Graduate Journal of Pakistan Review (GJPR)
Vol. 4 No. 2 (2024)

Digital learning assets for future instructors: worldwide problems in Pakistan Present time

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Received: | Accepted: | Published:

Abstract: The rapid growth of digital technologies for education, as well as their application in the educational process for various objectives, necessitates the creation of pedagogical digital assets by teachers. Different types of Forms, modes of engagement, and the use of digital tools by the instructor for self-education and instructional goals are examples of digital pedagogical assets. This study summarizes the findings of a teacher survey on the characteristics of teaching with digital resources, as well as the issues faced and the characteristics of the instructional digital assets of the teacher of the future and will be beneficial for all . The survey was created using Google forms. The study's findings suggest that the time spent studying the characteristics of digital programmes and generating content to work in them was the most frequently chosen by teachers, independent of the subject matter they provided. For the future teacher, such qualities were highlighted: the ability to use digital applications to improve teaching quality, the short time of application of digital tools (if possible during training), and a combination of teachers' pedagogical skills and effective use of digital tools. According to the survey results, the digital educational assets of the future teachers can be identified as mastering a small number of applications, but with maximum compliance with the subject that the teacher teaches (obviously, for teachers of drawing, it is effective to use some applications, whereas for teachers of mathematics - quite different), creating quality content for teaching students with regard to age-specific perception, compliance with norms, and so on.

Keywords:

Educational assists, App, digital, learning environment, school learner , teachers.

Introduction

The modern learning environment for students of all 12 years demands that teachers have advanced abilities in working with digital apps and the ability to teach with their assistance. The use of digital technology in the educational process is becoming more widespread, and when used correctly, it may be a useful aid for learning. (Aidarbekova, Abildina, Odintsova, Mukhametzhanova, & Toibazarova, 2021). Furthermore, when digital technology is integrated into the learning process, pupils are far better prepared to perform effectively in today's society. (Heidi & Schnackenberg, 2019). The learning process has become more dynamic, demanding, and difficult than

ever before, despite the introduction of digital tools that should ease operations (OECD, 2018). The use of learning materials in a digital environment, as well as the development of teachers' skills and knowledge, entails the use of educational digital assets by teachers. Digital learning assets are resources used by teachers to carry out pedagogical activities in a digital context. The authors emphasised the importance of providing the digital learning environment with the ability to implement learning productivity as well as an effective tool for managing educational programme quality. Educational institutions significantly determine how digital technology is used in the classroom. Simultaneously, Yolcu and Akar-Vural (2021) discovered that teachers with a higher level of teaching autonomy obtain superior learning outcomes for their pupils (Drobotenko, Duka, Kurdumanova, Chekaleva, Sharov, and Dyrka, 2019). The school climate and the pattern of teacher-student relationships also have a significant impact on students' willingness to learn (Dincer, 2021). It has been demonstrated that the type of high school influences motivation to work well in the future (Aydin & şlek, 2021). Studies on the impact of tools on student learning demonstrate that students have positive attitudes towards new approaches and digital tools, as well as the importance of complete preparation for using various digital apps (Setiawan, Suharno, & Triyanto, 2019). Experts have discovered that videos should be shorter and have more animation to boost comprehension (Sahin, 2020).As a result, providing an effective learning environment for kids' future achievement is crucial to students' future performance. There is an ongoing dispute in studies over whether tablet-based assessment or traditional paper-based evaluation is superior, but these works cannot be compared (Blumenthal & Blumenthal, 2020). The difficulty of educating today's children can be efficiently handled by establishing tools, approaches, and practises that promote student attention and engagement (Akhmetshin, Bochkareva, & Tikhonova, 2019).It is feasible to attain high learning success by wisely combining the use of learning aids with the pedagogical skill of the teacher. To use educational web resources, the future teacher must perform the following tasks: search for web resources, create their own resources (assets), evaluate and select the best web resources while taking into account the characteristics of different students, develop personal educational web resources, place assets in the local or global network, and effectively use web resources in the learning process. It is vital for them to stay up to date on the newest changes and advances, as well as to expand their knowledge and skills (imşek, Yldrm, & ntaş, 2021).At the same time, we must not overlook the fundamentals of teachers' pedagogical skills, which are critical to the success of students' learning. Teachers must also teach children how to use digital programmes efficiently and adhere to screen time guidelines (Bull, Al-Ansari, Biddle, Borodulin, Buman, Cardon, & Dempsey, 2020). Cloud storage and Big Data, virtual and augmented reality, artificial intelligence and machine learning, cybersecurity and secure social media, the Internet of Things, and crowdsourcing, according to technical trends, will be critical in the future (Tsankov & Damyanov, 20). To ensure the quality of learning, the educational digital environment should be a communication place for all educational process participants, as well as a tool for managing the quality of educational programmes, teachers' productive work, and students' learning (Bulturbayevich, 2021). It is also critical to match computers, smartphones, and other devices' high technological features to the learning platform (Latipov, Galchenko, Rozova, Ikonnikova, & Filippova, 2019). Learning is the process of acquiring new understanding, knowledge, behaviors, skills, values, attitudes, and preferences(Richard Gross 2022). The ability to learn is possessed by humans, animals, and some machines; there is also evidence for some kind of learning in certain plants. Karban, R. (2015).Some learning is immediate, induced by a single event (e.g. being burned by a hot stove), but much skill and knowledge accumulate from repeated experiences. Lakoff, G., & Johnson, M. (2008).The changes induced by learning often last a lifetime, and it is hard to distinguish learned material that seems to be "lost" from that which cannot be retrieved. Johnson, M. (2008). Human learning starts at birth (it might even start before in terms of an embryo's need for both interaction with, and freedom within its environment within the womb Continues until death as a consequence of ongoing interactions between people and their environment.(Daniel T ,2011) The nature and processes involved in learning are studied in many established fields (including educational

psychology, neuropsychology, experimental psychology, cognitive sciences, and pedagogy), as well as emerging fields of knowledge (e.g. with a shared interest in the topic of learning from safety events such as incidents/accidents,(Daniel L. Schacter; Daniel T. Gilbert; Daniel M. Wegner 2011).*Associative learning* is the process by which a person or animal learns an association between two stimuli or events. Lillard (1972). In classical conditioning, a previously neutral stimulus is repeatedly paired with a reflex-eliciting stimulus until eventually the neutral stimulus elicits a response on its own. In operant conditioning, a behavior that is reinforced or punished in the presence of a stimulus becomes more or less likely to occur in the presence of that stimulus. (Gagliano, Monica, 2016).

Research Problem

Given the numerous studies on the effectiveness of various digital tools in the learning process, the rapid development of these tools, the increase in their number, and the heterogeneous use of digital tools in different schools and by different teachers, the problem of studying the need for teachers to master digital applications, the need to use various applications in the learning process, and the accumulation of a certain digital asset by teachers as a resource. It is necessary to investigate issues such as the relevance and needs of using digital tools in the learning process, the selection of effective tools for teachers and students (considering age, ability to operate digital tools), characteristics of perception of educational material with digital tools, compliance with screen time norms, teaching students literacy, and digital diet. In accordance with this, it is possible to investigate prospective instructors' digital pedagogical assets, allowing for the most effective use of digital technologies.

Research Focus

The study's goal is to investigate instructors' perspectives on the usage of digital applications and the creation of their own digital assets for educational activities with students of all 12 years.
The study's goal is to investigate instructors' abilities for future educational activities that make appropriate use of digital tools which will be beneficial for all in future.

Objective:
1. Investigate the various digital tools that are popular for educating general education students;
2. Examine educators' perspectives towards digital apps and their use in the learning process;
3. Investigate teachers' perspectives on creating their own digital assets for teaching students of all12 years.

Research Methodology

This research is an investigation of the building of their own digital asset for future educators. The study's tasks were solved using theoretical and empirical methodologies. During the research phase, a survey of instructors was conducted using the following questions:
1.is to Investigate the various digital tools that are popular for educating general education students?
2. is to Examine educators' perspectives towards digital apps and their use in the learning process?
3. is to Investigate teachers' perspectives on creating their own digital assets for

teaching students of all 12 years?

General Background

Teachers were invited to participate in the study by answering a questionnaire that consisted of picking "Yes" or "No" answers to certain topics. Using Google Forms, teachers completed the questionnaire anonymously. The study was conducted on teacher forum sites in Pakistan during the 2022-2023 school year.

Sample / Participants / Group

The experiment included 156 general education instructors aged 26 to 37 who were invited to participate by filling out questions on online teacher discussion sites. The demographics of the responders presented in Table 1:

Table 1

Number of teachers who participated in the study

Groups of teachers according to the age of their students	Teachers of Grades 1 - 4 (n = 56)		Teachers of Grades 5 - 8 (n = 43)		Teachers of Grades 9 – 12 (n = 57)	
Type of subjects taught	Humanities (n = 30)	Exact Sciences n = 25)	Humanities (n = 23)	Exact Sciences (n = 20)	Humanities (n = 31)	Exact Sciences (n = 25)

Created by the authors.

Instrument and Procedures

A questionnaire was prepared for this study, which consisted of two sections. The first examined the frequency of replies to questions about the issues encountered by teachers when using digital resources in the learning process. The questionnaire consists of closed questions with a Yes/No response option. The questionnaire's questions are presented in the results.

Data Analysis

Google Tabs was used to quantify the data obtained in case of all different types of subjects like humanities and sciences

Research Results

The findings of a teacher survey on global challenges

The survey analysis allows us to grasp the difficulties of our day in relation to the skills and talents of future teachers. Because the survey provided responses to open questions, the following are instructors' responses to the first question about access to communication technologies: An key concern for instructors in terms of digital competences was the quality utilization of online platforms for instructional purposes. Almost all of the teachers who took part in the study had problems or difficulties accessing devices that would provide full app-based learning during the learning

process using digital technologies (whether they began actively using technology during the Covid-19 pandemic or some apps were used in the pandemic to improve the quality of the teaching process). The topic of establishing digital competence in instructors, students, and their parents while working online, performing teacher assignments, and studying using digital apps is also relevant. One aspect of a teacher's high level of professionalism is the organization of training using digital technologies, taking into consideration their own skills, as well as the capacities of students and parents to access and use digital tools. If their own, the student's, or the parent's level of competence is insufficient, it is important to utilize such technologies that they are completely familiar with, or to learn and teach other participants in the learning process the digital competence skills required for learning. The issue of digital access and proficiency is mainly concerned with teaching pupils in grades 1 through 8, at the very least evidenced by the interview data, and interviews with high school teacher’s show that the bigger problem is the digital proficiency of the teachers themselves.

These data are presented in Table 2

Table 2

The results of a survey of teachers on the use of digital applications in the classroom

Teachers of students of certain age groups	Teachers of grades 1 - 4 (n = 52)		Teachers of grades 5 - 8 (n = 49)		Teachers of grades 9 - 12 (n = 55)	
Question	Humanities (n = 30)	Exact Sciences n = 25)	Humanities (n = 23)	Exact Sciences (n = 20)	Humanities (n = 31)	Exact Sciences (n = 25)
Please indicate the problems you encounter in your digital learning experiences						
The problem of accessing applications	6,25%	10,00%	19,23%	13,04%	13,79%	15,38%
The problem of using digital tools	37,50%	25,00%	19,23%	13,04%	51,72%	46,15%
Problem with the quality of digital learning materials	37,50%	70,00%	42,31%	52,17%	44,83%	53,85%
The problem of student comprehension of learning materials from a digital environment	78,13%	60,00%	46,15%	60,87%	75,86%	88,46%
Overloading the number of digital resources needed in the learning process	90,63%	85,00%	96,15%	82,61%	93,10%	92,31%
The time commitment						

required to prepare for digital learning	96,88%	95,00%	84,62%	82,61%	82,76%	80,77%
Time-consuming organizational costs of online learning	84,38%	85,00%	80,77%	82,61%	82,76%	84,62%
Inability to verify the veracity of a task performed by a student without assistance	78,13%	90,00%	96,15%	78,26%	75,86%	80,77%

How often do you use digital applications in the classroom						
Learning Digital Resources:						
Digital Academic Content Tools	68,75%	85,00%	92,31%	78,26 %	58,62%	80,77%
Tools for productivity	68,75%	70,00%	80,77%	91,30 %	86,21%	84,62%
Tools for communication	15,63%	20,00%	19,23%	26,09 %	13,79%	23,08%
Features to support learning in the digital space						
Visual support features	100,00%	100,00%	100,00%	100,00 %	100,00%	100,00%
Listening tools	37,50%	60,00%	53,85%	60,87 %	48,28%	38,46%
Translation tools	75,00%	60,00%	46,15%	60,87 %	51,72%	53,85%
Collaboration support tools	46,88%	75,00%	46,15%	60,87 %	48,28%	57,69%

Created by the authors.

The problems encountered by teachers during their use experience allow us to summarize that almost all teachers noted time consumption, peculiarities of applications on various digital devices, overload of the number of digital resources required for the educational process, and the inability to check the veracity of the task completed by the student without outside help. Who participated in the poll, regardless of the age of their students or the subjects they teach. This highlights the need for two things: first, purposeful teacher training to improve their skills on a worldwide scale, and second, simplification and, if possible, decrease of the weight of digital gadgets in the learning process.

The second section of the questionnaire asked about the pedagogical assets that a teacher will require in the future for effective instruction. The results are presented in Table 3:

Table 3

Exploring the characteristics of the teacher of the future with the use of digital tools in teaching

Teachers of students of certain age groups	Teachers of grades 1 - 4 (n = 52)		Teachers of grades 5 - 8 (n = 49)		Teachers of grades 9 - 12 (n = 55)	
Question	Humanities (n = 30)	Exact Sciences n = 25)	Humanities (n = 23)	Humanities (n = 30)	Exact Sciences n = 25)	Humanities (n = 23)
What are the criteria for choosing digital apps?						
Relevance of digital tools to learning objectives	87,50%	85,00%	84,62%	73,91%	62,07%	84,62%
Simplicity	87,50%	90,00%	84,62%	78,26%	72,41%	84,62%
Accessibility	75,00%	120,00%	92,31%	95,65%	86,21%	80,77%
Ease of use	87,50%	85,00%	80,77%	91,30%	82,76%	84,62%
Synchronization across devices	90,63%	90,00%	92,31%	95,65%	86,21%	88,46%
Time consumption for learning functions and results of using digital tools in teaching	65,63%	90,00%	88,46%	78,26%	86,21%	80,77%
The efficiency of using a digital tool for learning materials and for testing the level of knowledge on the topic being taught	71,88%	75,00%	53,85%	78,26%	75,86%	96,15%
Mastery of multiple applications, however, with the highest level	93,75%	95,00%	96,15%	95,65%	82,76%	96,15%
Possibility of using the educational material in different forms (video, audio, text versions, flashcards)	87,50%	85,00%	96,15%	91,30%	82,76%	88,46%
Possibility of a high-quality check of the level of knowledge of students	87,50%	85,00%	92,31%	91,30%	86,21%	84,62%
What do you think will contribute to effective student learning?						
Combining the effective use of pedagogical skills with	87,50%	85,00%	80,77%	91,30%	82,76%	80,77%

the use of digital tools						
Using a large number of digital tools in teaching	3,13%	25,00%	19,23%	13,04%	13,79%	15,38%
Learning to use digital applications as a supplement, an aid to learning	56,25%	85,00%	57,69%	65,22%	75,86%	88,46%
Learning to be information literate	90,63%	90,00%	92,31%	91,30%	82,76%	84,62%
Learning to observe an infodiet (not using digital devices)	96,88%	95,00%	92,31%	91,30%	86,21%	100,00%

Created by the authors

All of the aforementioned elements for the success of employing digital tools to teach students of all 12 years are confirmed by the data. Regardless of what subjects teachers teach, their replies to the questions were consistent. The responses of almost all respondents that it is necessary to teach students to observe info diet (to give up digital devices for a certain period of time), master several applications, but at the highest level, to combine the effective use of pedagogical skills with the use of digital tools are significant results.

All objectives of research maintain and checked that study meets. Study objectives matched with tabulation with of a lot of figures which are in different tables. In this paper first learning objectives of digital applications in the classroom and problems encounter during digital learning experiences consist of different figures and regarding to teacher of the future with the use of digital tools in teaching contribute to effective student learning have different figure (table 2)

Based on the findings of this study, we believe that the digital educational assets of future teachers will be mastery of a small number of applications, but with maximum compliance with the subject that the teacher teaches (obviously, for teachers of drawing, it is effective to use some applications, whereas for teachers of mathematics - quite different), creation of quality content for teaching students with regard to age-specific perception, compliance with the curriculum, and so on.

Discussion

Regardless of the subjects they provide, the work of a teacher in today's society necessitates a certain level of development of abilities using digital technologies. This study did not look at specific applications because it is generally the choice of the educational institution, but rather at general concerns regarding how future teachers can use digital technologies to effectively instruct pupils. To date, everyone involved in the educational process has used digital technologies in some or all of their instruction (during remote learning). However, in addition to preferences and assistance, the use of digital technologies entails a number of new obstacles (Heidi & Schnackenberg, 2019). On the one hand, the learning process has become more demanding (OECD, 2018), but on the other hand, it has become less efficient in some areas. The use of digital resources in education necessitates extensive preparation on the side of the teacher, which does not always ensure a good learning experience for the student. Long instructional videos, for example, are ineffective (Sahin, 2020), and

long periods of sitting with digital devices are harmful to students' health (Bull, Al-Ansari, Biddle, Borodulin, Buman, Cardon, & Dempsey, 2020).According to the study's findings, teachers must understand a limited number of digital applications while maximising the requirement to deliver instructional material in certain courses, enhance student attention, and engage successfully. Teachers must develop an individualized approach to student learning, adopt innovative strategies, and continuously improve their teaching methods (OECD, 2018). It is also vital to connect the teacher's pedagogical expertise with the use of digital tools, and the necessity to establish such an expression in teaching practice as teacher mastery in the use of digital tools can be highlighted.

Compare results with other studies

Items	Study Results	Other Studies with Ref
level of development of abilities using digital technologies but in specific look not general	Normal use	Preferred Heidi & Schnackenberg, 2019
learning process	Found not advance level	More demanding OECD, 2018
digital resources in education necessitates extensive preparation	Normal	In effective Sahin, 2020
digital devices are ……to students' health	Harmful	Long period Bull, Al-Ansari, Biddle, Borodulin, Buman, Cardon, & Dempsey, 2020
limited number of digital applications	teachers must understand	Maximising the requirement to deliver instructional material in certain courses, enhance student attention, and engage successfully OECD, 2018
connect the teacher's pedagogical expertise	Need	Connects with teaching practices and learning more Amato 2017

Conclusions and Implications

The Covid-19 epidemic has hastened the adaptation of teachers, students, and parents to the distance learning environment. Now that the fundamentals of use have been grasped by the majority of participants in the educational process, we may investigate the challenges of using digital tools and the future vision of digital educational assets of educators. The survey's primary findings are the necessity for

teachers to master specific apps that most successfully assist them study exactly the subject they teach, to augment their teaching skills with digital tools rather than replace them, and to train students in info dietary skills. This will help kids to think about the information they get, to properly absorb it, and not to become overwhelmed with a variety of information (from what they read on social media or in the news to what they were taught in school.Teachers who took part in the survey reported substantial issues with students' time spent mastering digital apps, their grasp of learning material, and the veracity of their comments. Future research should concentrate on the efficacy of apps in the learning process for certain subjects, the amount of time children of all 12 years spend in the classroom using digital tools, and the amount of digital assets educators have. The research findings enable school leaders and instructors to plan the usage of certain digital tools in the classroom, shorten teachers' time to acquire the basics of digital technologies, and improve overall instructional efficacy. It is possible to create model digital assets for teachers at the school level, taking into account the age of the children being taught, the school's and students' access to digital devices, as well as the possibility of personal development of the teacher through mastery and effective use of digital tools. Some challenges are

Students misusing technology.

Teacher knowledge and professional development.

Keeping students safe online.

Cost of new technology.

Keeping up with changes

Acknowledgements

The authors would like to thank all of the participants who took part in the survey and the digital platforms through which this study was conducted.

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