online and digital education while addressing any associated obstacles is essential to the NEP-2020's vision. In order to address the current and future demands of providing high-quality education to everyone, this approach highlights the significance of maximizing and expanding current digital platforms and ICT-based educational initiatives.

However, closing the digital gap is necessary before the potential advantages of digital and online learning can be fully realized. Ensuring fair access to technology for educational purposes is made possible in large part by initiatives like the Digital India campaign and the availability of reasonably priced computing devices. Furthermore, in order to effectively use technology in education, educators must receive thorough training and development to give them the tools they need to lead engaging online learning environments.

Additionally, the transition to online assessments brings with it special difficulties, such as the requirement to modify assessment procedures to fit the digital setting and deal with problems like network outages and academic integrity. Additionally, some disciplines have intrinsic limits in the online learning environment, such science practical and performing arts, therefore creative solutions are needed to get around these challenges.

Recognizing the value of combining online learning with experiential and activity-based learning strategies is crucial for tackling these issues. As a result, the possible drawbacks of merely screen-based teaching are avoided and a comprehensive educational experience that includes social, emotional, and psychomotor aspects of learning is guaranteed.

Significance of online and digital education:
The use of online and digital technologies has already become necessary due to the globalization of education. In order to maintain the educational system, the COVID-19 Pandemic has made it necessary the institutions must switch to an online teaching model. Developed nations were prepared to handle this issue. Developing nations, however, put a lot of effort into meeting this criterion. In this crucial era, online and digital technologies have emerged as education's saviour. Online and Digital technologies help students acquire skills including problem-solving, thinking structure construction, and process comprehension—all of which are necessary for professional performance. Digital tools and educational resources contribute to enhancing the classroom environment and enhancing the teaching-learning process. If digital technology is used in the classroom, kids may become more interested in what they are studying. As today's youth are largely habituated to using electronic devices, integrating them into education will surely help to spark their curiosity and increase their engagement levels. Students have an interesting learning experience when technology is incorporated into the classroom, which keeps them focused and engaged in the material. The use of computers, projectors, and other state-of-the-art technology in the

classroom has the potential to make learning engaging and enjoyable for students. By assigning assignments that use digital resources, oral presentations, and group projects, teachers can make their students' education more dynamic and interesting. of the learning process and take a more proactive approach.

NEP-2020: Online and Digital Education Recommendations:
The terms "online" and "digital" education relate to the remote presentation of instructional materials, learning experiences, and educational content via digital devices and the internet. With the use of digital devices like laptops, tablets, or smartphones, students may access course materials, communicate with peers and teachers, and finish schoolwork regardless of where they are in the world.

Courses, programs, and degrees that are offered fully or partially online via learning management systems (LMS), online forums, or virtual classrooms are commonly referred to as online education. It includes a range of modalities, such as recorded video lectures, interactive multimedia modules, discussion boards, live-streamed lectures, and online tests.

On the other hand, a wider range of instructional strategies that make use of digital technologies to improve the teaching and learning process are included in digital education. This includes enhancing traditional classroom instruction, enabling tailored learning experiences, and encouraging active student engagement through the use of digital tools, applications, and resources. In addition to typical online courses, blended learning methods that include digital resources into in-person instruction are also included in the category of digital education.

This Policy suggests the following major efforts in light of the rise of digital technologies and the growing significance of using technology for teaching and learning at all levels, from kindergarten to twelve to higher education.

Pilot studies for online education:
Pilot programs are essential testing grounds for assessing how well digital technologies can be incorporated into teaching methods.

Appropriate agencies, such as the NETF, CIET, NIOS, IGNOU, IITs, NITs, etc. will be identified to conduct a series of pilot studies, in parallel, to evaluate the benefits of integrating education with online education while mitigating the downsides and also to study related areas, such as, student device addiction, most preferred formats of e-content, etc. The results of these pilot studies will be publicly communicated and used for continuous improvement.

National Education on Technology Forum (NETF):
Pilot projects to evaluate the effects of different online education initiatives on diverse educational settings and populations can be led by the NETF. For instance, the NETF and academic institutions might work together to carry out pilot research on how well online learning platforms can help students from a range of socioeconomic backgrounds achieve better learning results.

Central Institute of Education Technology (CIET):
CIET, as a premier institution specializing in educational technology, can conduct pilot studies to evaluate innovative approaches to online education delivery and instructional design. Example: CIET may conduct a pilot study to compare the efficacy of different instructional formats, such as video lectures, interactive simulations, and gamified learning modules, in engaging students and enhancing learning outcomes.

National Institute of Open Schooling (NIOS):
The effectiveness of online learning resources and support services for students participating in open schooling programs can be evaluated through pilot studies that NIOS, a leader in open and distance learning, can carry out.
For instance, NIOS might carry out pilot research to assess the effects of offering online mentoring support and virtual tutoring sessions to students enrolled in distance education courses.

Indira Gandhi National Open University (IGNOU):
Being the biggest open university in the world, IGNOU is able to carry out pilot programs to investigate novel approaches to using technology to improve higher education's inclusivity and accessibility.
For instance, in collaboration with industry stakeholders, IGNOU may carry out a pilot study to see whether it would be feasible to offer entirely online degree programs that offer flexible learning options.

Institutions of Higher Learning in India (IITs) and National Institutes of Technology (NITs): Pilot studies can be carried out to assess the efficacy of integrating digital technologies into STEM (Science, Technology, Engineering, and Mathematics) education at IITs and NITs, which are well-known for their proficiency in technology and engineering education.

As an illustration, IITs and NITs may work together to carry out a pilot study on the application of virtual laboratories and simulation software to improve engineering students' hands-on learning opportunities.

Constant Communication and Improvement:
The outcomes of these pilot studies have to be made available to all relevant parties, such as legislators, educators, parents, and students, in order to promote openness and responsibility in the execution of online learning programs. For instance: To help with decision-making, research findings from pilot projects could be shared via policy briefings, webinars, public forums, and publications.

3.**2. Digital infrastructure**: There is a need to invest in creation of open, interoperable, evolvable, public digital infrastructure in the education sector that can be used by multiple platforms and point solutions, to solve for India's scale, diversity, complexity and device penetration. This will ensure that the technology-based solutions do not become outdated with the rapid advances in technology.

Building a solid foundation to facilitate the integration of technology in the education sector requires investing in digital infrastructure. Below is an elaboration on digital infrastructure accompanied by illustrations:

Internet connectivity:
Internet connectivity is necessary in order to participate in digital learning activities and access online educational resources.

Example: Government programs to build up broadband infrastructure in rural and distant areas, like India's Bharat Net project, are meant to give underprivileged populations access to high-speed internet connectivity so that teachers and students can take advantage of online learning opportunities.

Network Infrastructure:
The hardware and software elements that provide communication and data transfer over digital networks are collectively referred to as network infrastructure. For instance, to accommodate growing bandwidth demands, educational institutions may decide to upgrade its network infrastructure, which includes servers, routers, and switches.

Learning Management Systems (LMS): LMSs are centralized platforms that facilitate communication between educators and students, manage learning resources, and provide online courses.

For instance, using open-source LMS systems like Moodle or Canvas enables educational establishments to design scalable, adaptable digital learning environments that satisfy a range of student demands and preferences.

Content Management systems (CMS).
Teachers can produce, arrange, and disseminate digital learning materials, such as interactive simulations, multimedia resources, and textbooks, with the use of content management systems (CMS). As an illustration, the development of open and interoperable content management systems (CMS) like Drupal or WordPress enables educators to work together to generate and distribute instructional content across many platforms and devices, guaranteeing flexibility and accessibility in digital learning settings.

Cloud Computing Services: These services offer processing, storage, and online access to digital resources at a reasonable price and with scalability.

For instance, educational institutions can host virtual classrooms, store and manage educational data, and enable collaborative online learning for teachers and students by utilizing cloud-based platforms like Microsoft Azure or Google Workspace for Education.

Interoperability with Open Standards:
A commitment to open standards and compatible technology guarantees interoperability and a smooth transition across various digital platforms and solutions. As an illustration by supporting the sharing and reuse of educational

content, adopting open educational resource (OER) standards like Creative Commons licenses enables educators to work together and modify resources to fit their unique teaching needs and environments.

Measures for Cybersecurity: Securing sensitive educational data requires the use of strong cybersecurity measures. Protecting digital infrastructure from cyber threats and securing sensitive educational data require the implementation of strong cybersecurity measures.

For instance, putting in place firewalls, encryption methods, and authentication systems can reduce the possibility of data breaches and illegal access to educational materials and systems.

Policymakers and educational institutions can make informed decisions and use digital technologies to improve the quality, accessibility, and inclusivity of education for all learners by working with relevant agencies to conduct pilot studies and effectively disseminating the results.

Online teaching platform and tools: The relevant e-learning platforms, such SWAYAM and DIKSHA, will be expanded to give teachers a well-organized, intuitive suite of helpful tools for tracking students' progress. As the current pandemic has demonstrated, two-way video and two-way audio interfaces are essential tools for conducting online classes. A dynamic ecosystem that encourages continuous improvement and improves the calibre and accessibility of digital learning resources for students throughout India can be established by educational stakeholders by building a strong digital repository, encouraging a culture of content creation and innovation, and guaranteeing transparent feedback mechanisms.

Content creation, digital repository, and dissemination:
An easily navigable public rating system for user-submitted evaluations of the efficacy and quality of the content will be integrated into a digital repository that will house coursework, learning games and simulations, augmented reality, and virtual reality. Student-appropriate tools, such as apps that gamify Indian art and culture and are available in several languages with easy-to-follow operating instructions, will be developed for enjoyable, hands-on learning. There will be a dependable fallback method for giving pupils access to electronic content. Here is a thorough analysis complete with examples:

Development of Digital Repositories:
To house a vast array of educational materials, including course materials, learning games, simulations, augmented reality (AR), and virtual reality (VR) resources, a single digital repository will be established.

For instance, the repository might be designed to resemble sites like the Open Educational Resources (OER) Commons or the National Digital Library of India (NDLI), giving teachers access to a wide range of excellent teaching resources.

Content Creation:
Teachers and content producers will have the tools necessary to create engaging and creative learning materials in a variety of disciplines and media, accommodating a wide range of learning preferences and styles.

For instance, educators can be given access to tools like Canva or Adobe Creative Cloud to help them generate visually appealing infographics, presentations, and interactive multimedia content for online learning modules.

Virtual reality and augmented reality:
Technologies like virtual reality (VR) and augmented reality (AR) will be used to build immersive learning environments that mimic real-world situations.

For instance, using programs like Google Expeditions or Merge Cube, students may engage with 3D models, conduct virtual experiments, and explore virtual landscapes. This helps them better understand difficult concepts in science and history classes.

Addressing the digital divide:
Since a sizable portion of the populace currently lacks accessibility to digital media, broadcasts and telecasts will make full use of the mass media already in place, including radio, television, and community radio. These educational programs will be offered in multiple languages around the clock to accommodate the diverse demands of the student body. There will be a particular emphasis on and requirement for content in all Indian languages; digital content must, to the greatest extent feasible, reach educators and learners in the medium of instruction.

TV Broadcasts:
Television stations devoted to education can air instructional programming, reaching TV-owning homes in both urban and rural regions.

Example: Specific time slots can be set aside for the transmission of educational programs covering a range of subjects and grade levels by educational channels such as Doordarshan's DD National and DD Bharati.

Radio Transmissions:
Particularly in rural areas, radio broadcasts offer an affordable and easily accessible way to reach underprivileged and isolated groups with educational content.

Example: In order to create and broadcast educational programming that are specific to the needs and interests of the local community, community radio stations might work with educational institutions and organizations.

Virtual Labs:
Students can carry out hands-on learning activities from a distance with the help of virtual labs, which provide interactive environments and simulations that simulate actual lab investigations.

Virtual lab modules covering physics, chemistry, biology, and engineering are just a few examples of the subjects that can be included in e-learning platforms like DIKSHA, SWAYAM, and SWAYAMPRABHA. These courses may incorporate data analysis tools, virtual experiments, and simulations to give students an immersive education.

We will consider and refine the concept of providing appropriate digital devices—such as tablets with pre-loaded content—to teachers and students studying the Sustainable Development Goals.

Training and incentives for teachers:
Teachers will receive in-depth instruction in learner-centric pedagogy as well as how to use online teaching platforms and tools to create excellent online material on their own. The importance of the teacher in encouraging students to actively engage with the material and with one another will be emphasized. Online tests and evaluations: The development and implementation of assessment frameworks incorporating competency design, portfolio design, rubric design, standardized assessments, and assessment analytics will be carried out by appropriate entities, including the proposed National Assessment Centre or PARAKH, School Boards, NTA, and other identified bodies. Research will be conducted to test novel approaches to assessment that make use of educational technologies and emphasize 21st century capabilities.

Blended models of learning:
Blended learning is the term given to the educational practice of combining digital learning tools with more traditional classroom face to face teaching. In a true blended learning environment, both the student and the teacher should be physically located in the same space.

Blended learning models provide a well-rounded approach that leverages the advantages of both traditional in-person training and digital learning components. Following are some important blended learning models that work well.

Acknowledgment of Face-to-Face Learning:
Blended learning recognizes the importance of in-person communication and involvement between peers and teachers.

Example: Although digital resources offer convenience and a vast array of materials, in-person training facilitates social connection, prompt feedback, and individualized support—all crucial components of comprehensive learning experiences.

Finding Efficient Models:
We will identify and modify a number of successful blended learning models to meet the. unique demands of various subjects, grade levels, and learning contexts. Example: Various strategies are provided by models like the Station Rotation, Flex Model, and Flipped Classroom.

Customized Education:
Personalized learning experiences that take into account each student's learning preferences, pace, and style are made possible by blended learning.

Example: Students can interact with digital content at their own pace while still receiving targeted interventions and support from teachers during in-person interactions thanks to adaptive learning platforms and differentiated instruction.

Resource Optimization: By utilizing digital tools and resources to supplement and improve traditional classroom instruction, blended learning maximizes the use of educational resources. Example: To reinforce important ideas, encourage active learning, and offer chances for independent research and discovery, educators might select and include multimedia materials, interactive simulations, and online tests into their classes.

While promoting digital learning and education, the importance of face-to-face in-person learning is fully recognized. Accordingly, different effective models of blended learning will be identified for appropriate replication for different subjects.

Continuous Improvement and Evaluation: To guarantee efficacy and alignment with educational goals and objectives, blended learning models will be continuously assessed and improved. For instance, in order to pinpoint areas that need development and make well-informed decisions regarding instructional design and delivery, educators can gather input from parents, students, and colleagues, evaluate learning results, and examine data from digital learning platforms.

Laying down standards:
Standards for content, technology, and pedagogy for online and digital teaching and learning will be established by NETF and other relevant entities in tandem with the development of research on online and digital education. These criteria will be useful in developing policies for e-learning that States, Boards, schools, school complexes, HEIs, and other entities can use.

Challenges:
Despite the enormous advantages of online and digital teaching and learning, there are a number of challenges to be addressed in the transition, particularly with regard to equitable access. Access to internet resources is hampered by socioeconomic inequality, insufficient infrastructure in some areas to deliver digital education efficiently, insufficient digital literacy among students and teachers, the digital divide has a disproportionately negative impact on underprivileged populations, exacerbating educational disparities.

Socio-economic disparities hindering access to online resources:
Socio-economic disparities encompass a wide range of factors including income levels, access to technology, and educational opportunities. Families from lower socio-economic backgrounds may not have the financial means to afford internet connectivity, computers, or other necessary devices for accessing online resources. Limited access to high-speed internet services in rural or remote areas further exacerbates the disparity, as even if devices are available, the cost of internet services may be prohibitive. Additionally, families facing economic challenges may prioritize basic needs over investing in technology or educational resources, further widening the gap in access to online education.

Lack of infrastructure in certain regions for effective digital education delivery: Inadequate infrastructure, particularly in rural or underserved areas, poses a significant barrier to effective digital education delivery. These regions may lack reliable electricity supply, which is essential for powering devices and internet connectivity. Furthermore, the absence of sufficient infrastructure such as broadband connectivity and network infrastructure impedes the seamless delivery of online learning content. Educational institutions in these areas may struggle to provide the necessary technological infrastructure and support to facilitate digital education, limiting opportunities for students to engage in online learning.

Inadequate digital literacy among learners and educators:
Digital literacy refers to the ability to use digital technologies effectively and responsibly to access, evaluate, and communicate information. Many learners, particularly those from older generations or disadvantaged backgrounds, may lack the necessary digital literacy skills to navigate online learning platforms, access online resources, or engage in digital communication. Similarly, educators may face challenges in adapting to digital teaching methods and incorporating technology into their instructional practices, especially if they have limited training or experience in using digital tools. Without adequate digital literacy skills, both learners and educators may struggle to fully benefit from the opportunities presented by online education, leading to disparities in learning outcomes.

Conclusion

In summary, developing standards, investing in infrastructure, providing teacher training, and implementing inclusive pedagogical approaches are all important components of the complex strategy needed to fully realize the potential of online and digital education. Establishing standards for pedagogy, technology, and content offers the groundwork for quality control and uniformity in online teaching-learning experiences, as was said in the extended material above. These standards offer guidance for curriculum creation, technology integration, and assessment methods, assisting stakeholders at all levels of the education system.

Furthermore, creative approaches including utilizing mass media, granting access to digital gadgets, and advocating for blended learning models are required to close the digital gap. Educational stakeholders embrace digital learning opportunities and acknowledge the value of in-person engagement.

In addition, enhancing access to e-learning platforms, creating virtual laboratories, and investing in digital infrastructure guarantee that all students, regardless of location or socioeconomic status, have fair access to high-quality education. Stakeholders can harness developing technology to improve teaching and learning outcomes and revise and adapt online education programs to meet changing requirements through cooperative efforts and ongoing evaluation.

We can essentially actualize the revolutionary promise of online and digital education by emphasizing learner-centric teaching, encouraging active student interaction, and cultivating a culture of creativity and collaboration. By working together, we can create a future in which every learner has the chance to prosper in a connected and dynamic world.

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THE PEDAGOGY OF EMPATHY AND ITS IMPACT AT AN ONLINE SCHOOL IN GREECE

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ABSTRACT
The suspension of schools during the academic year 2020-2021 due to the coronavirus outbreak necessitated establishing an "Online School" to meet the multifaceted needs of students with serious health problems. This paper addresses the creation of an online environment of safety and care in which vulnerable teachers delivered teaching applying the pedagogy of empathy, a holistic approach to develop the cognitive and emotional skills of vulnerable students. This research is qualitative with fifty teachers and fifteen students getting interviewed using open-ended interviews and the method of qualitative content analysis. The purpose of the study was to investigate the impact of empathy pedagogy on students' learning outcomes and highlight the factors that empowered students and teachers. According to the findings of the study, empathy pedagogy and particularly the cognitive, affective, communicative and sociocultural pedagogical components had a motivational effect on vulnerable students' academic achievements contributing to quality and inclusive education.
Keywords: Empathy, components of empathy, Online School, online learning, social-emotional development, vulnerable students and teachers, COVID-19 pandemic.

The Pedagogy of Empathy and its Impact at an Online School in Greece

1. Introduction

The contagious infection caused by the SARS-CoV-2 coronavirus dramatically changed all aspects of life causing serious repercussions worldwide, impacting economies, health sectors, and inexorably education systems (UNESCO 2020c). Many schools were ill-prepared for this situation that had never happened before (Eurydice Brief, 2022) and essentially did not have the knowledge which technologies and methodologies were the most suitable for teaching under these circumstances, in terms of effectiveness, security and accessibility (Cachia et al., 2021). The pandemic posed unparalleled challenges requiring teachers to adapt to online teaching (König et al., 2020), disrupting traditional teaching practices in physical settings changing at the same time the daily routines of students (Tzankova, et al., 2022) who participated in distance education (Buonsenso et al., 2021). Many of them started falling behind academically with the most vulnerable experiencing major setbacks paying inevitably the heaviest price (UNICEF, 2021). Schools implemented distance learning combining online and classroom-based teaching (Eurydice Brief, 2022) ensuring the temporary continuation of the educational process (Hodges et al., 2020). The ad hoc shift from face-to-face teaching to distance education enforced turning to distance learning platforms with insufficient technological equipment and difficulties accessing the internet (Bubb & Jones, 2020; Dimopoulos et al., 2021).

Greece, following the worldwide transition to emergency teaching (Hodges & Barbour, 2021), responded to the educational crisis recurring to a number of digital resources formerly developed through the Digital School Strategy, which focused on digital solutions for synchronous and asynchronous learning (OECD, 2020). Despite underfunding, lack of infrastructure and accessibility to online learning environments, insufficient teachers' training on the pedagogical utilization of computer technology (Anastasiades, 2022), teachers and students were finally supported. The need for abruptly implementing distance education forced teachers to deal with radical

changes in working, training as well as social and digital inequalities, which emergency distance education gave rise to (Jimoyiannis et al., 2020). Emphasis was put on ensuring equal access to distance education environments providing remote technological support to everyone involved in the educational process.

Under the specific educational, social and historical context, the Regional Directorate for Primary and Secondary Education of Attica (R.D.P.S.E.A.) ran the "Online School", which was an emergency remote teaching school (Hodges et al., 2020), in order to address the abrupt shift of delivering teaching to alternative distance learning modes and distance learning was the only available option for maintaining the quality of teaching and learning.. The idea emerged under the pandemic education crisis, which created the necessity to think outside the box in order to meet the vulnerable students' needs, who should continue attending school without disruption throughout the academic year 2020-21. Five hundred and fifty one (551) vulnerable teachers provided online instruction for one thousand ninety six (1096) vulnerable students, who belonged to groups of increased risk due to serious health problems. The aforementioned groups needed special medical treatment or regular hospital visits. Subsequently, their health condition was at serious risk through face-to-face teaching so their involvement in distance learning was deemed imperative. Hence, teaching was organized exclusively remotely through online classes for both Primary and Secondary Education students (Kosyvas, 2022a) originating from various school units in the area of responsibility of the Regional Directorate of Attica.

While the pandemic had been tightening its grip, the social isolation of students and teachers had detrimental effects on their mental health, the manifestation of negative emotions and change in their behavior (Brooks et al., 2020). In order to mitigate the psychological impact, in addition to supporting the students' learning progress, a holistic pedagogical approach was necessary with emotional empowerment and strengthening of mental resilience due to serious health problems in order to maintain physical and mental well-being (Hatzichristou et al., 2022; Masten & Motti-Stefanidi, 2020).

For the achievement of the aforementioned goals, various prevention and intervention programs have been designed to promote the social-emotional development of children and adolescents in the school context (Cojocaru, 2023; Malti et al., 2016; Mondi et al., 2021). One of the most appropriate educational programs has been recognized empathy, which is a key component of social and emotional empowerment and balanced development. It is a widely accepted view that empathy can be cultivated and enhanced through such approaches (Batson, 2009; Jones et al., 2019).

Although there is a growing body of research on the benefits of developing social and emotional skills on learning achievements (Carlson & Dobson, 2020; Preston & de Waal, 2002; Wilce & Fenigsen, 2016), research on applying the pedagogy of empathy during synchronous and asynchronous distance learning is limited. In particular, to the best of our knowledge, there is a complete absence of studies which focus on students with severe medical conditions who were taught by vulnerable teachers during the pandemic in online environments, which is the aim of this paper.

2. Empathy and its conceptualisation

Empathy researchers and theorists have pursued the essence of this concept for almost a century having numerous and definitions (Batson, 2009; Cuff et al., 2016; Howe, 2013). The term is used haphazardly referring to a kind of emotion sharing when something happens to someone else (Wondra & Ellsworth, 2015). Accounting for a subjective experience, empathy involves understanding of other people emotional state feeling similar feelings with them (Decety & Jackson, 2004), imagining how other people think and feel, sharing experiences, needs, and desires between individuals (Riess, 2017). Therefore, empathy is related to emotional identification, recognition of another person's thoughts, feelings, state and condition. Through these varied definitions, it becomes obvious that there is not a consensus but a complexity of relevant definitions on behalf of different scholars.

The ability, then, to put oneself in another person's shoes, to experience their situation, to understand as much as possible the deeper motives of their behavior and to see the world through the eyes of other people can be attributed in various ways, as an individual ability, a personal trait, a competence, a reaction to other people experiences, and as interpersonal behavior (Luis et al., 2023) thus having a multidimensional nature (Baldner & McGinley, 2014).

However, empathy should not be confused with sympathy. A person may empathize with another person's suffering, but not understand the emotions causing it. With empathy we aim to understand others, whereas with sympathy we participate in their emotional experience, such as when expressing pity for a misfortune (Clark, 2010).

In order for true empathy to be manifested, the majority of clinical and counselling psychologists consent that three distinct skills are required, i.e. (a) the ability to share the other person's feelings, (b) the ability to observe what another person is feeling, and (c) the intention to respond compassionately to that person's suffering, which is "socially beneficial" (Hatfield et al., 2009). With reference to the aforementioned skills, Decety & Svetlova, (2012) claim that being able to perceive, share and recognize others' affective condition fundamentally facilitates surviving effectively in the social world. Essentially, this group of socioemotional competences constitutes some of the most meaningful human interactions, e.g. bonding between mother and child (Batson, 2009). Empathy has attracted the research interest of many disciplines such as neurology, psychology, philosophy and psychotherapy (Stephan & Finlay, 1999; Wang et al., 2022) and contributes to developing successful interpersonal relationships (Coutinho, et al., 2014).

In addition, empathy is considered a basic dimension of Emotional Intelligence being one of its components (Goleman, 1995), who supports that it comprises four main constructs - self-awareness, and social awareness amongst them. Self-awareness has to do with someone's ability to identify one's emotions whereas social awareness describes the ability to understand and appropriately respond to other people's emotions (Fianko et al., 2020) implying that by knowing yourself, you can understand the feelings of others.

Most definitions of empathy, which is a multidimensional concept, encompass different features and sides (Kaźmierczak et al., 2013). In the existing literature, the most prevalent fundamental dimensions identified by researchers are four, i.e. cognitive, emotional, communicative and sociocultural.

Cognitive empathy is the ability to take another person's point of view, to recognize and understand their feelings and the way they think and react to life events (Eslinger, 1998; Hogan, 1969; Rankin et al., 2005). It refers to the understanding of one's thinking (Davis, 1983; Eisenberg & Strayer, 1987) and emphasizes the role of cognitive processing in understanding another person's emotional state (Hogan, 1969; Eisenberg & Strayer, 1987) but without being in a similar situation (Decety & Jackson, 2004).

Emotional empathy refers to experiencing the emotional state of another person. This implies the existence of emotional response, which is consistent with the other person's emotional state. The individual reproduces the same emotions with other individuals, shares them, and feels similar experiences (Rankin et al., 2005). Emotional empathy is fundamentally an affective phenomenon (Iacoboni, 2011; Mehrabian et al., 1972; Preston & de Waal, 2002).

Communicative empathy refers to the ability of an individual to show another person that they understand their emotional state and that they can communicate this to their interlocutor accurately and honestly (Xiao et al., 2016). The communicative dimension of empathy focuses on its human-centered aspect contributing to a deeper understanding of the other person.

Finally, there is *sociocultural empathy*. Social empathy is the ability to understand people and acquire knowledge about their life conditions, situations and social inequalities (Segal, 2011; Segal et al., 2017; Segal & Wagaman, 2017). Cultural empathy focuses on solidarity, respect for diversity and develops intercultural communication skills (Dyche & Zayas, 2001; Shimizu, 2000).

According to Smith (2006), the aforementioned dimensions illustrate the fact that empathy refers to two interrelated human abilities, i.e. the vicarious sharing of emotions (emotional empathy) and the mental perspective (cognitive empathy). As regards mutual empathy, Jordan (1986) claims that it concerns the affective and cognitive experience of understanding another person carrying with it some notion of motivation to understand another's meaning system from their frame of reference and ongoing interest in their inner world. Hartling (2020) argues that "mutual empathy is a two-way dynamic process that involves joining in relationships that allow people to know and respond to the feelings and thoughts of the other person; it is a sophisticated skill that clears a critical pathway toward greater clarity and knowledge in relationships".

The ability to empathize is an important factor of social and emotional development, affecting an individual's behavior toward others and the quality of relationships (McDonald & Messinger, 2011). Across development, empathy contributes to promoting the development of children's and adolescents' social-emotional functioning and hindering their aggression in school contexts (Malti et al., 2016). One's ability to empathize develops gradually during childhood and is presumably influenced by children's social environment (Goldberg, 2021).

For the aforementioned dimensions of empathy to be evoked in school contexts, research highlights the critical contribution of teacher empathy in promoting student learning and maximising academic performance. When students feel safe and welcome, they fully participate in the learning process implementing tasks and activities efficiently and willingly.

2.1 Teacher empathy: role and importance

Teacher empathy is an integral part of their role and an essential element of their professional development (Feshbach & Feshbach, 2009; Swan & Riley, 2015). It is associated with the effort to feel students' positive and negative emotions in order to recognize their needs and concerns and empathize with them (Tettegah & Anderson, 2007). Psychologist Carl Rogers (1969) was the first to highlight teachers' empathy pointing out its crucial importance for increasing learning significantly whilst changing students' perceptions of education.

In everyday teaching practices, empathy is closely related to teacher-student interpersonal interaction (Boyer, 2010; Rogers & Webb, 1991). Teachers construct students' attitudes and values, creating an environment for their holistic development. In fact, the ability to empathize with students is an essential part of effective teaching and learning and building productive relationships (Narinasamy & Hasmah, 2013; Nieto, 2006).

In addition, empathetic communication between teachers and students contributes to creating a supportive learning environment, in which teachers make their lessons engaging and improve learning outcomes (Bozkurt & Ozden, 2010; Cooper, 2004). It has also been argued that teacher empathy has a positive impact on peer relationships reducing violent behavior (Ikiz, 2009; Schutz & DeCuir, 2002). Teacher empathy is an important skill that fosters supporting learning environments for all students (Arghode, et al., 2013) while it is a vital factor for launching teacher-student rapport (Teich, 1992). It follows, then, that expressing a keen interest on students' emotional state establishing at the same time constructive teacher-student relationships constitutes an essential factor in classroom.

By promoting high-quality teacher-student interactions, teachers' empathy can be assumed to foster student development (Aldrup et al., 2021). Research studies have revealed that empathy is of fundamental importance in teachers and learners' development as far as ethical, communal, and educational issues are concerned (Arghode et al., 2013). Consequently, teacher's empathy overwhelmingly contributes to students' empowerment. When teachers respond to students' emotional, social and academic needs in a sensitive way, the quality of teacher-student interactions is definitely enhanced (Pianta & Hamre, 2009). Hence, empathy also facilitates the development of social competence fostering, additionally, high quality meaningful and deep relationships.

Teacher's empathy is mainly related to interpersonal, social and intercultural empathy. Interpersonal empathy refers to knowing the inner state of the student, their possible difficulties in lessons and the teacher's response with sensitivity (Batson, 2009). Teachers' social empathy refers to the ability to recognize and understand the needs and feelings of students in the social environment of classroom, to identify differences among students in the way they interact with each other, and to adapt teaching to these differences by providing appropriate support to students who need it. Social empathy is the teacher's ability to understand the family and social conditions of his students (Segal, 2011) and is closely linked to students' academic success. It provides a framework for more effective social policies that address disparities and support social and economic justice for all people (Segal & Wagaman, 2017). Intercultural empathy focuses on understanding and respecting diversity developing intercultural communication skills. It facilitates students to develop alternative perspectives, avert cultural conflicts aiming at tackling prejudices, stereotypes and bias (Malikiosis-Loizou, 2008; McAllister & Irvine, 2002).

Intercultural and social situations refer to additional pressure each student experiences, due to low socioeconomic status, cultural identity, or regular hospitalization owing to chronic health problems. The better teachers understand the various personal, social and cultural state of students, the more they empathize cognitively and emotionally with them leading to compassion. This is also called compassionate empathy, and involves realising that someone feels discomfort and proceed to alleviating actions (Dolan, et al., 2017). Presumably, this type of empathy presupposes recognizing someone's emotions and understanding them.

Teachers providing a positive learning environment through empathy can actually activate learner engagement and studies have shown that empathy increases learner confidence in contexts where education takes place (Zhang, 2022). Empathetic teachers facilitate learners to boost their motivation and self-efficacy (Cooper, 2004) augmenting their self-confidence. Teachers with high empathy take the time to get to know their students' specific problems, paying particular attention to students with medical issues as well as to refugee students without a good command of the host country's language, who may feel the fear of failure.

Empathic teachers practice 'active listening', show flexibility in the delivery of homework and help students reach their highest potential by encouraging and supporting them. They also maintain high standards of academic achievement for their students (Janusik, 2002) striving to remove potential barriers to learning by implementing inclusive practices and providing differentiated instruction.

The cognitive component of empathy is associated with teachers' efforts to inhibit students' low performance and undesirable student behaviors (Hamre & Pianta, 2005). Thus, positive teacher-learner rapport can trigger learners to engage more in classroom activities (Wang et al., 2021). Empathy and teacher-student relationships are associated with boosting learning and increasing student performance (Barile et al., 2012; Cornelius-White, 2007). When teachers devote time and energy to understand isolated or discouraged students supporting them to fully develop their personalities, they benefit these students by enhancing their resilience (Bouton, 2016; Kosyvas, 2022b; Roorda et al., 2017). In these cases, proper questioning and active listening will yield significant benefits for learners (Fontana et al., 2015). Among others, the review strategy and the inclusion of motivational interviews are recommended to enhance student participation in the educational process (Miller & Rollnick, 2012; Reinke et al., 2011).

Nonetheless, Osler (2020) argues that "while empathy is discussed almost exclusively in the context of face-to-face interaction, we can empathetically perceive other people and their experiences in certain online situations". Additionally, in their research, Hancock et al. (2008) noticed that "emotional contagion", i.e. spread of emotions amongst individuals is possible via computer mediated communication.

2.2 Teacher empathy in online learning

During the past two decades, there has been a significant increase in research into online learning environments, the challenge of emerging 'digital empathy' as well as the social and emotional interactions as digital technology is increasingly used in teaching and learning (Artino, 2012; Humphry & Hampden-Thompson, 2019). In particular, researches carried out highlighted the impact that social interaction in online settings has on learning outcomes (Mayer, 2005) as well as student satisfaction (Borup et al., 2012), which, definitely, constitute critical factors that foster learners' progress.

It is worth clarifying that according to Friesem (2016), digital empathy regards a set of cognitive, emotional, social skills and processes, which enable individuals to analyze and evaluate other people's internal state, recognize, understand, and predict another's thoughts and emotions (cognitive empathy), and feel what others feel (affective empathy) through communication mediated with digital technology. Hence, digital empathy refers to showing traditional empathic characteristics such as concern and care for others (Terry & Cain, 2016), expressed through the medium of computers. Being compassionate and reflective, then, via digital media intersects communication in societies nowadays. In educational contexts, the flourishing of digital technology has fostered social interaction taking place online through computers. This constitutes digital empathy a crucial literacy, which promotes teaching and learning in online environments thus, making it a state-of-the-art approach in education.

For effective online teaching building empathy at the same time, a fundamental principle is developing a clear understanding of the learners' needs and expectations while adapting the instruction to learners' skills and viewpoints (Fuller, 2012). This way online empathy proves to be a useful tool for the creation of a community, which facilitates a sense of belongingness for students. Intimate relationships lasting for a long time can occur in online communities and people can find support when suffering from illnesses (Rheingold 1993). When people interact constantly, the foundations for stronger communities can be established (Berardi et al., 2020). However, a factor affecting online communities is the existence of trust amongst people facilitating communities not only to survive but thrive as well (Feng et al., 2003). Hence, connecting online with others continuously promotes empathetic practices. In online learning environments nowadays, the crucial role of showing empathy becomes evident providing valuable insights for teachers as to how they can fruitfully demonstrate genuine empathy online to empower learners. Conversely, the absence of empathic attitude on behalf of teachers would create a significant gap in relationships constraining building deep interactions in this context.

Teaching in online classrooms establishes a specific form of communication between students and teachers. As such, students' interpersonal and emotional experiences influence their engagement in learning and achievement of cognitive outcomes (Hastie et al., 2007; Price et al., 2007). Many studies highlight the importance of teacher-student interaction to support learning as well as caring, counselling and supporting students (Bryde, 2001; Richardson, 2009). Moreover, research on emotions involved in online learning environments offers an insight into relationships in academic achievements (Borup et al., 2012). Asynchronous modes of online communication (e.g. e-mail, texting) are integrated into teaching and learning practices. Nevertheless, during the

pandemic, synchronous modes of communication have been also used and researchers have studied their specific benefits, potential and challenge (Humphry & Hampden-Thompson, 2019).

Empathy and a sense of belonging during distance education favorably affect the learning process promoting students' learning motivation (Holmberg, 2003). Digital empathy can relieve students of mental pain and boost their confidence (Howe, 2013). As teaching becomes online, stress levels of a number of students may increase and empathetic teachers feel this anxiety and deal with it with specific reactions, e.g. expressing satisfaction when students understand the lesson content. In fact, teachers can create a warm classroom environment by affirming the successes of all students in addition to allocating time to know each student on an individual level (Meyers et al., 2019), which is rewarding for the welfare and future of those students (Cartee, 2021).

Consequently, online instructors need to use strategies to humanize online courses identifying the most effective strategies which engage learners in meaningful learning so that teachers can bridge the physical distance between students and themselves (Singh, et al., 2021). It is the teachers' task to make intensive efforts to reduce the social distance developing trust and respect between learners and instructors in online educational settings. Undoubtedly, achieving an in-depth understanding of engaging strategies will facilitate educators not only to maximise learners' academic achievements and social connections, but to build empathy, adapt learning to students' specific needs, and boost student motivation (Martin et al., 2020).

Empathetic practices within a distance education context influence the learning process positively especially when students are addressed directly (Holmberg, 2003). Conversation and direct contact socialize students fostering positive relationships. A key principle for effective online instruction is when educators develop a realistic understanding of students' needs tailoring Curricula to student abilities. In online learning environments, students and teachers often co-determine the pace of learning. Hence, students tend to be autonomous, taking control of their own learning and seeking advice and guidance from the instructor or peers when concepts or instructions are unclear (Fuller, 2012).

Teacher empathy is an educational skill of vital importance and research has shown that social-emotional competencies can be taught, and that schools play a significant role in nurturing empathy (Durlak et al., 2011). With reference to the underlying rationale for empathy education, researchers and educators contend that schools constitute major settings where socialisation can take place (Silke et al., 2021). Presumably, the Online School of Attica can be considered as such as long as there were empathetic practices among vulnerable teachers and students.

Nonetheless, this skill has not been explored implementing distance learning during the COVID-19 pandemic in online classrooms where vulnerable teachers delivered learning to vulnerable students. Additionally, little research has been reported on the impact of online teaching and learning on empathy in Primary and Secondary Education whereas fostering empathetic practices has been studied mainly in university online programmes (Fuller, 2012). Therefore, the aim of this paper is to study teachers' digital empathy and its impact in an online learning environment.

3. The Study

This research presents qualitative findings and aims to investigate the experience of social subjects (Fraenkel et al., 2016; Kyriazi, 1998). The methodology is mixed and the qualitative methods used are: a) the semi-structured interview and b) qualitative content analysis (Creswell & Poth, 2016; Cohen et al., 2017; Bryman, 2017).

3.1 Purpose of the research

This study aims to shed light on the perceptions of vulnerable teachers and students through the impact of the pedagogy of empathy on the learning achievements and academic performance of vulnerable students as well as identify the causal factors which contributed to empowering them in the context of synchronous and asynchronous distance learning at the Online School of the R.D.P.S.E.A.

In addition, the ultimate goal was to describe the wide range of experiences through genuine empathy of the appointed teachers, who made a conscious effort to sense their students' emotional state. The latter coupled with the ability to imagine and understand what and how someone else might be thinking or feeling constitutes a strong argument for making the decision to appoint vulnerable teachers as teaching staff at the Online School.

3.2 The research questions

This research paper aspires to investigate the perceptions of vulnerable teachers and students of the impact of empathy pedagogy at the Online School while implementing distance education during the academic year 2020-21. In this vein, the research questions of the study were articulated as follows:

- *To what extent did the pedagogy of empathy contribute to students' learning achievements in the synchronous and asynchronous distance learning environment?*
- *Which components of the pedagogy of empathy contributed to the empowerment of teachers and students in online teaching and learning?*

3.3 Participants – Sampling

For the purposes of this study, a total sample of fifty (50) randomly chosen vulnerable teachers out of 551 appointed at this school, and a number of fifteen (15) vulnerable students participated in the research (Cohen et al., 2017). In order to document data and information two online meetings through Webex were implemented purposefully with the participation of both teachers and learners.

The main selection criteria of the sample were belonging in a vulnerable group, experience with distance learning, availability to participate when conducting the survey. Participants had been informed about the process and had consented participating in the study, which was performed anonymously, using pseudonyms owing to personal data privacy and protection.

3.4 Research tools and procedure

The semi-structured interview constitutes a widespread practice in qualitative research (Ruslin et al., 2022). It is an open-ended and flexible form of interview, which allows immediacy and interaction, ensures control of the process and guidance of the participants, encourages free expression of thoughts and leads to rich and authentic data (Creswell & Poth, 2016). For the needs of the research, two protocols were developed for teachers (a) and students (b) respectively with appropriately worded "open-ended" questions (Ruslin et al., 2022; Tasker & Cisneroz, 2019) as follows:

a. *How did you experience your involvement as a teacher in the Online School during the pandemic? Can you describe the relationships with your students in the context of distance education, both synchronous and asynchronous? How do you evaluate the learning outcomes and academic achievements of your students?*

b. *What is your opinion and feelings about the Online School? What were your emotions when communicating with your teachers and peers through the digital platforms? Did you do well in the lessons? Did you learn as much as you expected?*

The semi-structured teachers' interviews were conducted by the researchers on June 9, 2021 for Secondary Education and on June 23, 2021 for Primary Education through teleconferences. The students' interviews were carried out by their teachers during June 2021 recording the content of the teleconferences and then the researchers deciphered its content. The interviews were transcribed into texts forming the database of the study.

3.5 Analysis of the research findings

Qualitative content analysis is a basic method of coding, analyzing and interpreting spoken or written language (Creswell & Poth, 2016; Elo & Kyngas, 2008) and contributes to the focused recording, analysis and interpretation of participants' attitudes and perceptions (Kyriazi, 1998). A constant comparative method was used in the analysis, which facilitated identifying common themes, organizing them into categories with key concepts coded for each focus group, i.e. teachers and students, according to the research questions (Creswell & Poth, 2016; Fraenkel et al., 2016). Going through the transcribed texts thoroughly, teachers' and students' responses were grouped into two categories providing answers to the study.

4. Research findings

a) Empathy and its impact on students' learning achievements in the online distance learning environment

The role of empathy as a critical contributing factor in promoting learning and educational achievements has been identified in the existing literature (Jennings & Greenberg, 2009; Cooper, 2011; Fuller, 2012), a fact drawn from the following teachers' responds.

T 1 *"Empathy means to be able to understand how our students think and feel. Without empathy, we do not care about our students, their efforts to learn, their difficulties and their progress."*

T 2 *"There was an emotional connection with students. Our warm relationship had a positive effect on student learning and performance."*

T 4 *"The power of empathy that existed between us strengthened the students' desire for learning and motivated them to put greater effort to succeed."*

T 5 *"I felt frustrated when some students did not perform well. I gave them additional opportunities to overcome difficulties. As students realised that I cared about them, they responded more to the lesson content."*

The interest, support and empathy of the Online School teachers were important factors facilitating student learning. The main concern of the teachers was to support students and closely monitor the learning process. Educators believed that empathy can be used effectively to facilitate vulnerable students' learning process through the creation of a supportive digital environment. The frequent absence of some students from the Online School due to hospitalization affected their academic performance. Empathetic teachers organized remedial lessons for absent students or posted supplementary supporting activities paying special attention to enhance the efficiency of their teaching. The relationship of teacher empathy with high student academic achievement is recognized by students as well:

S 1 *"With her thoughtfulness and kindness, my teacher helped me learn the lesson content."*

S 2 *"Digital courses and our teachers supported us in every way, which made me improve and raise my grades."*

S 4 *"I had perfect relations with all the teachers. They greatly contributed to maximising my performance during the school year. The digital school gave me the strength to complete preparation for the National Panhellenic Examinations."*

The students' learning achievements were enhanced by the pedagogical dimensions of empathy. Their high academic achievements are mainly attributed to the compassion and empathy of the teachers towards their students. Many researchers argue that students with higher levels of empathy get outstanding grades (Mwangi et al., 2015; Kumi-Yeboah, 2020; Hammermeister et al., 2020). Teachers had to support their students in order to effectively promote autonomous learning and meet students' academic goals regulating their own emotions, however, setting personal and professional boundaries in order to avoid stress and burnout (Kosyvas, 2023).

b) Pedagogical dimensions of teacher empathy during online learning

The empathy observed in the synchronous and asynchronous online learning environment is multifaceted involving numerous dimensions, which, in fact, are intertwined with each other. Based on the research data we identify four components: *i) cognitive, ii) emotional, iii) communicative, iv) sociocultural.*

i) Cognitive empathy and adaptation to students' needs in distance learning

The Online School for vulnerable students contributed to avoiding the disruption of the teaching and learning process owing to the pandemic outbreak. The teachers planned and managed the learning with empathy, organized the digital environment, monitored the progress of the learning, gave feedback and assessed the students (Kosyvas, 2023). The teachers' main concern was to respond to each student's diverse needs, cognitive skills and abilities. During the online meetings, the teachers were engaged in in-depth discussions expressing their opinions as follows:

T 3 *"Under the difficult conditions of the pandemic, I had to provide effective solutions dealing with education inadequacies during the online courses."*

T 6 *"We communicated effectively with the students and that's what helped them get the knowledge easier. Using digital tools I supported their learning process as much as I could."*

T 7 *"I gave students striking teaching material with examples to arouse their interest designing tasks and activities suitable to their abilities."*

The Online School teachers were asked to cope with the responsibilities of a challenging and difficult role. They managed to establish a climate conducive to mutual understanding, collaboration and acceptance in the online classrooms. They also launched major teaching initiatives familiarizing students with the course content in a stimulating way and making appropriate adjustments to Curricula based on students' needs and abilities. In addition, an important characteristic of the teachers was their good mood, the appreciation they had for their students, their high expectations, support and encouragement. The students were aware of the fact that their teachers were approachable, but demanding to a certain extent due to their health condition.

T 8 *"During distance education I tried to communicate with students constantly. I was giving detailed and personalized feedback on students' work. My aim was to motivate students to work harder, improve and succeed."*

T 3 *"I had to additionally support vulnerable students, who had learning difficulties, designing extra activities online."*

T 9 *"I prepared the online courses according to the Curriculum but adapted it to students' own difficulties, way of learning and needs putting a "personal touch" for each student."*

Taking the aforementioned into consideration, it becomes obvious that the teachers showed high levels of empathy adapting teaching to each student's particular needs. They also identified their learning process and characteristics and proceeded to organizing individualized teaching to achieve each student's learning goals. Teachers intended to address vulnerable students' individual learning difficulties and meet their needs (Ramana, 2013). The interactions throughout the learning activities demonstrate teachers' supportive attitude and digital empathy to help vulnerable students with immediacy and efficiency.

T 10 *"In physical classrooms checking new concepts comprehension was considered important. It was even more significant in distance learning especially when vulnerable students did not understand specific concepts."*

Teachers regularly ensured students' understanding of concepts taught during the online courses by asking relevant questions in the context of alternative formative assessment, which was conducted through synchronous discussions. Teachers used alternative ways of assessing students in order to identify strengths and weaknesses and target content areas that needed additional emphasis and remedial teaching. The Online School students accepted the synchronous and asynchronous distance learning online classes with relief owing to their medical condition.

S 5 *"When I was absent, my teacher devoted time putting effort into safely attending lessons and get very good grades."*

S 6 *"In our digital classes, we got knowledge through problem-solving activities often while playing. I will attend next class without having knowledge gaps."*

S 8 *"The lessons were organized on the digital platforms. I posted online work regularly and when I had difficulties, the teachers always helped me."*

S 9 *"I completed the digital assignments and sent them to teachers. They knew what knowledge we needed asking us to watch video lessons and answer questions. They answered our questions during the online classes solving the most difficult exercises in class."*

The pedagogy of empathy had beneficial effects on the teaching and learning process (Cooper, 2011; Damianidou & Phtiaka, 2016; Gribble & Oliver, 1973). Students were eager to learn and responded positively to teachers' interest for communication and broadening their cognitive horizons. During distance education, teachers faced daunting tasks assuming the role of pedagogical consultant of the educational process as well as facilitator of the online learning experience. Empathetic teachers tried to understand the students' cognitive state interpreting their reactions in order to subsequently adapt the curriculum to the students' needs and abilities resulting in effective teaching practices, greater student engagement and success during the digital learning process.

ii) Emotional empathy and resilience

Teachers' emotional empathy and their ability to perceive the students' mental state (Preston & de Waal, 2002) created healthy emotional bonds being able to recognize and understand students' positive and negative emotions, expressing compassion for them thus responding appropriately to their needs.

The Online School ensured the continuation of education during the pandemic offering vulnerable students the opportunity to meet friends and new teachers online. Educators did not just limit themselves to the achievement of cognitive goals, but attempted to approach each student by observing their behavior particularities closely (Hamre & Pianta, 2005). They obtained the necessary pedagogical information from School Principals students and pupils attended before the pandemic. Accordingly, the parents informed teachers about the severity of their child's health condition and its evolution, their emotional state and potential difficulties.

T 3 *"We managed to feel as if we were in physical classrooms. Every digital online classroom embraced all students."*

T 12 *"We organized online meetings with psychologists for some children who needed to overcome difficulties with parents participating as well."*

T 13 *"I listened to the emotions each student was experiencing and recognized their different physical and mental state."*

The majority of teachers showed high empathy towards their vulnerable students by offering support ensuring the emotional well-being of those who were at risk due to serious illnesses. The teachers with the support of the Educational Coordinators and psychologists placed a strong emphasis on a holistic understanding of the needs of school communities. They laid the foundations for the development of a genuine pedagogical relationship by establishing a pleasant and constructive collaboration with students acknowledging their fears and sharing their concerns and worries. It proved that empathy training acted proactively and soothingly on negative mood and anxiety disorders. Empathetic teachers encouraged the acceptance of diversity and the development of solidarity, which became important virtues.

Teachers' pedagogical actions reduced the competitive spirit thus strengthening resilience, which is the ability to overcome and positively adapt to the adversities encountered in life (Sanderson & Brewer, 2017); this motivated learning and contributed to increased student performance (Janusik, 2002; Fontana et al., 2015). The Online School teachers and students showed remarkable resilience to personal problems and the threat of the novel coronavirus disease (Kosyvas, 2022b; Papazis et al., 2022) with teachers' encouragement being constant.

T 2 *"The students empowered me to be healthy and stay alive. I was asking my students not to give up"*

T 14 *"At the Online School I felt safe and this gave me strength to face difficulties during the pandemic."*

T 15 *"I think it's hard to empathize if you don't experience similar health issues to your students."*

Empathetic teachers were aware of their online students' emotional state creating a climate of safety, acceptance and trust. They believed that the impact of distance education was very significant on students; they commented on their moral debt for applying a pedagogy contributing to students' well-being. They were proud of their students' learning outcomes and their participation in a great educational endeavor.

T 7 *"I was absolutely satisfied with my pedagogical contribution, relationships with students and their emotional empowerment. It was a moral obligation and my own need to offer students as much as I could."*

T 3 *"The children acted as the judges of the teaching process but that was the real recognition of my ongoing efforts despite health problems."*

In their responds, the students emphasized the feeling of belonging to a group and strength of friendly bonds amongst them. An online learning environment was created in which students felt safe and expressed their feelings freely. Students and teachers strengthened their contact, developed relationships with each other creating an online learning community. Students recognized teachers' valuable help and psychological support in online lessons.

S 9 *"This year I had a unique experience at school. At first we were all strangers but very quickly we became a nice strong group."*

S 5 *"My teacher was warm and patient. When I was in the hospital I looked forward to meeting her and my classmates."*

S 2 *"There was compassion with our teachers We were motivated and supported by them and that helped me greatly increase my performance."*

Teachers' and students' ability for emotional empathy improved through training and practice, and contributed to the development of successful relationships amongst them as well as to the promotion of well-being.

The two-way pedagogical relationship which developed within an appropriate psychosocial framework contributed to creating a positive pedagogical climate and good interpersonal relationships. The emotional state students experienced during online classes was supportive and productive. There was support and empathy between members of the school community, which led to the climate of safety allowing for a sense of calm in the school in order to maximize students' concentration and confidence.

Students experienced a range of emotions while interacting with their teachers, from joy and excitement to anger and anxiety, which influenced their participation in lessons and their learning experiences. Often the acceptance of failure, and avoiding stigmatizing mistakes led to positive emotions. Manifestation of emotional empathy flourished as much in online learning environment as in face-to-face teaching. Both positive and negative emotions were evoked in students such as willingness to participate in online dialogue or reluctance of emotion sharing. The counselling role of the teacher was very important, as students were supported in every way to develop as individuals and were progressively led to emotional 'literacy' understanding others' emotions as well as their own.

In conclusion, teachers' and students' ability for emotional empathy was improved through training and practice contributing to the development of successful relationships amongst them and their well-being.

iii) Communicative empathy and students' online engagement

The communicative dimension of empathy is closely related to the other dimensions and has a crucial pedagogical importance for the development of students' potential, self-awareness and self-regulation. Communication, information exchange, interpersonal interaction and dialogue between the teacher and the student lead to mutual understanding. The use of social media and mobile phones in everyday life has changed the ways of interacting and communicating affecting the expression of empathy. With digital technology the ability to instantly share thoughts and feelings can take place within seconds. These changes are a challenge for distance education and have brought to the fore 'digital empathy', i.e. the concern and care for others mediated by digital media.

S 10 *"In this different school, I met new classmates and became online friends to communicate. I also had teachers who helped me not to fall behind in school."*

S 3 *"During the first online classes, communication was not easy. Sometimes we were slow to connect to Webex and e-class but soon this improved."*

In fact, the need to familiarize students with e-learning, low internet speed and the lack of electronic equipment are also confirmed by the literature review (Dimopoulos et al., 2021; Jimoyiannis et al., 2020). In cases of lack of equipment laptops were borrowed from students' home schools.

The teachers and students were involved in the Online School digital environment, each having specific health problems and having their own way of displaying empathy, (Humphry & Hampden-Thompson, 2019). The ability to communicate was a dynamic relationship that led to knowledge production and the success of synchronous online teaching. The pedagogical relationship was bidirectional and students co-constructed knowledge with the teachers' support. Digital technology contributed to the development of digital empathy between teachers and students. From the first online lessons, teachers tried to set clear rules for everyone in order to be able to collaborate onwards.

T 16 *"During the first Webex courses, I gave instructions on how to use the e-class platform, how to find the teaching material and how to post their assignments giving advice for the success of the online courses. From the introductory lesson, I encouraged students to communicate both with me and their peers. I planned weekly discussions on students' concerns and an atmosphere of trust and interpersonal communication quickly developed amongst us."*

T 6 *"Students were satisfied with distance education and welcomed communication via Webex and e-class. They liked working in small groups and the process of looking for the solution to various questions on their own."*

T 17 *"With empathy and genuine communication I care about students' needs. They know that I am there for them regularly interacting with students."*

Basic skills characterizing a teacher while counselling and guiding are active listening, honesty, friendliness and empathy (Hornby et al, 2003). The Online School empathetic teachers facilitated building trust with students early on in the online learning environment. Autonomy, responsibility and collaboration were achieved by the social presence of the shareholders and their reciprocal action (Durlak, 2015; Humphry & Hampden-Thompson, 2019).

Teachers reported that a vital component of empathy in promoting successful interpersonal interaction and learning was the increased frequency of communication with students. Organizing real-time, synchronous discussions enhanced empathy, deeper understanding of students' needs, and trust. This promoted learning through a variety of interactions with the teacher and the online learning community. Feedback was both individual and for the whole classroom. Providing feedback outside the classroom context proved of vital importance using text messages on mobile phones or social media.

T 18 *"I am in regular contact with students in online lessons and give personalized feedback, to each student on their work. Using WhatsApp or Viber on my mobile phone allows me to increase the speed of responding."*

T 19 *"The Online School teachers are available even beyond school timetable. Students and parents communicated by email and by phone whenever they felt it was necessary."*

As students studied during asynchronous learning phase, teachers found a variety of ways to keep in touch with them thus showing digital empathy. Teachers were eager to communicate with their students, using email and *e-class* platforms responding directly with text messages or social media platforms, a fact which promoted a deeper understanding of students' needs. The use of multiple channels of communication seemed essential to maintain student and teacher interest and motivation.

The online learning model improved student engagement making learning meaningful and active participation of all students in learning was a challenge for teachers. Despite the difficulties, the empathetic teachers aroused the vulnerable students' interest, created opportunities for action and managed to motivate them as much as possible in a digital environment of creative online learning. Interactive, communicative, experiential, exploratory and collaborative learning was a key concern for the majority of teachers.

T 7 *"There were difficulties in achieving meaningful participation of all students in the synchronous online learning. I tried to arouse the students' interest in a playful way so that they focused on the lesson. To prevent being passive, I posed questions or problems for collaborative exploration in small groups or as a whole class."*

T 8 *"Often I called students by name at regular intervals to answer questions or confirm their attendance, e.g. to make notes in the chat to ensure their active participation."*

T 20 *"Distance education led to innovative teaching practices, student participation in decision making and the development of a meaningful relationship with online students, which is as important as in face-to-face classroom teaching."*

T 21 *"While preparing the lesson I try to imagine how students will receive knowledge from either posted written texts or videos."*

Our observations show that the online learning model, both synchronous and asynchronous, contributed to students' cognitive development (Halverson & Graham, 2019). During synchronous discussions, students engaged in two-way interactive communication, while asynchronous interactions focused mainly on students' tasks, using mostly one-way communication with less interactive exchanges. In contrast to the first phase of distance education implementation in which the technological dimension of digital media and tools was prioritized, the online approaches adopted highlight the fundamental importance of their pedagogical utilization.

S 6 *"We all became friends and keep talking and communicating with each other. I realized that it is nice to work with friends."*

S 1 *"The lesson was easy to participate in. I liked cooperating with classmates and try finding the answer. The lessons had pictures, images and videos."*

S 7 *"We didn't have any arguments. There was respect and understanding. Teachers asked us to express our own opinion and make decisions together."*

S 4 *"Although communication took place through digital tools, teachers were always by my side talking even after the end of the lesson."*

As students were involved in decision making during the educational process, they had increased opportunities for active participation in the learning process, collaboration and the cultivation of empathy. The teachers' ability to reduce social distance by developing trust and respect between themselves and students was important in the online learning environment. Videoconferencing provided the opportunity for high social presence that benefited both the communicative and pedagogical experiences of students since participants could see each other in real time and hear each other's voices during synchronous communication (Kear, 2010; Humphry & Hampden-Thompson, 2019).

iv) Social and cultural empathy

Sociocultural empathy contributes to developing students' multiple perspectives, mitigating cultural conflicts and aims to break stereotypes and prejudices as well as enhance social cohesion (Garcia et al., 2012). The Online School empathetic teachers collaborated on a common basis through the platform on which the interactions with students took place. The learning activities were inclusive in nature and were based on factual situations from students' social environment being tightly connected to their everyday life.

T 1 *"I tried to understand each student and pay attention to their behavior, to know their chronic illnesses, to listen to their needs and support them in any way."*

T 6 *"Both students and teachers understand that life is not only happy moments, that pain and suffering is part of life. We were united by regular visits to hospitals, our health problems and our common desire to overcome them."*

T 5 *"I had students with serious medical conditions. Since I also belong to high-risk groups, I felt an urge to help them. We tried together and managed to stand up and stay safe during the pandemic."*

The approval of the Online School from the majority of vulnerable teachers was heartfelt mainly because it provided them with safety regarding their health under the pandemic conditions. The teachers regularly informed parents, who motivated their child to participate in online classes since they knew the school timetable. Teachers regularly communicated with vulnerable students' parents discussing issues of pedagogical support inasmuch as acquiring further Knowledge of students' characteristics was a prerequisite for effective teaching.

T 1 *"I got useful information from parents and School Principals the students had enrolled in the beginning of the school year. I also had the Educational Coordinator's support regarding pedagogical and scientific matters always participating in in-service training seminars."*

T 22 *"Trying to better understand the students' social background, I contacted their families identifying family problems in order to give proper advice."*

Parents, on the other hand, supported their children using technology and played an important role in monitoring learning at home based on the teacher's instructions. Above and beyond all, the parents' constant support was necessary for the majority of the children due to their serious health condition. The parents' active involvement in the online learning process changed family life and they were faced with new situations (Canning & Robinson, 2021; Carlson et al., 2020). Some expressed a lack of expertise on digital platforms and were unable to help their children. Others felt discouraged and frustrated at the misfortune of their child's vulnerability and their long, hopeless efforts. For most, the hope for improvement of chronic health problems was alive. The harmonious collaboration between teachers and parents was necessary for students' school progress and proved pivotal for their safety and mental health.

Students developed their own emotional and social empathy towards their peers for the health problems they had to cope with acknowledging their feelings.

S 6 *"I realised that there are other children as well having health problems. Communicating with them made me feel stronger."*

S 10 *"When I was in the hospital I missed my classmates. I was looking forward to meeting them again on the platform."*

S 8 *"The teachers were aware of our needs and personal health problems. They knew our weaknesses and gaps in lessons and helped us to cope with them."*

The acceptance of diversity by the students participating in the study had a positive impact on promoting intercultural understanding and inclusion in online classrooms. The lessons were enriched with the principles of intercultural education supporting students who experienced marginalisation and learning difficulties. Teachers adopted inclusive practices that helped students to express their cultural identity hence enabling culture interaction.

S 2 *"We continue to talk and communicate with new friends teaching them some words from my mother tongue and they really liked it."*

S 7 *"I became close friends with one of my online classmates and I like to get knowledge about customs and traditions of her country."*

S 8 *"I have refugee friends and have learned a lot about their culture. Fortunately, our teachers do not consider being different a problem treating everyone the same. Our classmates are kind and show respect for everyone's rights."*

In an inclusive digital environment offering equal opportunities in teaching and learning, online students developed cultural empathy and trust towards their culturally diverse peers. Students' existing knowledge and experiences were a source of learning and a challenge for improvement. Teachers developed a variety of pedagogical approaches, teaching methods and learning materials in order to successfully handle multicultural online classes. As modern societies are characterised by the coexistence of different ethnic, racial, linguistic, religious and other sociocultural groups, there is a strong need for mutual understanding and acceptance to overcome barriers that prevent all students from participating in learning. The development of cultural empathy may be the best hope for fulfilling these aspirations (Garcia et al., 2012; Malikiosi-Louizou, 2008; McAllister & Irvine, 2002), which constitutes a great challenge for empathetic teachers.

In conclusion, empathy of vulnerable teachers refers to their multidimensional ability to see the world from students' perspective, to understand and perceive their thoughts, feelings and experiences (Howe, 2013). According to what was reported, the teachers' degree of empathy regarding the four pedagogical components was considerable. Empathy was an important teachers' competence, which enabled fostering robust relationships with their vulnerable students. Empathy facilitated establishing a climate of emotional safety, concern, acceptance and trust in online classrooms, supporting learning, and developing student self-confidence. Thus, students developed the skills necessary for success both in school and life.

5. Discussion

The Online School of the R.D.P.S.E.A. was a collaborative distance education venture that did not consider vulnerable students marginalised leaving them on the sidelines of society. It was based on the combination of technical, digital, administrative and pedagogical support embracing both teachers and students (Kosyvas, 2023).

The disruptive period of the coronavirus pandemic has posed significant challenges to mental state and well-being of school communities, while the impact on vulnerable students has been more intense, overshadowing many aspects of their personal lives (Hatzichristou et al., 2022). The imposed strict restrictive measures affected people's lifestyles (Tran et al., 2020). In addition, school suspension and the lack of direct contact with friends and classmates caused stress to many students changing their behavior.

Contrary to the adverse effects of the existing situation, however, the Online School accomplished the aim of building strong connecting links and relationships amongst its educational community. The vulnerable teachers focused on emotional, cognitive and behavioral aspects of empathy aiming at maximizing the students' learning outcomes and academic performance. The Online School vulnerable students and teachers were able to form tight-knit, resilient online learning communities in which everyone was considered an equal member. The synchronous mode of communication positively influenced the sense of belongingness, the feeling of safety and self-protection, online collaboration, thus improving social skills. Although the serious illnesses of many students prevented regular contact with their peers, they were able to connect to the Online School learning communities and strengthen their skills of adaptation to difficulties. Consequently, resilient communities greatly alleviated the pressure imposed on these vulnerable students.

As far as students are concerned, it is worth mentioning that the majority of them stressed the importance of high-quality interpersonal relationships amongst the whole school community underlining the beneficial mutual empathy both with their teachers and their classmates. Moreover, students pointed out the effectiveness of distance learning and the subsequent impact of synchronous and asynchronous collaboration models. Last but not least, they identified the advantageous creation of a human network during the pandemic, which triggered their motivation resulting in improved learning outcomes.

Inevitably, the world pandemic era called for a sharper focus on providing quality distance education to ensure learning outcomes and school attendance, thus, supporting students in every possible way to develop cognitively. Online learning contributed to safeguarding the health of the vulnerable groups of teachers and students. Teachers regularly contacted students' parents discussing various pedagogical issues to support learners. Both vulnerable students and teachers had to deal with physical and psychological difficulties, requiring further support. The aforementioned circumstances, inexorably, were the starting point for the Online School adopting the pedagogy of empathy, which focuses on the compassion for social justice and humanistic approach in education (Freire, 2021). The latter apart from being student-centred is also human-centred as long as empathy was the main trait of the most effective teachers' and learners' relationships.

The students' emotional involvement was interrelated with the cognitive interactions (Hamre & Pianta, 2005) that took place during the implementation of distance learning at the Online School and is inextricably intertwined both with communicative and socio-emotional empathy. The teachers implemented their subject teaching objectives, encouraging the emotional involvement of the learners, strengthening self-confidence (Hatzichristou et al., 2022). Some activities were replaced with others that were better adapted to the social-emotional conditions of each online classroom and vulnerable students' particular needs.

One of the important findings of this research is that the degree of empathy of the Online School teachers towards their students was multidimensional, i.e. cognitive, emotional, communicative, sociocultural, contributing as key factors to teachers and students' empowerment. Participants' empathy influenced the effectiveness of online teaching and learning. The correlation between digital empathy and improved learning outcomes and high academic performance has been highlighted in research findings both for vulnerable and

non-vulnerable students as well (Artino & Jones, 2012; Fontana et al., 2015; Kumi-Yeboah, 2020; Zorza et al., 2013).

Empathy promoted the flourishing of teachers' close relationships with students due to health problems and medical issues through constant communication. Empathic teachers recognized students' emotional and mental state and with appropriate pedagogical actions supported them accordingly. Active listening and teacher encouragement were appreciated factors in supporting vulnerable students, digital interactions stimulating online participation (Hastie et al., 2007; 2010; Roorda et al., 2017; Testa, 2022).

During the pandemic, students lost insouciance, joyfulness, genuine communication and were deprived of dreams and hope. Online School educators placed particular emphasis on an all-inclusive understanding of online communities needs, enhancing students' social-emotional skills such as emotional empowerment, enhanced preparedness, self-esteem, self-awareness, and self-regulation rather than exclusively focusing on cognitive goals. Comparable findings have been reported in similar pedagogical approaches to developing social skills in children and adolescents from non-vulnerable groups (Carlson & Dobson, 2020; Hodges & Barbour, 2021; Scorgie, 2010; Wilce & Fenigsen, 2016).

In the context of empathy-based pedagogy, teachers really connected with students, sharing feelings and experiences in dealing with their health problems, thus leading to student resilience. The benefits of developing authentic relationships with students are also highlighted in the existing literature (Cranton, 2006; Stipek, 2006). Teachers acted as counsellors encouraging students, promoting knowledge acquisition, ensuring their psychological safety relieving them from personal fears and the worries of the coronavirus outbreak.

Empathy contributed to success of distance online learning at the Online School. It was the basis of interaction among the teaching and learning process fundamentally facilitating the vulnerable students' motivation for further learning. Empathy was beneficial on students' involvement in online learning affecting their academic performance. Empathetic teachers set not only cognitive but social-emotional goals as well, depending on students' grade, class and subject (Cojocaru, 2023; Hamre & Pianta, 2005; Jones et al., 2019), such as to establish a safe environment in online classes so that students are able to recognize, express and manage their emotions. Hence, empathy was attributed with creating a genuine empathic connection during the online learning process enhancing motivation for further engagement and commitment to learning being responsible for taking decisions. Definitely, it had a positive effect on students' engagement and success in digital learning maximising academic performance (Kosyvas, 2022b). At the same time, the students' resilience led to an increase in their commitment, which subsequently resulted in high academic achievements, since many students were admitted to university. Some studies link student resilience to increased academic achievements (Cooper, 2011; Fuller, 2012; Jennings & Greenberg, 2009; Meyers et al., 2019; Mwangi et al., 2015; Sarwar et al., 2010).

6. Concluding remarks

The Online School was an innovative and collaborative project, which provided a protective environment of mutual support ensuring the increase of equal opportunities and the full development of vulnerable students' abilities, putting into practice the inclusive vision of a quality and inclusive education. It became a digital school that was successfully crowned thanks to the hard work of all participants (Kosyvas, 2023). The research questions of the study lead to the following conclusions:

The first conclusion of this research is that the degree of empathy of the Online School vulnerable teachers towards their vulnerable students was high and the empathy pedagogy adopted had a positive impact on students' academic performance. Empathetic teachers, noting the extensive atrophy of social relationships, the deficit of genuine interpersonal relationships, and the internalization of fears and anxieties amplified during the pandemic, have made dramatic efforts to holistically understand the needs of vulnerable students. While at first, there was emotional distance amongst them, they were soon united through their shared participation in digital learning communities, although they had never met before, thus having the chance to make new online friends.

These communities formed resilient social cells that empowered members to connect with other participants fostering online collaboration, the sense of belonging and safety. They also acted as stable reference points for the development of trusting relationships and a source of support for teachers and students. The Online School had multiple and significant benefits for vulnerable students contributing to maintaining their emotional balance and their interest in the learning process, but also to establishing relationships of mutual understanding and respect to their classmates and especially with their teachers. The pedagogy of empathy implemented by vulnerable teachers was a transformative force in education satisfying their psychological needs, and improving their social and academic skills. It provided a solution to the existing risk of isolation and marginalization of

vulnerable students while reducing, at the same time, their families stress on their cognitive and social-emotional development. The teachers' empathy and understanding of their students' health problems maximised their school progress. Empathy-based pedagogy boosted students' resilience and positive emotions enhancing engagement in online learning increasing academic performance.

The second conclusion drawn from the discussion of the qualitative results of this study is that the holistic educational approach to the pedagogy of empathy during synchronous and asynchronous distance education led to multifaceted enhancement of empathy. Students improved their understanding of another's thoughts and feelings and developed collaborative attitudes. The results of this research converge with the theoretical framework of this paper thus confirming the four dimensions of empathy, which contributed to the empowerment of teachers and students.

Another important finding that is consistent with the sphere of interests of this research is that distance education gave students the opportunity to experience the pedagogical characteristic of empathy during school suspension. Teachers' genuine interest for their students and everyday interaction with them promoted personal affirmation during online learning. Teachers recognized the potential of digital tools and redefined the value of their pedagogical role in physical classrooms. The Online School managed to benefit students empowering them to overcome fear, build trust, boost collaboration, and genuine relationships and communication, undoubtedly, with the teachers' continuous support. Based on this finding, ultimately, aiming at improving the quality of classroom-based education, the issue of quality pedagogical relationships in traditional classrooms becomes of paramount importance for both students' academic success and their personal and social development. Hence, the establishment of strong pedagogical relationships is a prerequisite for the "normality" of the post-pandemic era.

7. Limitations of the research

This research reflects the views of a small sample of students, who enrolled at the Online School. Furthermore, there are no quantitative results that fully indicate the positive impact of empathy pedagogy on students' academic success. It is also essential to underline that the Online School was evaluated as a whole both in Primary and Secondary Education whereas these two educational levels differ in terms of many educational aspects. Based on these limitations, the results of this research are amenable to further scrutiny meaning that they are not suitable for generalizations to the wider teacher and student population. However, the aforementioned findings provide important indications and offer useful clues for future scientific research.

8. Suggestions

As far as students with serious illnesses are concerned, distance education highlighted the need to adopt appropriate supportive online teaching approaches as a response to possible future crises as well as blended learning programmes, i.e. a combination of face-to-face teaching and e-learning in conditions of "normality". In this light, the initiative to promote empathy needs to be fostered in Curricula. In addition to vulnerable pupils with health problems, 'home-schooled' pupils could be included in blended learning programmes. Similar cases include children with special needs and pupils with a refugee or migrant background that society must accept without any form of discrimination, while preserving social cohesion. Access to education to an ever wider range of pupils should be accompanied by the existence of additional supporting structures. In this sense, further research should be implemented to study the inclusive school of the future focusing on the quality of pedagogical relationships through the eyes and experiences of students.

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TO STUDY THE INTEGRATION OF QR CODES IN TEXTBOOKS & THE PERCEPTIONS OF THE INTEGRATION BY IN-SERVICE TEACHERS AT GOVERNMENT SCHOOLS IN ANANTAPUR DISTRICT OF ANDHRA PRADESH

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ABSTRACT
The advent of novel technologies has brought out innovative methods of instruction and acquisition of knowledge. An example of such an innovation is the Quick Response (QR) code. The incorporation of QR codes into cellphones holds significant potential as a valuable tool for schools. In the academic year 2018-2019, the Department of School Education in Andhra Pradesh introduced textbooks containing QR codes to students in classes VI-X for subjects including mathematics, physical science, and biology. This was the first time such textbooks were used in India. Contemporary textbooks now incorporate QR codes, which allow students to scan and access more information on specific subjects, experiments, concepts, and procedures within the scientific method. Students can utilize the codes to gain entry to digital resources, such as text, as well as multimedia content like interactive animations, photographs, and videos. The objective of this research study is to investigate the implementation of QR codes in the textbooks of government schools in the Anantapur district of Andhra Pradesh state, as well as to assess the opinions of the present teaching staff regarding this integration. Data was collected via a survey that employed a Likert scale consisting of five points. A random selection was made of twenty-five educators who are currently employed in public schools in Anantapur district to participate in the data collecting. Based on the primary findings, 64 percent of the teachers currently employed believed that utilizing QR codes was a straightforward and efficient method to improve learning. Furthermore, the majority of individuals expressed a positive attitude towards the QR codes, with eighty percent indicating their intention to utilize the application for work-related endeavors in the future. The research featured informative examples of how QR codes were integrated into the classroom. Textbooks equipped with QR codes enable students to engage in self-directed study at their convenience. The incorporation and improvement of existing instructional techniques, through the utilization of QR codes, introduced a fresh and stimulating aspect to the process of learning in the classroom.
Keywords: QR Code (Quick response), class room activities, energising Text books, integration.

Introduction

Information and Communication Technologies (ICTs) are those groups of tools that make it easier for humans to generate, access, evaluate, and share information. A diverse collection of technical tools and resources used for information generation, dissemination, handling, storing, and communication is also known as information and communication technologies, or ICTs. Although humans have always communicated and accessed information, the digital aspect of today's technology sets them apart. Both the development of new technologies and their integration into existing ones are dynamic processes. utilizing information and communication technology (ICTs). Innovations in schooling are now possible thanks to technological advancements. Among these advancements are the QR (Quick Response) codes. Smartphone integration with QR codes may be a highly useful teaching tool in the classroom (Mehendale et al., 2017).

Students in Andhra Pradesh classes now have access to cutting-edge resources provided by the government. The nation's first state to use a novel method of reading textbooks on smartphones is Andhra Pradesh. The AP government implemented this to improve students' abilities and help them plan their future in secondary education. Approximately 70 lakh books were given to kids all over the state this year. During the 2018-2019 academic year,

the Department of School Education in Andhra Pradesh provided pupils in grades VI to X with stimulating text books that included QR Codes for non-language topics like mathematics, physical sciences, and biological sciences. These upgraded textbooks will present students with various forms of digital content, such as text, graphics, and interactive animations. The standard content contains QR codes that are placed inside it, covering a range of subjects such as scientific experiments, language, and procedures (Srinivasu, Nookarapu., 2019).

First, educators and students should download the "Diksha app." They should thereafter use the QR codes on their textbooks to scan for YouTube directly. Students can readily obtain their textbook courses on YouTube. There are texts created by subject matter specialists that use simple analysis methods. With the help of seasoned teachers, about 2,000 people have signed up for the program (Srinivasu, Nookarapu., 2019).

QR Code-History

In comparison to their one-dimensional counterparts, QR codes can hold more data due to their two-dimensional nature and the fact that they may be read in both the vertical and horizontal planes. One such industrial standard that QR codes fall under is ISO/IEC 18004. Denso Wave, a Japanese corporation, was the first to come up with and patent them in 1994. This method allows for more data storage capacity than one-dimensional barcodes, which means a more sophisticated reader is required. The 1994 development and legal protection of Denso Wave's design and patent confirmed the importance of QR codes in barcode technology. According to QRcode.com, the origins of QR Code can be found in DENSO WAVE.

QR CODE STRUCTURE:

Among the many possible classifications for the QR Code symbol are: One way to find a QR code is to utilize the Finder Pattern (1). In order to determine the location, size, and angle of the QR Code, three position detecting patterns (Finder Patterns) are organized in the symbol's top left, top right, and lower left corners. The patterns can be easily identified in any orientation. Two separaters: The white, one-pixel-wide separators improve the Finder patches' detection by separating them from the real data. Pattern 3 of Timing: The timing patterns are organized in both horizontal and vertical directions. Really, they're not much bigger than a single QR Code module. The actual purpose of this pattern, which changes between white and black patterns, is to determine the center coordinate of every cell. The alignment pattern consists of three modules: a central dark module, a light module, and five dark 5x5 modules. To fix the distorted symbol, this pattern is actually used. Finding the center coordinate of the alignment pattern will allow you to correct the symbol's distortion (Ji and Ji (2014). Format Details (5): This 15-bit area adjacent to the separators will hold the data regarding the selected masking pattern and the QR code's error correction level. The Data Pattern is the most important part of the QR Code symbol, which is represented by data (6). Codwords, which are 8-bit segments, are used to hold data once it has been converted to a bit stream. Similar to the data section, the error correction section uses 8-bit codewords to hold error correction codes (7). The Eighth Remainder Bit: The Remainder Bits section contains empty bits when the data and error correction bits cannot be divided into 8-bit codewords without remainder (Banegaon et al., 2022 and DURAK et al., 2016).

Features of a QR Code:

Rapid reading: A QR code's finder pattern enables rapid scanning in any direction (3600). Encoding data with high capacity: QR codes can read control codes, numbers, alphabetic characters, kanji, and kana, among other types of data. It has 4,296 alphabetic letters, 7,089 numeric characters, and 1,817 kanji characters for storing information. Because they can communicate data in both the vertical and horizontal planes, QR codes are compact and need little space when stored. Because of their Japanese heritage, QR codes are able to encode Japanese characters well. Resistant to Dirt and Damage: Thanks to its error correcting capabilities, data can be easily recovered even if a QR code symbol is partially dirty or broken. Reference: Ali et al. (2017). By utilizing the structured add function, it is possible to divide a QR code into many data portions. However, it is possible to merge the data stored in several QR code symbols into a single data symbol. Correction for Distortion: A QR code sign can still be read when displayed on a distorted or curved surface. Al-Khalifa (2011) states that... Based on the work of Sharma (2013).

Types of QR Codes:

QR Code Model 1and Model 2	Micro QR Code	iQR Code	SQRC	Frame QR
				
[Feature] Model 1 is the original QR Code. The largest version of this code is 14 (73 x 73 modules), which is capable of storing up to 1,167 numerals. Model 2 is an improvement on Model 1 with the largest version being 40 (177 x 177 modules), which is capable of storing up to 7,089 numerals. Today, the term QR Code usually refers to this type.	[Feature] Only one orientation detecting pattern is required for this code, making it possible to print it in a smaller space than before. This code can be viable even if the width of its margin is 2 module-worth (QR Code requires a margin of 4 module-worth at least around it). The largest version of this code is M4 (17 x 17 modules), which can store up to 35 numerals.	[Feature] Code that can be generated with either square modules or rectangular ones. Can be printed as a turned-over code, black-and-white inversion code or dot pattern code (direct part marking). The maximum version can theoretically be 61 (422 x 422 modules), which can store about 40,000 numerals	[Feature] QR Code that has a reading restricting function. Can be used to store private information or manage a company's internal information) Its appearance is no different from the regular QR Code. > denso-wave.com	[Feature] FrameQR is a QR code with a “canvas area” that can be flexibly used. Since letters and images can be inserted inside the canvas area, FrameQR can be used for promotion, authenticity judgment, and other various uses. > denso-wave.com

Because of their versatility, QR codes have taken on many different formats to meet a range of purposes and applications. The following lists different categories of QR codes:

DENSO, the pioneering company behind the development of the QR code, revolutionized data encoding with its innovative technology. Its subsidiary, DENSO WAVE, has further specialized in advancing QR code technology and its diverse applications. From the creation of the original QR code to the development of specialized types like iQR codes, SQRCs, and Frame QR codes, DENSO and DENSO WAVE have consistently expanded the utility and versatility of QR codes. These advancements highlight the adaptability of QR code technology across various contexts, from secure data management and high-capacity information storage to creative promotional uses. Through continuous innovation, DENSO and DENSO WAVE have cemented their roles as leaders in the field, demonstrating the wide-ranging utility of QR codes in meeting the evolving needs of different industries.

The original QR code model, known as QR Code Model 1, was developed in 1994 and has been largely replaced by QR Code Model 2 due to its limited capacity and usage. Model 1 is capable of storing up to 1,167 numeric characters, making it less practical for modern use cases that require more storage space. On the other hand, QR Code Model 2 was introduced in 2000 and offers a significantly higher storage capacity of up to 7,089 numeric characters. This increased capacity has made Model 2 the most commonly used QR code today for various applications such as commercial advertising, business cards, and product labels (“use of QR codes in education”)

Micro QR Code

Micro QR codes are the smallest version of QR codes, offering over traditional QR codes. With only one orientation detecting pattern, Micro QR codes are simpler and easier to create than their larger counterparts. Additionally, they require a smaller margin of 2 modules compared to regular QR codes that need a minimum margin of 4 modules. This makes them perfect for situations where space is limited, such as on small products or packaging. Despite their diminutive size, Micro QR codes can store up to 35 numeric characters, providing ample room for storing information like product numbers or inventory IDs. Whether you're looking to save space or add a touch of elegance to your designs, Micro QR codes are an excellent choice for any application that requires a compact and discrete code (“use of QR codes in education”)

iQR Code

The iQR code stands out for its impressive flexibility and capacity, making it a versatile solution for modern data encoding needs. It can be generated with either square or rectangular modules, accommodating various design requirements and spatial constraints. Additionally, iQR codes support multiple print formats, including turned-over codes, black-and-white inversion, and dot patterns, allowing for innovative applications like direct part

marking. The maximum theoretical version of an iQR code is 61, with dimensions of 422 x 422 modules, capable of storing up to approximately 40,000 numeric characters. This high data capacity, combined with its adaptable design features, makes the iQR code particularly suitable for industries requiring large amounts of information in a compact, customizable format (“use of QR codes in education”)

SQRC

SQRC codes are a specialized type of QR code designed with a reading-restricting function, offering an additional layer of security. Despite their advanced capabilities, they maintain an appearance similar to regular QR codes, ensuring they can be seamlessly integrated into existing systems and applications. This feature makes SQRCs particularly useful for storing private information or managing internal company data, where confidentiality is paramount. By restricting who can access the encoded data, SQRC codes provide businesses and organizations with a secure method for handling sensitive information, enhancing both privacy and data protection ("use of QR codes in education").

Frame QR codes introduce a unique feature known as the "canvas area," which allows for flexible use beyond traditional data encoding. This innovative design enables the insertion of letters, images, and other visual elements within the QR code itself, making it a powerful tool for promotional activities and brand messaging. The canvas area can be creatively utilized for authenticity judgments, providing a visual verification method alongside the encoded data. This dual functionality makes Frame QR codes highly versatile, suitable for various applications where both information encoding and visual communication are important. By integrating promotional content and authenticity features within the same QR code, businesses can enhance their marketing efforts and ensure the integrity of their products or services (“use of QR codes in education”)

Literature review

There has been a lot of study on the topic of technology integration in the classroom, with QR codes being the main focus. Two-dimensional barcodes called quick response (QR) codes can improve education by connecting pupils to digital resources including movies, websites, and apps in an instant. Sondhi and Kumar (2022) reviewed the literature that dealt with questions like how textbooks used QR codes and how instructors felt about technology in the classroom.

Considering QR codes in the context of education requires a facilitatory perspective on QR technologies. It is more important to focus on the students and the instruction rather than QR codes, since mobile technologies cannot guarantee better learning on their own.

To fully harness the potential of mobile learning, it is essential to establish educationally significant learning environments and possibilities. The focus should not be on integrating mobile devices into education but on promoting a more learner-centered approach (Zhang et al., 2010).

Utilizing QR codes can be advantageous in a wide variety of educational contexts, including trail activities, outdoor or field activities, paper-based tasks, learner-generated content, and working teaching. Working instruction, student-created content, assignments based on paper, field trips, and trail exercises are the five main categories into which these methods fall (Rikala & Kankaanranta)

Through trail activities, students investigate their local communities and use what they find to complete tasks. These activities can be designed as study aids for individuals, group projects, or competitions. Students completed math puzzles, explored their neighbourhoods, and scanned codes at each location along a math trail that Law and So (2010) created. The students were interested in new approaches that were different from what they normally did, and this activity sparked their curiosity (Law & So, 2010).

Using QR codes in field or outdoor activities allows students to explore life science subjects like wild flora and animals. Along with identifying clues, these codes might provide further information on the habitats of different species. By incorporating cellphones and QR codes into biology field excursions, Lee et al. (2011) made it possible for students to explore and identify species at the research location. They shared the results of their study with their colleagues through various presentations, seminars, and social media platforms. Because the codes contain relevant information, students learn more effectively, and instructors may create individualized field study guides for each student. Another interesting idea is to combine digital learning resources with field trips by using QR code activities (Lee et al., 2011).

Students can use QR codes to access multimedia resources, such as audio files or video clips, and guide themselves through the self-assessment process while working on paper-based tasks. For instance, by scanning the QR code

on a worksheet, students can access a website with the answers, allowing them to track their progress in learning. Law and So (2010) demonstrated the usefulness and flexibility of QR codes in a listening exercise, highlighting their ability to provide accessible materials and aid students in self-evaluation. According to Law and So (2010), students favoured using QR codes and mobile devices for individual activities due to their convenience and speed.

Students can include learner-generated information into online reports and resources by using QR codes. Some of their other possible projects include creating interactive reading experiences, developing children's books, and recording their readings. This approach fosters student-centered learning by encouraging the development of interactive experiences and the dissemination of student-created material (Sharma, 2013).

Teachers engage in working teaching when they provide students specific directions and explanations on how to do homework. To achieve this goal, teachers can attach QR codes to art and engineering materials; students will be able to study on their own and the codes will show them how to utilize the tools (Sharma, 2013).

There is evidence from studies on QR codes' usage in the classroom that they can improve students' interest and performance in class (Callaghan, 2021). According to research, using QR codes in the classroom can increase student engagement by giving them access to multimedia and interactive content. This, in turn, can help them remember important ideas and learn at their own pace (Bhat & Alyahya, 2024) In addition, students can easily access supplemental materials and resources through the use of QR codes, which promote accessibility (Bhat & Alyahya, 2024).

There are a number of obstacles that must be overcome before QR codes may be effectively used in the classroom. Individually, educators may be wary of embracing new technology if they do not feel prepared, secure, or convinced of the advantages (National Center for Education Statistics, 2011). Similarly, institutional factors such as a focus on time-honored evaluation and teaching practices and a lack of available technological resources can impede the use of QR codes in the classroom (Alsalam, 1989).

Significance of the study

Learning how to think critically, interact effectively with others, and develop one's inner resources are all components of a well-rounded education in the modern world. The foundation of these abilities is in the hard sciences, mathematics, geography, and history; they are bolstered by expertise in the fields of media and technology, professional development, education, and new product development. Teachers have a responsibility to instill these skills in their students. Due to the novelty of the technology, there is a dearth of studies examining how students and their parents feel about the use of QR codes in the classroom. The current study aims to contribute to the existing body of knowledge by exploring the use of QR code integrated textbooks in group projects and instruction, as no prior research has examined teachers' viewpoints on this topic. The research hopes to fill a gap in our understanding of the role of 21st-century abilities in the classroom (Uçak & Usta, 2022).

Objective of the study

To investigate how in-service teachers in government schools in the Anantapur District of the state of Andhra Pradesh perceive the integration of QR codes in textbooks.

Methodology

Research design

One of the quantitative tools utilized in the investigation was the survey design. The steps involved in doing survey research include articulating the research topic, developing the survey, selecting a sample, collecting data, analyzing it, and finally, publishing the results while citing the appropriate literature. (Creswell, 2007.)

Study group

The study sample consisted of 25 in-service teachers employed in government high schools in the Anantapur district, selected using the cluster random selection approach.

Data Collection

The research on QR codes was used as a basis to build an anonymous Likert scale questionnaire with 12 items ranging from strongly agree/1 to strongly disagree/5. The questionnaire was based on previous studies by Gogova & Koceska (2014), Lee et al. (2011), and Shin et al. (2012). Although the majority of the Likert scale statements were collected from Rikala and Kankaanranta's (2012) study, a small number were sourced from Gogova and Koceska (2014), Shin et al. (2012), Rivers (2009), and Lee et al. (2002). In order to collect participant responses, we created a Google form and included these questions (Rikala et al., 2014).

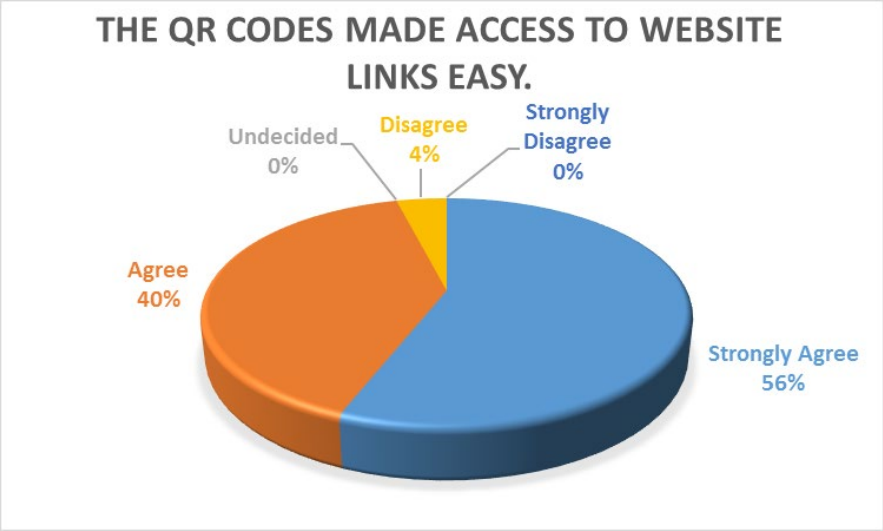
Results

The table displays information from an online survey of twenty-five respondents (n=25) on their experiences scanning QR codes to open links to websites and finish tasks. The scale is 1 to 5, where 1 is probably strong agreement and 5 is significant disagreement, or vice versa (the survey instrument would usually establish the precise scale interpretation). For every statement, the standard deviation (S.D.) and mean are shown in the table.

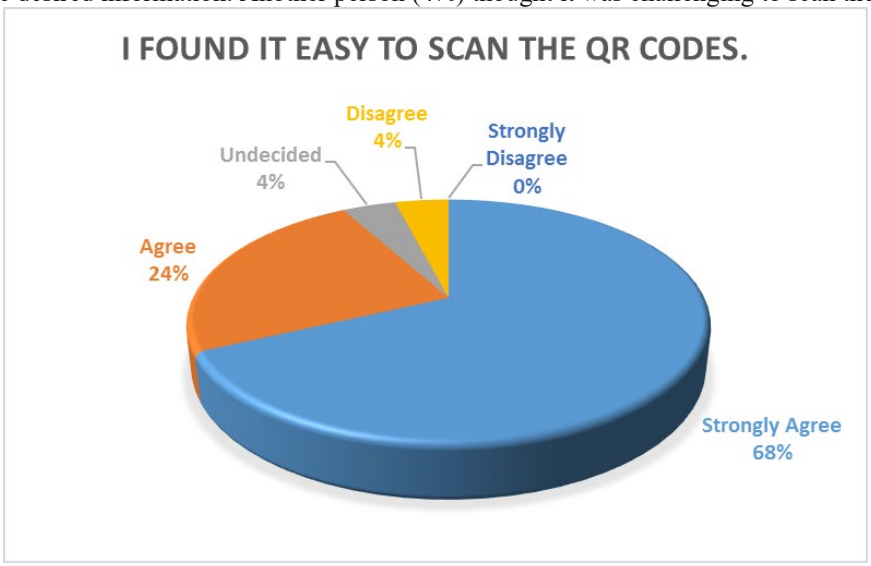
Table 01: mean scores and standard deviations of the QR code inventory questioner

S.NO	STATEMENT SCALE (1-5)	MEAN (n=25)	STADARD DEVIATION (S.D)
1	Access to website URLs was made simple by the QR Codes.	1.52	0.71
2	I had no trouble scanning the QR Codes.	1.44	0.76
3	I had no trouble picking up the skill of utilizing my mobile device to scan QR codes.	1.48	1.00
4	The QR code scanning speed was fast enough.	2.04	0.93
5	The usage of QR Codes was easy and convenient.	1.56	0.86
6	To do the exercises, I found it helpful to use the QR Codes outside of the classroom.	1.8	1.04
7	I finished the activities with the assistance of the information found in the QR Codes.	2.12	1.16
8	Using QR codes, one might obtain a wealth of helpful data.	2.08	1.15
9	I'd want to engage in QR activities once more.	1.72	0.97
10	plan to make use of QR Codes in the future.	1.44	1.04
11	In order to enhance in-class activities, I will push other educators to adopt QR Codes.	1.48	1.00
12	The QR Codes exercises should be incorporated into the curriculum that I teach.	1.48	0.82

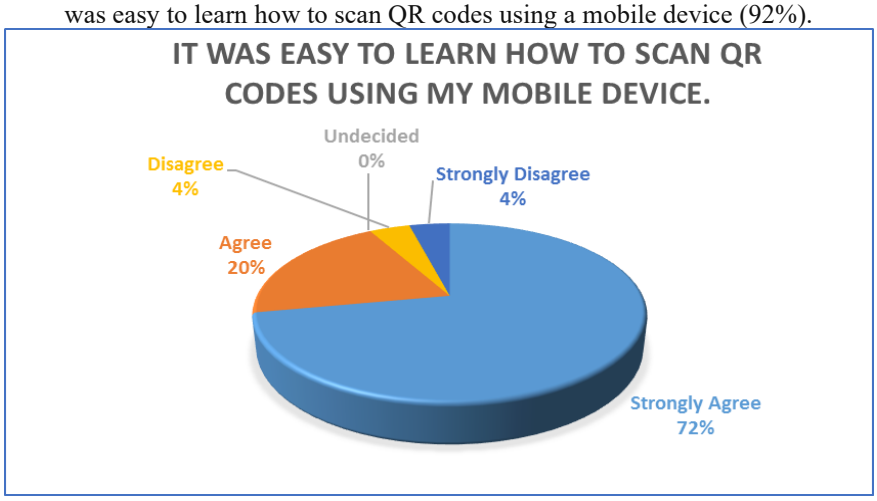
1. Of the twenty-four teachers surveyed, ninety-six claimed that QR codes made it easy to access website connections. Only four teachers disagreed, believing that they were difficult to link to.



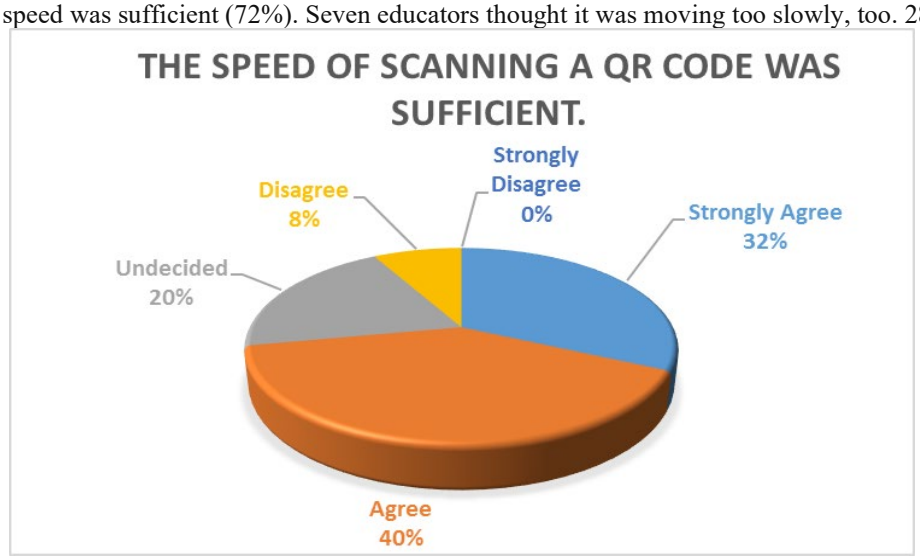
2. A total of twenty-three educators reported that using the reading program and scanning pages was simple. Nevertheless, despite the fact that scanning the code was simple, it occasionally required many scans in order to retrieve the desired information. Another person (4%) thought it was challenging to scan the QR code.



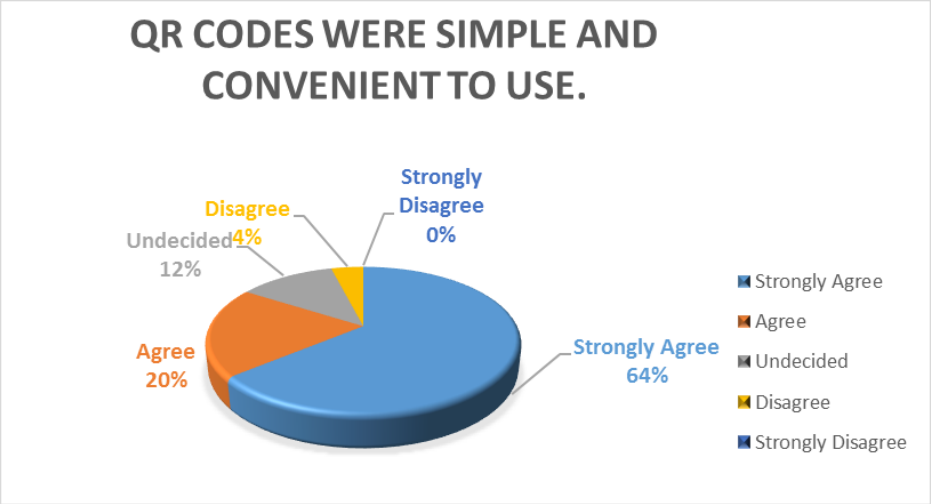
3. Two instructors thought it was very difficult to learn (8%), but twenty-three teachers said it was easy to learn how to scan QR codes using a mobile device (92%).



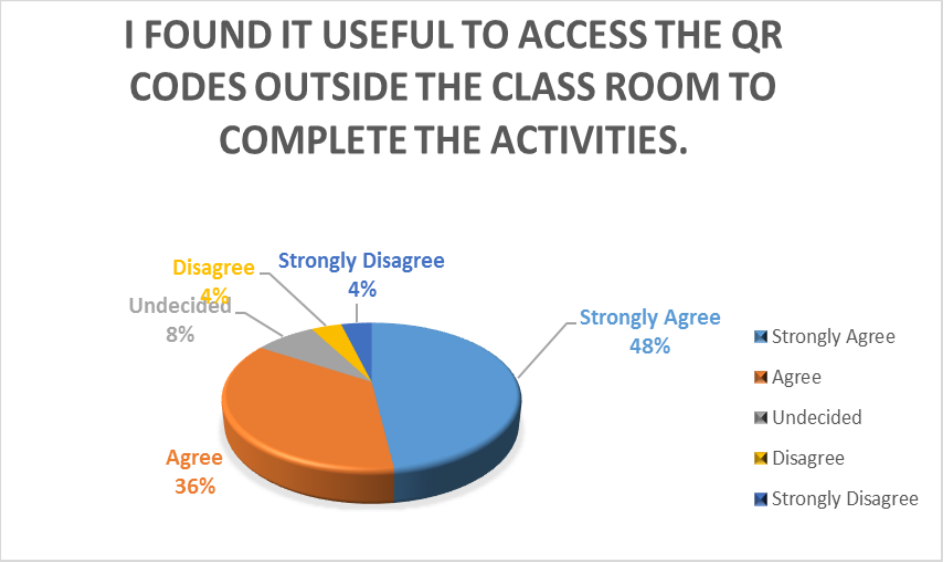
4. The majority of the schools are located in rural regions, thus 18 instructors concluded that a QR code's scanning speed was sufficient (72%). Seven educators thought it was moving too slowly, too. 28 percent.



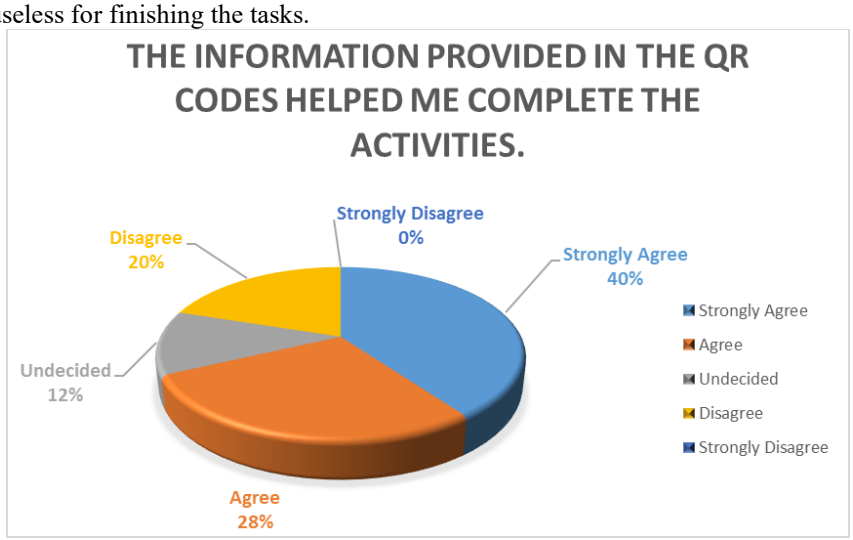
5. Twenty-one educators thought using QR codes was easy and convenient (84%). But according to four instructors (16%), using QR codes is not at all convenient.



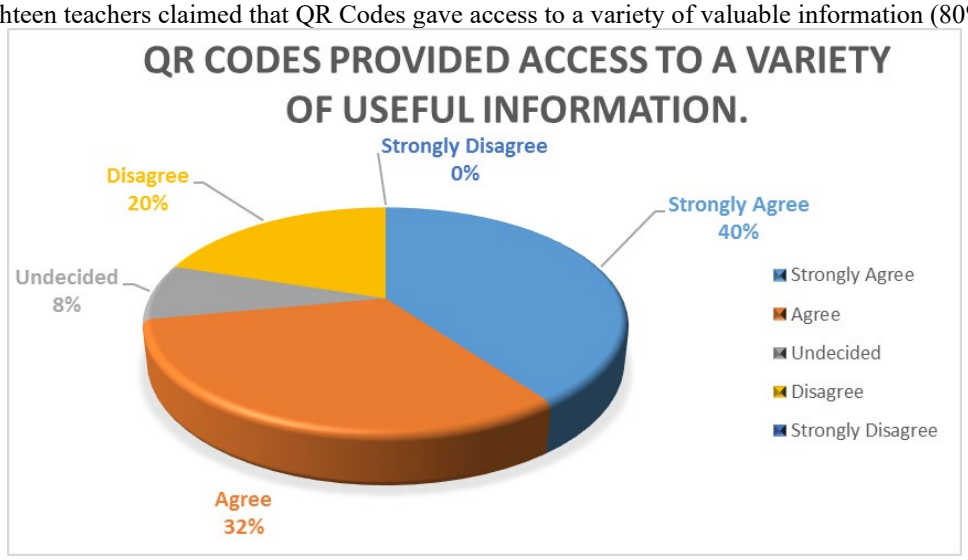
6. In order to finish the exercises, twenty-one teachers believed that QR codes might be accessed outside of the classroom. But four educators believed they are inaccessible (16%), according to 84% of respondents.



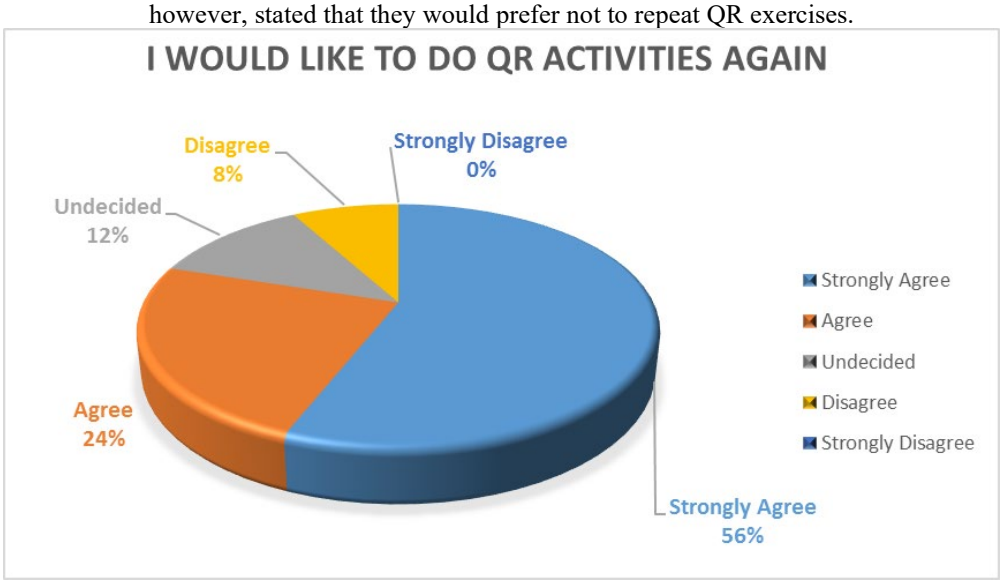
7. Twenty teachers discovered that eighty percent of them were able to finish the exercises with the aid of the information included in the QR Codes. However, 20% of the teachers said that the information contained in the QR Codes was useless for finishing the tasks.



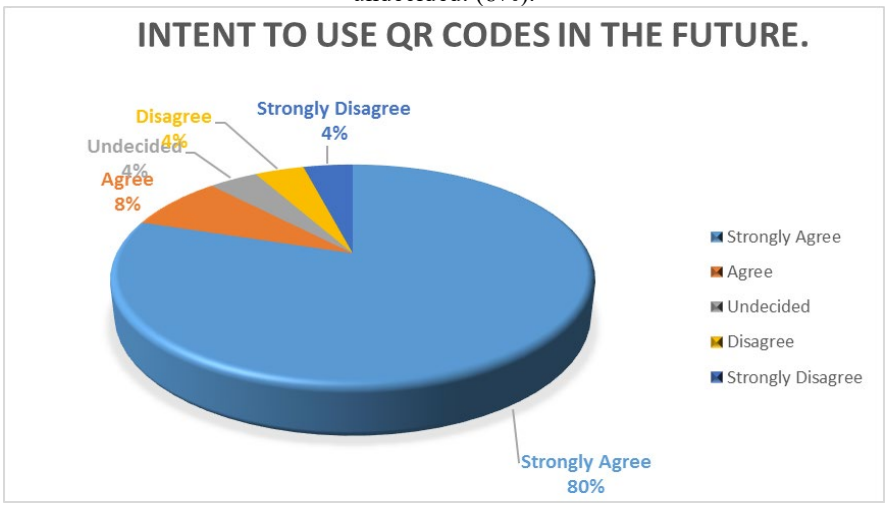
8. Seven instructors discovered that QR Codes did not offer access to a range of information (20%), whereas eighteen teachers claimed that QR Codes gave access to a variety of valuable information (80%).



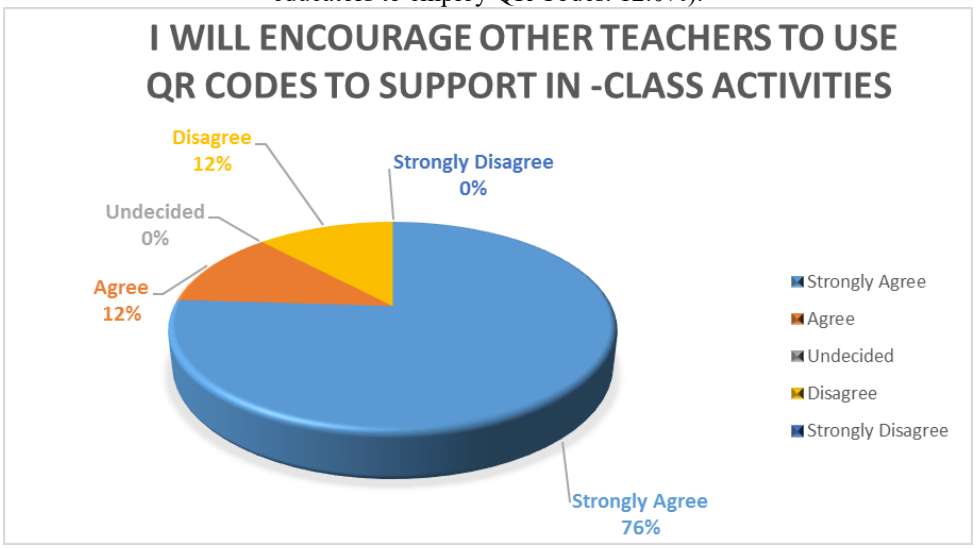
9. It was discovered by twenty teachers that they like doing QR activities again. 80% of instructors, however, stated that they would prefer not to repeat QR exercises.



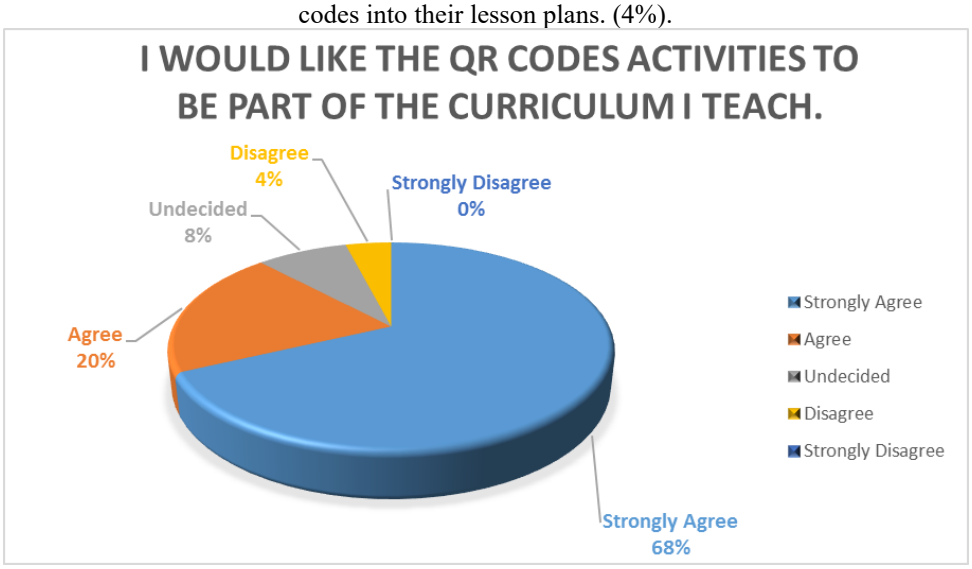
10. In the future, twenty-two educators said they planned to employ QR Codes. (88%). Two instructors discovered that they are not interested in using QR Codes in the future, and one teacher (4%), found to be undecided. (8%).



11. In order to enhance in-class activities, twenty-two educators said they would urge other educators to employ QR Codes. (88%). To promote in-class activities, three teachers, however, are unwilling to advise other educators to employ QR Codes. 12.0%).



12. Activities involving QR codes were discovered to be a component of the curriculum by twenty-two instructors. (88%). Additionally, two teachers (8%) are unsure. Nevertheless, one educator declined to use QR codes into their lesson plans. (4%).



Discussion

The purpose of the research was to learn how people felt about using QR codes in the classroom. The findings demonstrated that QR codes simplified the process of accessing website links, scanning them, and learning to scan them using mobile devices. Although there was a little greater variation in answers, the speed of scanning QR codes was adequate. Quick response (QR) codes were easy to use and provided a quick way to access resources outside of class to finish assignments. While the data contained in QR codes did aid in the completion of tasks, the answers varied considerably. (The UGD Academic Repository's The Use of QR Codes in Education, n.d.).

The participants were enthusiastic about the usage of QR codes, said they would use them again, and even encouraged other educators to do the same. They also wanted to use QR codes in their lessons, albeit their answers were all over the map. While replies varied, the survey did find that respondents generally wanted QR code exercises included in the curriculum. In sum, the results show that QR codes can help teachers improve their lessons and give students access to useful information. Nevertheless, the study also note that the outcomes might differ based on the particular setting and the extent to which participants agree. (Updated by Gradel and Edson, 2011).

Conclusion

Thanks to their capacity to retain and link comprehensive information to digital resources like webpages, movies, and multimedia content, QR codes—originally created for inventory tracking—have become a promising instructional tool. Educators can take use of these codes to enhance student engagement and accommodate a variety of learning styles by supplementing static learning materials with dynamic and interactive resources. Several advantages can be gained from textbooks that incorporate QR codes. These include creating more interactive learning environments, giving students faster access to supplemental materials, and offering resources that are specifically designed to meet the needs and skills of different students. In order to foster analytical thinking, problem-solving, and teamwork abilities, educators can use QR codes into their lesson plans to provide students with access to interactive simulations, multimedia presentations, quizzes, and more.

Problems with device compatibility, internet access, and QR code legibility arise while using QR codes in the classroom. To keep the gaps in digital literacy and access to resources from widening, it is essential that all students have equal access to digital resources. Teachers need enough chances for professional development and training to ensure they have the pedagogical competence and instructional design abilities necessary for QR integrated textbooks to be effective.

In sum, using quick response (QR) codes in textbooks is a great way to up the ante on classroom instruction. Maximizing the educational benefits of QR codes in varied educational environments would require addressing technological problems and offering full assistance for educators.

Limitations of the study

Technical constraints, insufficient teacher training and expertise, a lack of student participation and interaction, and insufficient funding are just a few of the factors that affect the study's ability to draw firm conclusions on how instructors are using QR integrated textbooks. Only 25 currently hired teachers from public schools in the Anantapur District of Andhra Pradesh would be included for the sample. Technological constraints, such as the accessibility of devices and the internet, may have affected the perspectives and experiences of the participants.

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UNDERGRADUATES' ATTITUDES TOWARDS THE USE OF E-LEARNING FOR LEARNING IN KWARA STATE, NIGERIA

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ABSTRACT
E-Learning, is significant mode of education, transforming the way human access and acquire knowledge, it equally facilitates learners' access to course materials and available resources through any internet-connected location. This study, therefore assessed students' attitudes towards e-learning espousing in Kwara State. The study also examined the influence of moderating variables of age and gender on attitude towards e-learning. The research design adopted is the descriptive research of survey. The sample for this study was 396 undergraduates in Kwara state. A researcher-designed structured questionnaire titled "Attitude Towards E-learning Scale" (ATES) was utilized to collect study data. The findings revealed that undergraduates in Kwara state have positive attitude towards e-learning. In addition, there was a noteworthy distinction in Kwara State undergraduates' attitudes on e-learning according to gender, but not according to age. The study's recommendations were based on the findings, which suggested that guidance counsellors provide gender-sensitive help by adjusting tactics and suggestions to accommodate the unique obstacles that male and female students have while embracing e-learning. It was also suggested that counsellors should offer age-appropriate advice, such as guiding younger students toward the development of efficient time management techniques and helping older students advance their technological proficiency. This will help newcomers adjust to the online learning environment by exposing them to techniques that will inspire them.
Keywords: Attitudes, E-learning, Espousing, Undergraduates

Introduction

E-learning is an online learning environment that makes use of digital technologies and resources. It can incorporate a range of multimedia components, including audio and video recordings, interactive tests, and more, and be either self-paced or instructor-led. E-learning is often used in educational institutions, corporate training programmes, and other settings where learners need to acquire new knowledge or skills (Liu & Yu, 2023). The manner that people access and gain knowledge is changing as a result of the growing popularity and significance of e-learning. Baruah (2018) asserts that e-learning makes education more accessible by allowing students to access course materials and other resources from any location with an internet connection. It removes geographical restrictions and gives students control over the times and locations of their education. Adult learners, working professionals, and people with varied schedules will find this very helpful.

According to Nganji (2018), e-learning is a crucial part of contemporary education since it provides flexibility, accessibility, and a customized learning environment. The pandemic's global trend to online learning and the need for ongoing skill improvement in a changing labor market have only served to highlight its significance. Since e-learning was used in higher education institutions, costs for students have decreased while teaching and learning quality has increased (Songkram, 2015). This demonstrates that students can use e-learning to save money and use their free time for other beneficial pursuits (Aparicio, Bacao & Oliveira, 2016). Another significant benefit of e-learning is flexibility, which allows students to attend classes at any time and from any location. Additionally, by employing a large amount of the interactive content that is readily available on the internet, e-learning accommodates a variety of learning styles (Songkram, Khlaisang, Puthaseranee & Likhitdamrongkiat, 2015). The need for web-based teaching and learning has increased due to the widespread availability of the internet and technology. Users of distance learning can become more flexible and work beyond location and time constraints in this ever-expanding environment. E-learning is defined in academic institutions as learning that occurs entirely or in part online (Gilbert, 2015).

Studying students' attitudes towards e-learning is crucial for several reasons, as it provides valuable insights that can inform educational practices and improve the effectiveness of online learning. Understanding students'

attitudes helps educators design e-learning experiences that align with students' preferences and motivations. According to Umar and Ko (2022) When learners approach e-learning with positivity, they are more likely to engage actively, stay motivated, and complete their coursework successfully. By gauging students' attitudes, instructors can tailor their e-learning materials and strategies to accommodate different learning styles and preferences. Some students may prefer video lectures, while others may prefer interactive quizzes or discussion forums.

Pupils' attitudes on e-learning are influenced by a variety of circumstances, including their perceptions of its benefits and drawbacks (Dhamija, 2016). Undoubtedly, having a flexible schedule is a huge benefit for students because it allows them to learn at any time and from any place as long as they have access to the internet or other devices that facilitate e-learning (Bertea, 2019). A study conducted by Al-Fraihat, Joy and Sinclair (2019) found that students perceived e-learning as a more flexible and convenient way of learning, allowing them to balance their academic pursuits with other commitments. Insufficient computer proficiency, tech anxiety, and hardware issues with computers can all contribute to students' negative attitudes about online learning. These issues can also include ineffective study techniques, low motivation, and an unwillingness to work independently (Smith et al., 2020, Govindasamy, 2015). The absence of in-person interactions between students and lecturers in online courses is another drawback. Prior research by Furlong, Sutherland, and Furlong (2015) and Ponzurick, France, Russo, and Cyril (2015) found that some students experienced emotions of loneliness and isolation while forced to look at a computer screen.

Pupils who are fortunate enough to own a laptop or personal computer avoid connecting it to the internet because doing so incurs additional costs that they cannot afford (Gautam & Tiwari, 2016). Low student attendance in online courses has also been caused by bad internet connectivity and expensive data plans (Eze et al., 2018; Oluebube, 2017). Because some families and students may not be able to afford basic necessities like food and clean water, let alone the pricey equipment and resources to support them for online study, low online class attendance has been connected to the high percentage of poverty in the nation (Oluebube, 2017). Eze et al. (2018) state that instructors' reluctance to help students acquire the knowledge and training necessary to maximize the effectiveness of the e-learning platform is another issue with e-learning. E-learning allows for the total absence of in-person contacts between students, instructors, and other students.

Research has indicated that e-learning can have a favorable impact on learners' insights (Gautam & Tiwari, 2016; Martínez-Caro, Cegarra-Navarro & Cepeda-Carrión, 2015; Chang, 2016). For instance, by using interactive video facilities for classroom activities, students might gain deeper understanding of the material (Gautam & Tiwari, 2016). This enables students to reply to online activities right away. Additionally, it has been shown that e-learning platforms improved teacher-student contact. Learning Content Management System (LCMS), Learning Support System (LSS), Learning Design System (LDS), and Learning Management System (LMS) are the four common types of e-learning systems that have been developed (Islam, Beer & Slack, 2015). To name a few, some professors employ Zoom, YouTube, and WhatsApp to enhance teaching and learning. Universities have made investments in ICT infrastructures, management information systems, email access, and library information services as a result of an increase in student enrollment (National Universities Commission, 2023). It is challenging for many institutions to envision and carry out these projects locally. This could be the result of problems with students' negative attitudes toward technology, issues with bandwidth, and the difficulty of an unpredictable electrical supply (Sasu, 2023).

According to Kisanga (2016), attitude is a brain or mental state of readiness that has been organized by experience and that directs or dynamically affects how a person reacts to things and circumstances. An easy and effective technique to explain recurring patterns in behavior is through attitude. Attitude condenses, clarifies, and forecasts behavior (Varshney, 2016). As long as there is an internet connection or other electronic devices that allow e-learning, students can learn regardless of their location, which is an advantage, according to Dhamija (2016). Students viewed e-learning as a more flexible and convenient method of learning since it allowed them to manage their academic endeavors with other responsibilities, according to a study by Al-Fraihat, Joy, and Sinclair (2019).

Teachers, counselors, and other stakeholders are becoming increasingly concerned about the way students feel about online learning (Bertea, 2019). This general concern stems from a number of factors, including the current unstable power supply, unpredictable internet access and connectivity, adaption problems, and the high cost of e-learning devices like laptops and smartphones. In Nigeria, an unstable power supply is a major danger to good teaching and learning. Students' everyday activities are primarily dependent on the availability of electrical power (Arkorful & Abaidoo, 2019). However, the majority of students live in rural areas of Nigeria, where there is currently a poor, inconsistent, and unreliable supply of energy (Ikediugwu, 2023).

Due to the recent spike in fuel prices in the nation, the majority of students cannot afford to run generator sets constantly, even though power is essential for the success of online learning. Students' opinions can differ based on how the technology is used, but when looking at it from an optimistic angle, one of them is that it can greatly raise student achievement. Elfaki (2019) found that, in addition to favorable attitudes, there was a substantial difference in learning results between online and traditional learners. Because the learning activities and resources in e-learning affect students' motivation levels and academic achievement, e-learning is significant. Specifically, these e-learning resources can draw students in and establish a personal connection with them, which in turn gives them more self-assurance and a sense of fulfillment when they receive praise or prizes (Kew, 2020). The course work for students benefits from the computer-mediated training.

Sanders and Morrison-Shelter (2015) examined the attitudes of students in an introductory biology course regarding web-enhanced instruction, building on prior research on the subject. The study's conclusions demonstrated that students' attitudes toward online learning are positive. Furthermore, despite the fact that technology use was discouraged, Farooq and Javid (2017) noted that pupils understood the value of the tool. Research conducted by Knowles and Kerkman (2017), Erarslan and Topkaya (2017), and Şen (2018) demonstrated that students exhibited a positive attitude towards online learning. According to Omar, Hassan, and Atan (2017), e-mentoring was predicted in part by the attitude of the learners. According to Elfaki's (2019) research, there was a statistically significant difference between the final examination scores of the students in the e-learning group (experimental) and the traditional group. The attitude of university undergraduates toward e-learning in the research area, Kwara State, has not received much attention. Previous studies' sample sizes were also less than those of the present study, which highlights the necessity of the investigation.

Research Question

1. What are the attitudes of undergraduates towards e-learning in Kwara State?

Research Hypotheses

1. There is no significant difference in the attitude of undergraduates towards e-learning in Kwara State on the basis of gender.
2. There is no significant difference in the attitude of undergraduates towards e-learning in Kwara State on the basis of age.

Methodology

For the study, survey-style descriptive research was used. The design was deemed appropriate since the researchers want to learn about the attitudes of Kwara State undergraduates regarding e-learning by gathering data from a representative sample of these students. Undergraduates in Kwara State comprise served as the study population, while the target population were selected undergraduates in two selected universities in Kwara State (that is, one government and one private university). A sample of 396 undergraduates in Kwara State were used for the study. A researcher-designed questionnaire titled “Attitude Towards E-learning Scale” (ATES) was adopted for this study a combination of inferential and descriptive statistics were used in the data analysis.

RESULTS

Research Question: What are the attitude of undergraduates towards e-learning in Kwara State?

Table 1: Percentage Distribution of Respondents’ Attitude towards E-learning

Item No	As a student:	Positive	Negative
1.	I am interested in studying courses that use e-learning	324 (81.8%)	72 (18.2%)
2.	I think e-learning enhances my learning experiences	354 (89.4%)	42 (10.6%)
3.	e-learning is efficient in bringing more innovation into the teaching and learning process	348 (87.9%)	48 (12.1%)
4.	I intend to utilize e-learning during the semester	282 (71.2%)	114 (28.8%)
5.	I am positive about electronic learning	294 (74.2%)	102 (25.8%)
6.	electronic learning environment makes studying easy for me	306 (77.3%)	90 (22.7%)
7.	I prefer to have courses on the internet, rather than face-to-face (classroom)	251.5%)	192 (48.5%)
8.	e-learning is more convenient for me to carry out my assignment	306 (77.3%)	90 (22.7%)
9.	e-learning is simple to work with	318 (80.3%)	78 (19.7%)
10.	I dislike the idea of using e-learning tools	258 (65.2%)	138 (34.8%)
11.	I prefer e-learning and I believe that it is better than old method of learning	240 (60.6%)	156 (39.4%)
12.	I believe using e-learning will improve the quality of my work	264 (66.7%)	132 (33.3%)

13.	I believe it will be a good idea to use e-learning tools	270 (68.2%)	126 (31.8%)
14.	I have a generally favourable attitude towards using e-learning	288 (72.7%)	108 (27.3%)
15.	e-learning supports individuals' learning styles and needs	276 (69.7%)	120 (30.3%)
	Grand Total	**4332 (72.9)**	**1608 (27.1%)**

Table one presents percentage distribution of respondents' attitude towards e-learning. According to the table, the majority of respondents (72.9%) have a positive attitude toward e-learning because they plan to use it during the semester, are interested in taking courses that use it, believe it enhances their learning experiences, and think it is an effective way to introduce more innovation into the teaching and learning process.

Hypothesis One: *There is no significant difference in the attitude of undergraduates towards e-learning in Kwara State based on gender*

Table 2: Mean, Standard Deviation and t-value showing differences in the Respondents' Attitude towards E-learning Based on Gender

Gender	N	Mean	SD	df	Cal. t-value	Crit. t-value	p-value
Male	138	26.61	2.002	394	4.12*	1.96	.000
Female	258	25.58	2.531				

*Significant, p<0.05

Table two presents the results differences in the attitude of respondents towards e-learning based on gender. Findings show that the mean for male is higher compared to female while the standard deviation was higher in the female at 394 degree of freedom. The calculated t-value was 4.12 and the critical t-value was 1.96, p= .000. Based on the result, there was significant gender difference in the attitude of undergraduates towards e-learning in Kwara State, hence the null hypothesis is rejected.

Hypothesis Two: *There is no significant difference in the attitude of undergraduates towards e-learning in Kwara State based on age*

Table 3: Analysis of Variance (ANOVA) showing differences in the Respondents' Attitude towards E-learning Based on Age

Source	Sum of Squares	df	Mean Square	Cal. F-ratio	Crit. F-ratio	P-value
Between Groups	15.120	2	7.560	1.30	3.00	.272
Within Groups	2275.426	393	5.790			
Total	2290.545	395				

Table three presents the results of Analysis of Variance on differences in attitude towards e-learning among undergraduates in Kwara State based on age. The findings revealed there was no statistical significant difference in the attitude of the respondents based on age {(F2,393) =5.790, P>0.05}, this implies the null hypothesis is accepted. Hence, there is no significant difference in the attitude of undergraduates towards e-learning in Kwara State based on age.

Discussion and Recommendations

The results showed that a higher proportion of undergraduates (72.9%) had a favorable attitude toward online learning. This result supports a study by Sanders and Morrison-Shelter (2015) that found students' attitudes regarding online learning are generally positive. In a similar vein, research conducted by Knowles and Kerkman (2017), Erarslan and Topkaya (2017), and Şen (2018) confirmed that students' attitudes regarding online learning were more positive during the final lecture week as compared to the first. According to Kirkwood (2018), students' attitudes toward the use of multimedia technology in online learning were similar. This might be because undergraduates can learn at their own speed and on their own time thanks to e-learning.

The results also showed that undergraduates in Kwara State had significantly different attitudes regarding e-learning depending on their gender. This suggests that respondents' attitudes on e-learning varied for men and women alike. This result contradicts Yang's (2016) study, which found that because online learning is feasible

and offers new learning opportunities, both male and female students had positive sentiments toward it. Khan (2017) discovered that there were no appreciable differences in the attitudes of engineering students, whether they were from rural or urban areas, regarding e-learning. It's possible that variables unrelated to the study's topic contributed to the notable difference found in this investigation.

Despite the age gaps among the respondents, they all had the same views about online learning. This is consistent with a research by Smith (2022) that discovered attitudes of students about e-learning were not significantly predicted by age. The study's findings revealed that students' interest, comfort level, and readiness to interact with e-learning platforms were similar across age groups. According to Johnson and Lee's study from 2021, there were no statistically significant differences in the positive sentiments that younger and older students had about e-learning. This could be because e-learning appeals to students of all ages because it provides flexibility in terms of study schedules and learning environments.

Based on the findings of this study, it is recommended that guidance counsellors should offer gender-sensitive support by tailoring advice and strategies to address the specific challenges faced by male and female students. This could include providing resources to boost self-confidence in using technology, promoting gender-inclusive participation in virtual classrooms, and addressing any gender-specific concerns related to e-learning. The study also recommends that counsellors need to provide age-appropriate guidance, such as helping younger students develop effective time management strategies and assisting older students in building their technological skills. Tailored workshops and advocacy programmes should be initiated in partnership school management and other stakeholders to address the specific needs of different age groups. Counsellors should offer targeted support during transitional periods, helping freshmen adapt to the online learning environment and offering strategies to maintain motivation for upper class men. Group counselling sessions and peer mentoring programmes should be established to create a sense of community and support among students at similar academic levels.

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