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Exploring the Influence of Educational Technology on Student Engagement

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Abstract

This study seeks to exploring the influence of educational technology on student engagement. This study also identified recent trends and challenges related to the implementation of technology in education, such as the need for technical support and the potential for distractions during class. The educational technology and student engagement are important factors that can contribute to sustainable student satisfaction, in today's classrooms, technology plays a crucial role and has the potential to greatly influence student involvement. Students who are interested in what they are learning are more likely to speak out in class, contribute to debates, and seek clarification when needed. Students are more likely to participate when they have a hand in shaping their own educational experience. Consequently, schools should work to make instructional technology user-friendly and intuitive, and they should also establish a setting that encourages students to actively participate and work together. Institutions can boost student engagement and performance in the classroom by making these changes. In order to comprehend the impact of instructional technology on student involvement, this research study was executed.

This study used quantitative research approach with a random sampling technique method to collect the data from, 300, Undergraduates students from different universities, alongside the implementation of a self-made 5-point Likert scale tool. It is essential to understand how the educational technology influences student engagement through three dimensions. Behavioral engagement, Cognitive engagement, Emotional engagement, Educational technology

engagement. The student engagement scale has an employability perspective, teaching perspective, and learning perspective as subscales. Initially, the study examines the influence of the educational technology on student engagement. The results showed that technology-based education had a positive impact on student learning outcomes, including student engagement, knowledge retention, and critical thinking skills. Additionally, the use of technology in education led to increased student engagement and motivation, as well as improved teacher-student interactions.

Keywords: Educational technology, student engagement, higher educational institutions

Introduction

In the past 20 years, the use of educational technology has grown by leaps and bounds (McClung, 2019). Schools are choosing to use more tech-based ways to get students involved, like one-to-one devices, mobile computer rooms, and letting students use their own devices (McClung, 2019). Using different kinds of educational technology across the country is meant to make learning more effective and interesting for students (Wilkes, 2020). Since the beginning of digital technology, researchers have been interested in how well and how efficiently technology affects the ways and outcomes of teaching and learning (Rashid & Asghar, 2016). Information and communication tools are changing quickly, which can be both a big problem for teachers and a great chance for students. A lot of these apps and devices are used in schools as teaching tools and they work really well. When it comes to keeping educational institutions' hardware up to date for use in teaching and learning, having good technology skills like being able to use computers and a wide range of online resources well, and combining different delivery methods, teaching styles, and learning styles successfully by using technology in a planned and strategic way along with the best parts of face-to-face interaction, problems can arise. On the other hand, the possibilities look more appealing: more student engagement and academic success; more effective and varied ways for teachers to interact with students; easier access to learning materials for both teachers and students; and better support for managing lessons and giving formative assessments. Several studies have already shown that student involvement affects how much students learn, how well they do in school, and how their minds grow (Hu & Kuh, 2002; Kahu & Nelson, 2017; Zhoc et al., 2019). How much students join in activities that are related to school is an important way to measure how engaged they are. Means et al. (2010) said that using digital tools alone did not help students do better in school. Teachers have a big effect on how engaged their students are because the key is to use technology and teaching methods together well (Bond et al., 2019). According to Bond et al. (2020), Krause and Coates (2008), Nelson Laird and Kuh (2005), and Zhoc et al. (2019), we need to learn more about how technology in the classroom affects student involvement. The use of learning technology is an important thought that should be built into student engagement to improve how teachers do their jobs and how well students do in school. A lot of studies have found a positive link between using technology and engagement measures.

Significance of the Study

This study provides important new insights into contemporary teaching practices and sheds light on the complex interaction between educational technology and student involvement. Through investigating the ways in which different types of technology affect student engagement, motivation, and interaction with course materials, this study adds to the current conversation about successful teaching methods. Knowing how educational technology affects student participation can help educators and policymakers make informed decisions regarding the advantages and disadvantages of integrating it into the curriculum. Furthermore, the results can direct the creation of customized interventions and instructional strategies meant to promote a more dynamic and

engaging learning environment. In the end, this study has the potential to improve overall learning results and prepare students by increasing student engagement through the judicious use of educational technology.

Objectives of the Study

- To investigate how various educational technologies, affect students' participation in a range of academic subjects and learning contexts.
- To evaluate how students' use of educational technology and their participation in class activities and assignments relate to each other.
- To look at how student motivation and involvement in class activities are affected when educational technology is included into pedagogical procedures.
- To determine practical methods for maximizing the application of instructional technology to raise academic attainment and student engagement.

Research Questions

- What effects does the use of particular educational technologies have on students' participation in various subject areas?
- What patterns of contact do students have with educational technology, and how do these patterns connect to their academic achievement and engagement levels?
- How does the use of educational technology in teaching methods affect students' motivation, involvement, and general interest in the course materials?
- Which instructional technologies are the most effective for maximizing student engagement and promoting active learning in the classroom?

Literature Review

The different ways that students use technology have a big effect on their learning and personal growth (Sun & Rueda, 2012). It is one of the most important ways to raise the level of academic success, according to Lutz and Culver (2010). The field of student engagement study has grown and expanded since the early work of pace. It now looks at a lot of different factors, such as how much effort students put into affective learning (Shernoff, et al. 2016). Teenagers and young adults should start learning how to use technology for different things early on because it has become an important part of modern life. In 2014, Ahmad. Kids today study and think in different ways than kids did even ten years ago. Researchers have found that when students use technology in the classroom, they not only enjoy learning more, but they also find it more interesting and useful. Engagement, which has been known for a long time to be an important part of student learning and academic results (Schindler, et al., 2017), is linked to students' academic success, persistence, and retention. (2019 Burke). The first study on student engagement, done by Ralph Tyler in 1947, looked at how much time students spent on schoolwork and extracurricular events.Recently, the attention has shifted to how students use different tech tools (Bal & Bicen, 2017). Computers, cell phones, different social media apps, online games, and other digital technologies have always been a part of our lives (Ahmad, 2012). Hamilton-Hankins (2017) says that student involvement is made up of many different parts, some of which have been studied in relation to technology use. Researchers have traditionally looked at two key aspects of student engagement: how engaged they are intellectually and how engaged they are behaviorally. New study, on the other hand, has added

more dimensions, such as reflective engagement and social engagement. Many people use WordPress, WhatsApp, YouTube, Facebook, near pod, Zotero, and other tools to teach and learn. You can easily get these tools on mobile phones, laptops, and desktop computers. Online, both teachers and students can find a huge range of educational technology (Chen, et al., 2010). As Banit et al. (2013) say, teachers must be able to help students use technology well in the classroom if they want to adopt 21st century learning. As we've already said, technology meets the needs of digital locals and is the best way to find maintainers. Most universities in Pakistan have already set up and offer technological systems that are meant to get students more involved in the learning process (Bal & Bicen, 2017). The goal of this study is to find out how these systems affect different parts of student engagement.

Educational Technology use in General Education

According to research by McClung (2019), Brewster (2016), and Leo and Puzio (2016), using educational technology in regular classes can help students do better in school in general. Arkansas Tech University's McClung compared the effects of one-to-one laptop use with those of more common types of technology used in the classroom. McClung found out how teachers and students felt about IT in the classroom and how that affected their learning. McClung found that students did worse in school in traditional classrooms than in classes that put a lot of emphasis on technology (McClung, 2019). The levels of achievement of kids were figured out by looking at their Aspire Summative Assessment scores. When compared to students who didn't have access to one-to-one technology, those who did did better in all areas of study. In some areas, though, the gains were a bit higher than for the students who didn't have a one-to-one teacher. It's the same when you learn certain fields. In one case, Brewster looked at how well kids did in social studies in a blended learning setting. Blended learning is what teachers do when they use digital tools in addition to more traditional lesson plans. In 2016, Brewster did a study that compared how well sixth and seventh graders did in traditional and hybrid classes. Brewster used data from unit tests in math and social studies, as well as data from sixth and seventh grade groups that used traditional and blended learning, to compare and contrast the two sets of results (Brewster, 2016). Comparing these studies side-by-side can help people in charge of schools make decisions about how to use technology in the classroom (McClung, 2019 & Brewster 2016). Brewster also found that students who used mixed learning did much better in social studies class than those who did not. The average completion rate for sixth graders who had blended learning was 86%, while the average completion rate for sixth graders who did not have blended learning was 76% (Brewster, 2016). McClung (2019) and Brewster (2016) say that instructional tools can help students do better in school and get better grades.

It is known that differentiated classes are the best way to help all of their students do well in math (Murphy, 2016). The US Department of Education (Perry & Steck, 2015) says that only about a quarter of high school seniors showed that they were proficient in math areas in 2013. Murphy from Liberty University looked at a student from 2015 who took part in Perry and Steck's study on what happens when technology is used in the classroom. iPads were used in the classroom as part of the study. Incorporating iPads into geometry classes to get students more interested was what this study was mostly about. Murphy's 2016 study looked at whether using iPads could make students more interested in learning and help them do better on tests. Murphy's research shows that students in the iPad group participated more in class than students in the non-iPad group. The

results of this study supported the idea that using iPads for schoolwork got more students involved. The groups that didn't have iPads, on the other hand, did a little better in school. The study showed that using iPads helped students' motivation, involvement, and relationships with teachers. However, it did not explain why the students in the group that did not have iPads did better in school (Murphy, 2016). Murphy's study shows the opposite of what Brewster found: that students did worse on tests and in school after using educational technology like iPads (Brewster, 2016). Higgins and BuShell (2017) also looked at 207 students who had their own gadgets to see if it affected their grades and the way they got along with their teachers. Shell and Higgins (2017). Higgins and BuShell (2017) say that one-to-one methods make it easier for teachers and students to talk to each other and get students involved. Several polls of students found that having one-to-one gadgets in the classroom made it easier for teachers to talk to their students and sparked their interest in learning. Murphy (2016) also found that one-to-one gadgets did make it easier for teachers to talk to students who were having trouble in class and helped teachers build bonds with their students. Murphy didn't agree with Higgins and BuShell; they didn't see much proof that giving each kid a personal device helped them do much better in school. Higgins and BuShell say that the use of one-to-one technology was not the only reason why kids did better in school. In the end, Huggins and BuShell said that the fact that teachers use technology in the classroom shows that technology can help teachers and students become closer. The authors, Higgins and BuShell, found that interactions between students and teachers were the most important factor in how well kids did in school. They also said that one-to-one devices might help students get better grades if they helped improve those relationships.

Educational Technology use in Student Engagement

"Technology also affects student engagement to learn," say Al-Bataineh and Al-Bataineh (2016) and Harris et al. (2016). This means that the right use of educational technology is very important for students' success. Harris (2016) looked at fourth graders to see if one-to-one technology changed how involved students were. A year after computers were given to students, Harris et al. (2016) asked them some questions. Respondents who had access to devices in schools said they were more motivated to study on their own (Harris et al., 2016). Harris et al. (2016) say that the new technology may have helped students do better in school and also made them more interested. Students with devices did better on standardized tests given at the beginning of the school year, getting an average score of 82.58%, while students without devices did worse, getting an average score of 65.87 percent (Harris et al., 2016). Students' eagerness and willingness to use new technology may have helped them get better test results (Harris et al., 2016). On another test given at the end of the year, students who had access to the laptop all year got an average score of 78.16%, while students who didn't had access got an average score of 68.16% (Harris et al., 2016). The study found that students who had access to devices were more interested at the start. When these new tech tools were first brought into the classroom, they had a big impact on how motivated and well-behaved the students were. The kids' initial excitement waned as they became more familiar with the tools. Even though excitement faded toward the end of the school year, there is proof that incorporating gadgets into the classroom improved student participation and academic performance. WebQuest is an online learning tool that Francis added. Lessons and other materials on WebQuest come from the internet. When students used WebQuest as a learning tool in the classroom, they were able to share their ideas and feelings about it through questionnaires (Francis,

2017). Francis (2017) says that fourth and fifth graders who used WebQuest said they were more interested and excited about their work and learning. In addition, Francis (2017) found that most of the 95 kids in fourth and fifth grade (73 of them) said that technology motivated them to do better. It turns out that using technology in the classroom can get kids to work harder and be more interested. The results of this study back up what Jennifer Harris found in 2016. She found that kids are more interested in learning when they have access to technology. Yet another study in the Journal of Educational Technology, Research and Development looked at how iPads can be used in sixth and seventh grade math classes (Fabian, Topping, & Barron, 2018). The goal of this study was to find out how students felt about using technology in the classroom and how often they did so. From September to December, students used iPads to work together. Fabian et al. (2018) interviewed students and found that most of them (80%) had a good opinion of the activities as a whole. Fabian et al. (2018) say that students in the experimental groups were more interested in math and said it was more fun for them than students in the control groups.

Research Methodology

Using a self-made 5-point Likert scale and a quantitative research approach with a random sampling technique, this study collected data from 300 undergraduates from various universities. An essential part of this study methodology is the random sample technique. This makes the group more representative and lowers the chance of selection bias. This means that the results can be used more generally in the teaching field. Random sampling is necessary to get results that are scientifically sound and can be used in more situations. We think that a sample of 300 students will give us fair and large data. It ensures that the study's findings are grounded in a broad and diverse sample of students, allowing for a more thorough comprehension of the research topics, while also providing a balance between statistical power and practicality. People are given a 5-point scale that usually goes from "Strongly Disagree" to "Strongly Agree," with "Neutral" in the middle. They are asked to rate how much they agree or disagree with each statement. The tool is made up of a series of statements or questions. The Likert scale is a structured and measurable way to find out what people think and feel. Because the Likert scale can be used in many statistical studies, it is also much easier to draw useful conclusions and make comparisons from the data it collects. Inferential statistical tests, standard deviations, and mean scores can be used to look for trends, patterns, and big changes in the answers given by students.

Data Analysis

Table 1: *Demographic variables*

	Frequency	Percentage
Male	175	50%
Female	175	50%
College/University	300	100

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Table 1 shows study participants' demographic data There are 175 m ales and 175 females, representing an equal gender distribution and 50% of the sample as a whole. Furthermore, all 300 individuals, or 100% of the sample, are from college or university students.

Table 2: *Reliability statistics*

	Cronbach's alpha	**No of items**
Behavioral engagement	939	8
Cognitive engagement	960	8
Emotional l engagement	939	8
Educational technology engagement	950	10
Total	974	34

Based on their Cronbach's alpha values, the reliability data presented in Table 2 show that the several engagement scales utilized in the study exhibit excellent levels of internal consistency. With eight items on each scale, the Cronbach's alphas for behavioral engagement, cognitive engagement, and emotional involvement are, respectively, 0.939, 0.960, and 0.939. The Cronbach's alpha for educational technology engagement, which is based on ten items, is 0.950. The overall Cronbach's alpha for the 34 items on the scale, which represent the many forms of interaction, is 0.974. These high alpha values provide compelling evidence of the instrument's dependability in evaluating engagement since they imply that each scale's items are extremely dependable and consistently measure the relevant variables.

Table 3 *ANOVA*

Model	**Sum of squares**	**f**	**[ean square**		**Sig**
Regression	15.105		5.035	87.137	000[a]
Residual	49.425	64	87		
Total	54.529	67			

The findings of an ANOVA (Analysis of Variance) test used to gauge a regression model's significance are shown in Table 3. With three degrees of freedom (df), the regression's "Sum of Squares" is 115.105, yielding a mean square of 35.035. With 264 degrees of freedom and a residual sum of squares of 49.425, the mean square is 0.187. With 267 degrees of freedom, the sum of squares for the regression and residual combined is 154.529. The regression model is statistically significant at the 0.001 level, as shown by the F-statistic of 187.137 and the significance value (Sig) of.000. This suggests that the dependent variable is significantly impacted by the independent variables in the model taken as a whole.

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Table 4: (*Hypotheses, Beta, T Statistics and P values)*

Hyp	Construct	mean	B- value	T-value	P-value	Decision
	Use of technology cognitive engagement	>0.467	0.466	11.118	0.000	Supported
	Use of technology behavior engagement	>0.621	0.562	15.916	0.000	Supported
	Use of technology reflective engagement	>0.461	0.411	9.221	0.000	Supported
	Use of technology social engagement	>0.472	0.564	9.573	0.000	Supported

To find the hypothesized relationships among the variables the pls – bootstrapping occurred and the results showed that use of technology has significantly positive impact on students' cognitive engagement at (B = 0.466, mean = 0.467, t-value = 11.118, P = 0.000) thus the H1 was supported. Moreover, the use of technology has significantly positive impact on students' Behavioral engagement (B = 0.562, Mean = 0.621, t-value = 15.916, P = 0.000) therefore H2 was supported. Also Use of technology has significantly positive impact on student's Reflective engagement (B = 0411, Mean = 0.461, t-value = 9.221, P = 0.000) Thus the H3 is also supported. Finally Use of technology has significantly positive impact on students' Social engagement (B = 0.564, Mean = 0.472, t-value = 9.573, P = 0.000), hence H4 was supported.

Discussion

The main goal of this study was to look at how technology might change many parts of students' participation. The goal of this literature study was to find out all the different ways that technology can change how involved students are in their work. The four hidden factors that came up from the literature review were learners' cognitive, behavioral, reflective, and social participation. The study's results supported the four hypotheses and showed that using technology in the classroom made students more involved. Gebre et al. (2014) say that students usually feel good about using technology in the classroom, which is a good sign for their ability to use laptops, cellphones, and computers to look at data and compare different ideas. A lot of tech tools make reflective involvement easier. This is a part of metacognitive awareness that involves understanding your own role in the learning process. Video blogs, online tutorials, discussion boards, YouTube videos, and short animated movies are all examples of online resources that can help students think about and use metacognitive and self-explanatory techniques in the classroom (Schindler et al., 2017). Students behave better and are more interested in learning when technology is used in the classroom. Hartnett (2015) says that students are more interested in their own learning when the attention is on them instead of the teacher and there are fewer chances for the teacher to take over. Zinan and Sai (2017) say that letting students do learning tasks that they are in charge of on their own makes them more independent.

Conclusion

Students who have access to and use teaching tools do better in school than students who don't (Daehlen 2017). According to the study (Francis, 2017), bringing technology into the classroom does often get more students involved. Students care more about and are proud of their education when they can use technology to make it fun and tailor it to their needs (McElhany, 2017). Students who learned in classrooms with technology were more interested and had a better time overall than students who learned in classrooms without technology (Estapa & Nadolny, 2015). It was also shown in this review of the literature that many types of instructional technology do help kids do better in school. When students like what they're learning in class and have the tools they need to use technology to their advantage, they can stay interested at all times. Students are more likely to finish their work when they are involved, which in turn improves their academic success.

Recommendations

This study emphasized the need of ensuring that students receive adequate training on how to use technology and how to overcome any obstacles that may arise when implementing technology in the classroom. In addition, the study concluded that many abilities may be honed with the help of technological tools. Nowadays, getting students to actively participate in class is often accomplished through the use of various technological tools. The teacher's use of social media platforms like WhatsApp, Facebook, Telegram, etc. for educational purposes, the influence of technology on student involvement both in and out of class, and other related issues were largely disregarded. The question of how a teacher may make effective use of social media platforms to engage students and promote learning remains an essential one. More cross-sectional studies are needed to identify the elements that impact student involvement, despite the abundance of literature on technology-enhanced learning. Students' effective involvement and level of engagement over time are indicators of academic accomplishment, however this study merely aims to quantify student engagement in a technology-rich environment.

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