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Technology integration in higher secondary schools and its impact on engagement and satisfaction A case on Indonesia

Siti Ma'rifah

Sekolah Tinggi Agama Islam Shalahuddin Al-Ayyubi
sitimarifahma@staisa.ac.id

Obsatar Sinaga

Padjadjaran University
obsatar.sinaga@unpad.ac.id

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Abstract

This study aims to explore the effectiveness of technology integration on the students' motivation and engagement. For data collection, the researchers conducted online interviews and questionnaires survey from teachers of different specializations at Indonesia Higher secondary School. The researchers used the quantitative and qualitative research approach to collect the data by using convenient sampling technique. The findings of the study from both of qualitative and quantitative perspective revealed an efficient effect of the technology on the student's Satisfaction and engagements when the schools have good infrastructure in technology like tools, and devices. Therefore, based on these findings, the report suggested that the school's technological climate be improved with the help of private sector funding. It also recommends that the Indonesian Ministry of Education provide unique training programs for educators to improve their abilities to use technology in the classroom.. The research limitations and future directions were also discussed at the end of the study.

Keywords

technology integration, engagement, Indonesia

Introduction

The need for education that integrates these technologies is constantly growing as new and evolving digital connections make the world smaller. One instructional strategy to raise student achievement and engagement is for teachers

and students to use touchscreen tablets in 1:1 classroom settings. Although it can be difficult to integrate technology at meaningful levels because of digital distractions, it is crucial for students to use 21st century technology to get ready for the future. This confirms the requirement that educational leadership practice include digital leadership as a key component of transforming organizations to succeed in the technological societies of this converging world. The effectiveness of teachers, student engagement, and the use of technology in the classroom has all been shown to have measurable effects on student achievement (Beatson et al., 2020). The world was reminded by Tucker and Stronge (2005) of the transformative power of an effective teacher. Their work quantified the percentile gains that can be achieved when an effective teacher employs the most effective techniques, citing the research of (Gallivan, 2019; Stronge, Ward, Tucker, & Hindman, 2007). Technology can improve the delivery of curriculum by elevating effective teaching strategies, despite the fact that it is merely a tool and not a strategy in and of itself. For instance, just before Tucker and Stronge (2005) made their revelations about the effectiveness of teachers,

Marshall (2014) proclaimed the benefits of technology on student achievement.

The impact of the disruption caused by the Corona virus pandemic and subsequent public health measures on teachers' capacities to support student participation in technology education (Toseeb, Asbury, Code, Fox, & Deniz, 2020). On the one hand, epidemiological shifting teaching prevents the learning of unmotivated students (Toseeb et al., 2020), and on the other hand, Both education and schools have begun to undergo this shift as a result of the COVID-19 epidemic, which came up quickly and unanticipated (Iivari, Sharma, & Ventä-Olkkonen, 2020). Fortunately, however, the tools used in learning influence and modify learning (Schuck, Kearney, & Burden, 2017), and with the emergence of the Coronavirus pandemic, students' reliance on technological devices in distance learning has become critical. Today's students have been surrounded by technology from their childhood (Egbert, 2009; Iivari et al., 2020). Almost all of their daily practice including their learning is intertwined with technology (Ismail & Hamarsha, 2020). Technology has revolutionized the field of education. Costley (2014) states, "Technology has a positive impact on student learning. The importance of technology in schools cannot be ignored. In fact, with the onset of computers in education, it has become easier for teachers to impart knowledge and for students to acquire it. This is what Tinio (2002) confirms by stating that information and communication technology has a tremendous impact on the acquisition and assimilation of knowledge for both teachers and students.

The use of technology has made the process of teaching and learning all the more enjoyable (Raja et al., 2020). The influence of technology on the learning-teaching process is stated by Ismail and Hamarsha (2020) that technology products are certainly needed in online learning-teaching processes and its role to deliver knowledge is very much influential. Online learning using the full program has

become media technology, such as HP, laptops, and laptops, in light of the Corona crisis, and this has had many implications in the learning and education process (Kaharuddin, 2020).

Technology has been used in the classroom in recent decades, and many studies show that the effective integration of technology into classroom instruction positively affects students' satisfaction, engagement, and interest in learning. Technology positively affects student learning. Technology makes students more engaged, and more information saver. "Technology also provides practical learning opportunities that can be incorporated into all areas of the school curriculum, including mathematics, and it gives students opportunities to collaborate with their peers leading to learning from one another. Together, these factors can have a positive impact on student learning and satisfaction" (Costley, 2014).

A report issued by the US Department of Education stated that students felt that using technology made them feel smarter and more unique, allowing them to get to know others. Seventy percent of the students surveyed indicated that computers "made learning more enjoyable." The study by Swan et al. 2005 also indicates that incorporating technology in the classroom significantly contributed to the self-esteem of students and led to increased interaction in the classroom. Among the most significant findings of research regarding utilization of technology with in process of education and learning seems to be evidence of technology's usefulness in inspiring and guiding learners (Godzicki, Godzicki, Krofel, & Michaels, 2013).

Utilizing multimedia programs and educational initiatives that aim to advance learners' skills and expertise as online films and multimedia presentations contributes to higher levels of student happiness, involvement, passion, accomplishment, and overall classroom performance (Boster et al., 2007; KIM, KOZAN, KIM, & KOEHLER, 2013). Lastly, it's crucial to remember that technology never, by itself, increase student pleasure or involvement, thus care should be taken to consider in which way the instructor integrates technology into framework of education and learning. Therefore, it is crucial for instruct instructors in the proper utilization of technology (Tortorella, Narayanamurthy, & Cauchick-Miguel, 2021). In the educational context, the possibility of achieving educational objectives and improving its relevance and quality can be achieved through information and communication technology. Thus, technology can be used in the classroom to enrich the learning experience. The application and integration of technology in education ensures the achievement of a successful semester and prepares students for their future careers in the twenty-first century (Beck et al., 2017).

The degree to which teachers are enthusiastic about using technology in the classroom affects how satisfied and engaged their students are with their studies. There is no doubt that students resemble their teachers in appearance. Regarding the likelihood of learning, there is a strong correlation between teachers' satisfaction and that of their students. According to this study, students'

satisfaction is positively impacted by technology and teachers' satisfaction. An early study from 2000 that supports these conclusions was published. The study discovered that students' satisfaction would quickly rise if teachers used technology in their instruction (Atkinson, Derry, Renkl, & Wortham, 2000; Hu, Wong, Adesope, & Taylor, 2020).

There are contrasting views on how effective technology-based learning is. There is proof that using technology could boost students' achievement and self-efficiency (Firoozi, Kazemi, & Jokar, 2017). Even though this might be the case, some studies indicate that using technology in some subjects does not help students. Technology integration must serve a purpose in order to be advantageous for achieving successful outcomes (Ismail & Hamarsha, 2020). When given the chance to use technology tools to create authentic learning experiences, students' engagement and satisfaction increased, according to some studies by Morosan, Dawson, and Whalen (2017), Bayoumi, Ramli, Ebrahimi, Rosman, and Khan (2022), and others. Because it connects their non-digital lives inside of school with their digital lives outside of it, students find technology to be more engaging. This study aims to investigate how well teachers' use of technology during COVID-19 affected students' satisfaction and engagement.

Literature Review

Technology Integration in Education

The challenge for institutions of higher learning that have fully immersed themselves in technological initiatives is figuring out what level of technology integration is necessary to achieve this goal. This difficulty supports the need for additional study into properly gauging technology integration. Douglas et al. (2017) highlighted the need for continuous evaluation of implementation within his cycle, in addition to the ever-present variable of student satisfaction. The question of what method or instrument can most reliably gauge the success of technology integration rises to the fore. Teachers and students alike can benefit from the incorporation of technology into the classroom setting. A study of elementary school students from low socioeconomic backgrounds found that the use of classroom technology positively impacted students' sense of self-worth and led to greater classroom collaboration. John Dewey, an American educational theorist, once said, "If we teach today's students as we thought yesterday's, we rob them of tomorrow (Bledsoeas cited in (Bolliger, Supanakorn, & Boggs, 2010).

The educational landscape has changed in recent years. Nowadays, educators are tasked with a wider range of responsibilities than just imparting knowledge from textbooks. The current student population is often referred to as the "digital native" because they grew up with computers. Teaching staff satisfaction is a major issue (Linnenbrink & Pintrich, 2004; Toropova, Myrberg, & Johansson, 2021). In spite of progress, educators and administrators continue to fret over how to inspire their students. While there is no silver bullet, there are

tactics that can help educators navigate this difficult situation. Technology is one type of these methods because it can increase students' sense of accomplishment and make the classroom more fun and productive.

Student's satisfaction and Engagement

Satisfaction is defined as the state of mind that compels one to act or make progress toward a goal (Harmon-Jones, Harmon-Jones, & Price, 2013). Satisfaction among students was defined as their resilience, originality, and eagerness to teach (Harrell, 2021). Beliefs, goals, values, desires, needs, and emotions are just some of the many components that make up a person's level of satisfaction (Abushandi, 2021; Alexander, Murphy, & Kulikowich, 2008; Wentzel, 2012). "the enjoyment of school learning characterized by the direction of mastery, curiosity, persistence, self-task, and learning of difficult, difficult, and new tasks," Heyder, Weidinger, Cimpian, and Steinmayr (2020) writes. Student satisfaction is considered a crucial part of the learning experience because it has a positive relationship with the achievement of distance learners (Hew, Hu, Qiao, & Tang, 2020). Researchers have found a link between students' levels of academic satisfaction and their ability to learn and maintain a healthy lifestyle (Camacho, Alves, & Boscolo, 2021; Núñez & León, 2015; Upadyaya & Salmela-Aro, 2013). Studies have also shown that a high level of student satisfaction correlates with academic achievement in an online classroom (Hsu, Wang, & Levesque-Bristol, 2019; Nelson, Oden, & Williams, 2019).

When asked what they found most challenging about distance learning, 39% of students cited a lack of "satisfaction." Many factors in the surrounding environment contribute to this dissatisfaction. In addition, students claimed they lacked motivation to study because they lacked access to the school's routines, consequences, resources, and peer support (Yates, Starkey, Egerton, & Flueggen, 2021). "Teachers who made use of online duration and communication tools (such as Google and Education Perfect) to provide one-on-one assistance to their students reported an uptick in motivation. Inspirational, too, were classrooms where "loads of resources that catered to a variety of learning preferences" were made available to students." Reference: (Yates et al., 2021). They will be less invested in their own education if they are not highly self-reliant. Negative feedback can have a devastating effect on a student's sense of worth, diminishing their motivation and making it much more difficult for them to achieve their goals. Without a doubt, encouraged students to chill out and get excited about the task at hand, as well as to feel like their efforts were worthwhile (Snyder, Carrig, & Linnenbrink-Garcia, 2021).

Educators in conventional settings have a responsibility to boost students' feelings of contentment from within. Intrinsic happiness can be attained through interest or curiosity (Woolfolk Hoy, Davis, & Anderman, 2013). The focus of extrinsic motivation is on external factors, such as grades, participation in extracurricular activities, and the promise of future rewards. Teachers can do a lot to boost student motivation by fostering an environment that encourages

innovative thinking. Teachers face a significant challenge in coming up with engaging and effective lessons for their students across a wide range of subject areas. Since they grew up with computers, smartphones, and the internet, digital natives are naturally adept at using technology to accomplish virtually any task (Sorrentino, 2021). Teachers are making deliberate efforts to incorporate technological tools into the learning process because students respond positively to technology and achieve effectively in a technological classroom environment. As the results show, the impact of cultural integration on students' motivation to learn English is smaller than the impact of technology integration on learning in the classroom during the COVID-19 outbreak (Ismail & Hamarsha, 2020). In the midst of the Corona virus outbreak, another study found that having students read books about species diversity in fish improved their satisfaction with their education (Yustina, Halim, & Mahadi, 2020). Resetting our educational system is long overdue, as one of the many lessons learned from the COVID-19 pandemic, (Code, Ralph, & Forde, 2022).

Technology integration and Student satisfaction and engagement

Following a thorough analysis of the existing literature, it is clear that classroom technology is an effective means to raise student interest in and participation in the learning process (Nedashkivska, 2023). Having a good teacher is obviously crucial to a child's development and future success (Gillham, Tucker, Parker, Wright, & Kargillis, 2015). Therefore, successful technology integration at any level requires substantial teacher training (McLaughlin et al., 2014). To add, modernizing the classroom with cutting-edge tech helps schools stay current, piques the interest of digital students, and better prepares them for the workplace of the twenty-first century (Kirkman, Bentley, Armitage, Wood-Bradley, & Woods, 2022). Educators need to consistently monitor student progress after implementing new technologies in order to determine how successful the implementation has been (Luo & Murray, 2018). Although research has shown that incorporating technology into the classroom can have a positive effect on students' education, it is still unclear what kind of technological integration will lead to what kinds of learning gains (Heaton, 2013). This calls for more quantitative data on what levels of technology integration lead to beneficial gains in student satisfaction and engagement, as was revealed by a review of recent research in technology integration specifically pertaining to initiatives.

Burns (2023), in their in-depth analysis of 1:1 initiatives, emphasized the need to go beyond substitution levels of technology integration, i.e., simply automating a previous practice. In particular, improved substitutions are more interesting; however, they do not always result in improvement (Burns, 2023). Even though a new car may have improved speed, gas mileage, the availability of a sunroof, and/or wireless connectivity via Bluetooth, its primary function, objective, and the results it produces remain the same as those of any other car:

namely, transporting its owner from point A to point B. In addition, the destination is set not by the car itself but by the driver. Therefore, if teachers are to be the drivers of technology integration and facilitate student usage in classrooms, they must be well-versed in both the mechanics of the vehicle and the route to the destination (Romrell, Kidder, & Wood, 2014). The area of knowledge where existing research is most at odds is our understanding of how much technological integration is optimal for leading students to the desired outcome of elevated levels of contentment and engagement (Heaton, 2013).

Information on teacher and student perceptions of technology use is widespread in the research community, but there is still little consensus on how technology integration affects student assessment results. Unfortunately, how students feel about technology does not correlate to how much they learn, how happy they are, or how engaged they are in their schoolwork (Valiente-Rocha & Lozano-Tello, 2010; Voinov & Senokosov, 2022). Twenty qualitative studies focused on teachers' and students' impressions of the benefits of technology in the classroom, five quantitative studies used a variety of technologies (including laptops and other touch-screen tablets) but found inconsistent learner gains, and five mixed-method studies combined usage frequency with teachers' and/or students' impressions of the benefits of technology in the classroom. The idea that putting technology into the hands of all students everywhere is just another tried quick fix for too many underachieving students gains traction without clear evidence of the learning gains that can be derived from the specific integration of technology in question (Kenny, 2013).

Technology adoption Model

Classroom instruction has been profoundly altered by the incorporation of technology (Boling, 2008). In order to aid their students and provide better learning opportunities, many teachers now incorporate technological tools into their classrooms. Universities in Australia, for instance, have been pushed to integrate technological tools into their curricula (Sawang, O'Connor, & Ali, 2017). Among these is the use of clickers or Key Pads, interactive student response systems. The Key Pad can be used with just three easy steps:

During the lecture, the instructor displays a question or problem and choices of answers; Previous research has shown that Key Pad is an effective tool for managing a large classroom (Ahmed & Opoku, 2022; Sawang et al., 2017). We implemented Key Pad technology into our classes to see if it would increase student engagement, armed with the simple technology and empirical proof of its effectiveness. To better understand what factors lead to successful technology adoption, we incorporated relevant findings from previous research into a comprehensive model of constructs and their relationships. Our framework is based on the UTAUT, which integrates the theory of reasoned action (TRA), the theory of planned behavior (TPB), and the technology acceptance model (TAM) PHAN, HO, and LE-HOANG (2020). Students' sense of agency in their own behavior was also

factored in as a predictor of whether or not they would adopt Key Pad use. See Figure 1 for a visual representation of our proposed model.

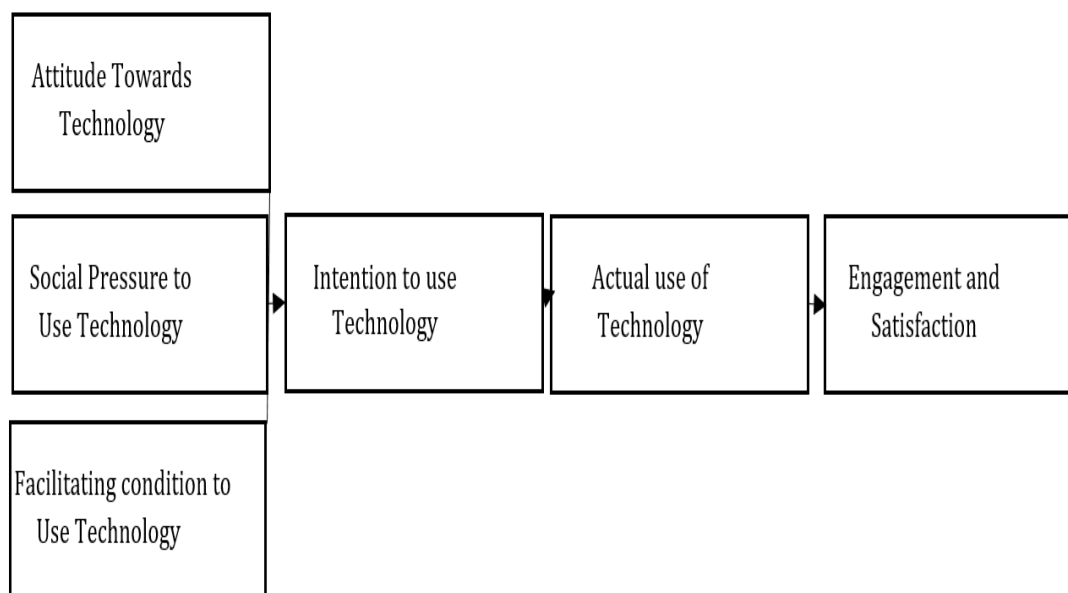


Figure.1: Proposed model for classroom-technology integration enhancing the students' engagement in a supersize classroom

Research Design

The purpose of this research is to investigate how incorporating technology into the classroom affects students' engagement and satisfaction. In order to accomplish this goal, a combination of techniques was used. Both qualitative and quantitative techniques were used in the study's research design. Twenty teachers, all of whom were experts in their respective fields, were interviewed. Each instructor was given a set of four questions to answer, and the transcripts of those answers were compiled. Since the respondents' names and areas of expertise were not recorded, the information remained private. The data was gathered via in-person interviews, which allowed the researchers to ask more in-depth questions and thus improve the quality of the study. In addition, the n=131 undergraduates who took part in the quantitative study were all enrolled in the same course at a university in Indonesia. Participants ranged in age from 16 to 36, with an average (mean) age of 18.3 years (SD = 2.9). Attitudes toward keypads, social influence to use keypads, conducive conditions for using keypads, and intentions to use keypads were all taken into account in the study. Survey items created by Venkatesh and Zhang (2010) were used in a self-report questionnaire to measure these factors. These items were originally developed to examine Key Pad acceptance and use according to Venkatesh and Zhang (2010) Unified Theory of Acceptance and Use of Technology (UTAUT), but were adapted for this research. The original "attitude" scale included a statement like "using the system is a good

idea," but we changed it to "using Key Pads in lectures is a good idea" for our survey. Participants were asked to rate each statement on a 5-point Likert scale from "strongly disagree" to "strongly agree." Table 1 is a summary of the questions included in the survey.

Table 1 Summary of variables and example statements in student questionnaire

| a. | attitude toward keypads | Using the keypads enhanced my interaction during the class. |
|----|-----------------------------------|---|
| b. | social influence to use keyboards | I used the keypads because of the proportion of classmates who used the system. |
| c. | facilitating condition | I was encouraged to try out the keypads. |
| d. | intention to use | I intend to use the keypads in my class. |

Data Analysis and Interpretation

Qualitative Analysis

The study's primary focus was on how much technology is used in classrooms. The topic was selected to help educators quantify the extent to which technology is being used to improve the classroom experience. Among the respondents profiles 53 percent respondents said nothing that technology integration is use in teaching learning process, 5 percent said low, 10 percent said moderate, 8 percent respondents said good, and 24 respondents said very good. According to the study's author, this finding can be explained by the fact that the school's budget is insufficient to provide technological tools for all classrooms, and since some classrooms have these tools while others do not, the study's author concludes that the local community does not adequately support the school financially in terms of the availability of its technological environment. The teachers who reported a low level of technology use attributed it, in the researcher's view, to a lack of training in its use, as well as to inefficiencies in its use brought on by the teachers' advanced years or their general disinterest in the field. The above discussed results are predicted in following Table.1 below and Figure.2.

Table.1: Degree of Integration of Technology in Teaching Learning Process

| Theme | Item | Percentage |
|--|-----------|------------|
| Degree of integration of technology in teaching-learning process | Nothing | 53 |
| | Low | 5 |
| | Moderate | 10 |
| | Good | 8 |
| | Very good | 24 |
| | | 100.0 |
| Source: Authors Estimation | | |

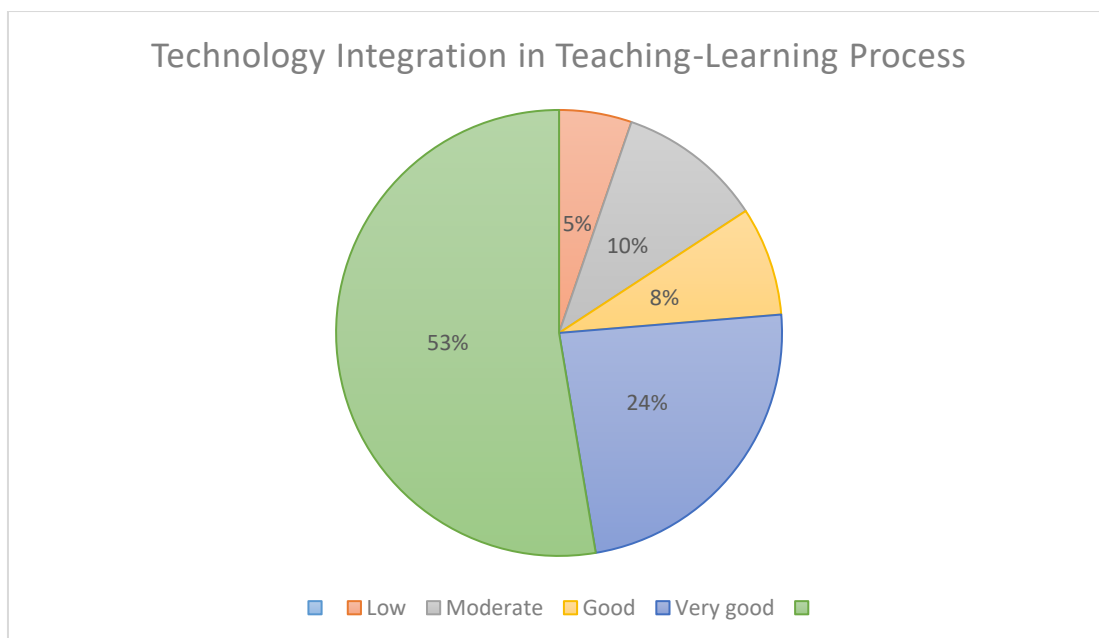


Figure.2: Technology integration in teaching learning process
 Source: Author’s Own Illustration

The second central idea was to examine how students' engagement and satisfaction changed after technology was introduced into the classroom. 50% of the responses fell into the category of "improves the students' level," "breaks the classroom routine," or "motivates students to learn," and 20% fell into the inspires students. However, only 5% felt it had no bearing on their students' ability to learn. The study's authors hypothesize that the ten participants' positive attitudes toward technology in the classroom are due to the fact that these participants employ techniques for using technology in the classroom that make learning and teaching more enjoyable and easy, and that remove students' psychological barriers to learning. This is due to the fact that education revolves around the individual student. All of the results are predicted in the following Table.2 and Figure.3 below.

Table.2: The effect of technology integration on student engagement and satisfactions

| | Item | Percentage |
|--|---------------------------|------------|
| The effect of technology integration on student engagement and satisfactions | Improving students' level | 51 |
| | Breach classroom routine | 24 |
| | Inspire students | 20 |
| | Nothing | 5 |
| Source: Authors Estimation | | |

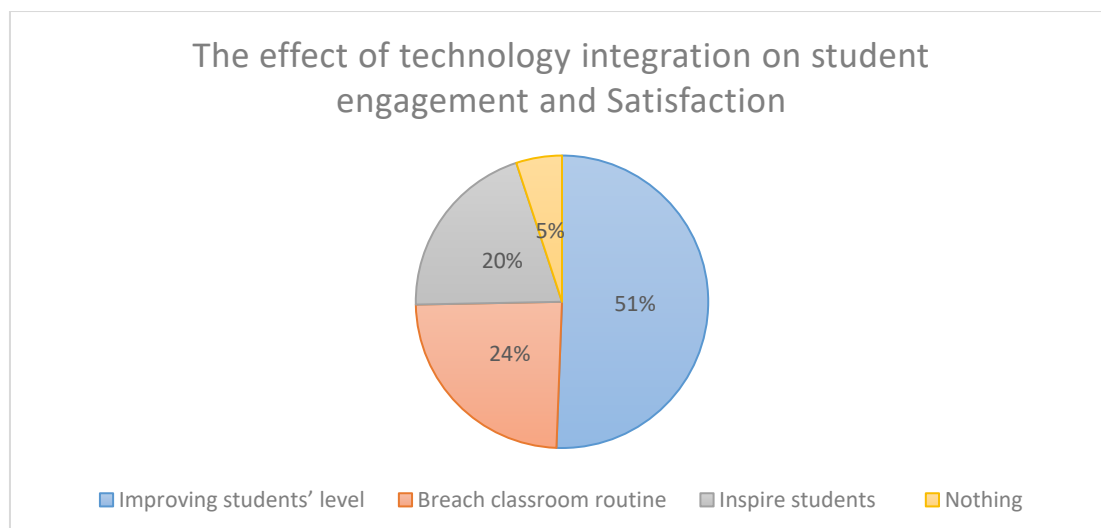


Figure.3: The effect of technology integration on student engagement and satisfactions

Source: Authors Own Illustration

Further results indicate that educators cite a lack of resources (such as devices, internet access, and expertise) as the root cause of the problems they face. The response rate of 50% indicates that they do not have enough devices, as only 20 people filled out the survey. Twelve people (30%) responded that they have internet connectivity issues, and eight people (20%) responded that they lack sufficient proficiency. Therefore, the researcher concludes that the lack of a suitable classroom environment in terms of classroom size and overcrowding students and the lack of strong Internet lines that suit the technological learning programs are the main reasons why the tools of learning technology are not enough to generalize all classes, disciplines, and students. The researcher found that the teachers' consensus that technology integration affects students' satisfaction can be attributed, in part, to teachers' participation in training courses for the use of technology in education, and, in part, to the nature of their specialties, such as English, Mathematics, and Arabic, which lend themselves well to the use of technology. When asked about the reasons why they disagreed, teachers often cited a lack of familiarity with educational technology and inadequate exposure to technology-based professional development opportunities. The above discussed results are predicted in the following Table.3 below.

Table.3: Obstacles of technology integration in teaching learning process

| | Items | Percentage |
|---|--------------------------|------------|
| Technology integration obstacles in teaching learning process | Internet problem | 30 |
| | insufficient devices | 50 |
| | inadequate proficiencies | 20 |

Source: Authors Estimation

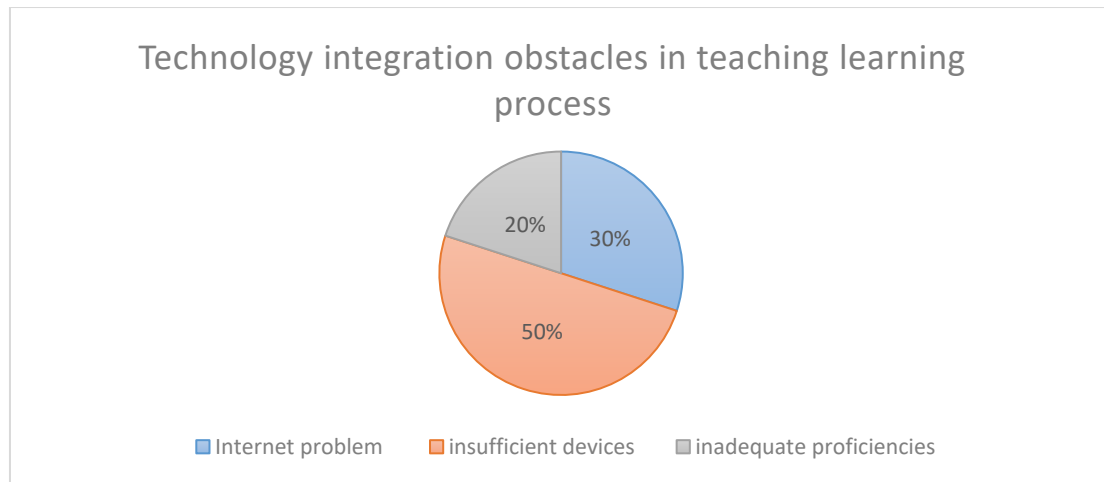


Figure.4: Technology integration obstacles in teaching learning process
 Source: Authors Own Illustration

Quantitative Analysis

Figure 5 shows how the data backed up most of the hypothesized pathways. Those who had a favorable impression of Key Pads and who felt peer pressure to adopt the technology had higher adoption intentions. Furthermore, there was a moderately positive correlation between prior intent to use Key Pads and actual use, as predicted. Students who used Key Pads during lectures were more invested in what was being taught than those who did not. Several significant mediated effects were also found. Indirect effect = 0.19, $p < 0.05$) and attitude (indirect effect = 0.21, $p < 0.05$) were both found to be significant indirect predictors of actual use. This means that attitudes and social pressures surrounding the use of Key Pads have an impact on how often they are actually used. The Theory of Predicted Behavior agrees with this. No evidence was found to back up the last hypothesis. There was no interaction between extroversion and the prediction of Key Pad use amongst students. On the other hand, a small negative correlation was found between extraversion and engagement (independent of Key Pad use). This may be because the subject is more reflective and therefore more likely to attract introverted readers. The above results are predicted in following Figure.5 below.

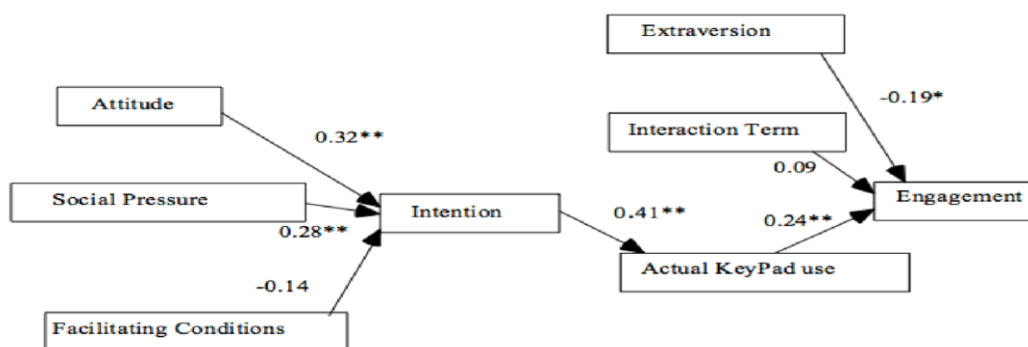


Figure.5: Technology and engagement

Discussion and Conclusion

In the words of McLaughlin et al. (2014), "Integrating technology is no longer a choice. It has become too prevalent in the jobs students are being prepared to seek in the 21st century workplace". According to Swayne (2017), in the last 20 years, we have built a massive body of knowledge and incredible tools to allow anyone to access it from anywhere at any time. It has transformed every industry. It has effect to students, teachers, and educational institutions around the world (Almanthari, Maulina, & Bruce, 2020). Teachers' responses were analyzed, and those analyses were then applied directly to the study's aims. Results from both qualitative and quantitative analyses show that incorporating technology into the classroom increases both student satisfaction and engagement, and that students respond positively to technology-infused activities due to their prior experience with and comfort with such tools (Atkinson et al., 2000). It's a great way to put students' knowledge of technology to use in the classroom, which in turn can help them earn real money. Students' needs and interests are accommodated through the use of technology in the classroom. If the goal of education is to foster long-term memory retention, then technological advancements play an important role in this regard. Interviews with teachers who teach in a variety of specializations and an analysis of their responses reveal that incorporating technology effectively increases student satisfaction and participation. Macfadyen and Dawson (2012), Downes and Bishop (2012), Martinez and Schilling (2010), and 'Technology in Education' (2015) all found that students were more engaged and satisfied with their education when given access to technological resources and encouraged to design meaningful learning activities. Therefore, the researcher concludes that technology has a significant effect on the learning-teaching process in terms of student satisfaction and engagement, particularly among those students who are interested in it. This study found that incorporating technology into the classroom not only breaks up the monotony of school, but also positively affects students' innate talents. In the first place, students need to enjoy and benefit from the use of the technology. The study's findings revealed that teachers with varying areas of expertise have different perspectives on the extent to which technology is integrated at Indonesia girls School, how it has affected student satisfaction and engagement, and what challenges are encountered when attempting to use technology in the classroom, such as the inadequacy of the available network and the quality of the technological devices.

Implications and Recommendations

If the level of technology integration was appropriate and substantial, the current study would contribute to the argument that technology is a valid tool that can be used to boost student engagement and achievement. More opportunities to educate them arise as student interest grows (Comas-Quinn, Mardomingo, &

Valentine, 2009). Students are more invested in their learning and more satisfied with their classroom experiences when technology is used to accomplish goals that were previously impossible (Puentedura, 2014). As a result, the purpose of this research was to identify the optimal degree of technological integration for maximizing student motivation and retention, both of which are correlated with higher levels of learning outcomes. Both qualitative and quantitative research found that greater levels of technology integration increased student engagement. Both the theory and practice of technology integration increasing student achievement are called into question by the findings of the present study, which provide support for the theory validating the use of technology integration for positive impacts in classrooms. As a result of these findings, the current study is regarded as a pioneering study because it contributes to the existing body of literature with its extensive results from both a qualitative and quantitative perspective. To ensure that regulatory bodies are aware of the importance of technology in raising student engagement and satisfaction, the study also provides this information to the public.

The findings of the current study also point to the need for additional studies to be conducted in order to provide quantitative evidence showing which levels of technology integration maximize student engagement and satisfaction. The results of the current study could be strengthened and supplemented by conducting a similar investigation over a longer time period, in several different institutional districts, at additional grade levels, with additional subject matter, and with a different kind of assessment to gauge student achievement. In a longer-term replication of the study, similarities between the levels of technology integration and student engagement might or might not have been stronger, but the validity of such comparisons would have increased due to a study with more observations. Therefore, future research could be conducted on other educational institutions. Moreover, the research was limited on Indonesia that is a developing nation, therefore, future research could be conducted on other developed economies to know about the variations in the results which could increase the research generalizability.

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