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## THE EFFECTS OF TECHNOLOGY UTILIZATION IN THE LEARNING PROCESS ON STUDENTS' PSYCHOLOGICAL WELL-BEING: THE PERSPECTIVES OF CONSTRUCTIVISM THEORY

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**Abstract.** This research aims to make a significant contribution to the understanding of constructivism in the context of education through an in-depth exploration of the use of technology in the learning process and its impact on the psychological well-being of students. The study employs a quantitative approach, utilizing structural equation modeling (SEM) and Partial Least Square (PLS) for analysis. The research participants consist of 100 university students in Malang, Indonesia, selected to complete an online questionnaire. The study results indicate that the integration of technology into the learning process has a positive and significant impact on students' psychological well-being. The application of constructivism theory as a conceptual foundation for understanding the influence of technology in learning demonstrates that students' interactive role in constructing knowledge has a substantial effect. The use of various platforms such as Google Drive, Google Docs, Microsoft Office, Zoom, Google Meet, Canvas, Moodle, Grammarly, and Mendeley creates a learning context that facilitates collaboration, active participation, and the development of students' social skills. In the context of students' mental well-being, technology helps alleviate burdens by providing flexibility in completing tasks, stimulating a sense of connection through collaboration, and offering psychological support.

**Keywords:** Technology Utilization, Learning, Students' Psychological Well-being, Constructivism Theory

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### I. INTRODUCTION

In recent times, the advancement of information technology has permeated various aspects of life, including the realm of education (Fauzi et al., 2023). The integration of technology in the learning process across various educational institutions, from elementary schools to universities, has become an inevitable phenomenon (Ausat et al., 2023). The use of technology in the context of learning encompasses the adoption of modern hardware and software, the utilization of digital learning applications, and engagement with online platforms that enable instant access to information (Ausat, 2022, 2023).

While technology has significantly contributed to improving efficiency and effectiveness in the learning process, questions about its impact on the psychological

well-being of students have become increasingly important. Changes in lifestyle and learning patterns resulting from the adoption of technology can have implications for psychological aspects, including stress levels, learning motivation, sleep quality, and students' social interactions.

Previous research has provided initial insights into the relationship between the use of technology in the learning context and the psychological well-being of students. (Vlachopoulos & Makri, 2017) conducted research focusing on the impact of digital games and simulations in achieving student learning objectives. The explored technology-based games are not limited to video games, virtual worlds, and Massive Multi-Player Online Games (MMPOGs). Overall, the study findings indicate that games and/or digital simulations have a positive effect on achieving learning objectives. When integrated into the learning process, the

researcher identified three types of learning outcomes: cognitive, behavioral, and affective. As a follow-up, the author summarizes this evidence to contribute to the academic understanding and practical application for higher education professionals interested in the effectiveness of using games and simulations for pedagogical purposes. These findings also provide alternatives and potential directions for future research.

(Wickramasinghe & A U Jayatilleke, 2021) conducted research on the influence of factors such as the use of smartphones, social media, the Internet, electronic devices, video games, and television watching on the psychological well-being of students in Sri Lanka. The main findings of this research indicate that the use of social media, Internet use, and television watching have a significant positive impact, while video game usage has a significant negative impact on psychological well-being. However, the use of smartphones and the use of devices did not have a significant impact on psychological well-being. Additionally, Internet use was identified as the most influential factor in the use of Information and Communication Technology (ICT), with the strongest predictive power for psychological well-being. The findings of this research are expected to benefit university students, parents, academic and non-academic staff, social media developers, mobile app developers, and television providers to respond appropriately to this emerging phenomenon. Meanwhile, (Asad et al., 2023) also investigated the relationship between technostressors and the psychological well-being of postgraduate students in Pakistan. The research findings indicate a weak relationship between technostressors and the psychological well-being of learners. Among the five interrelated technostressors, techno-insecurity has a moderate effect on the psychological well-being of learners.

Based on previous research that is not only inconsistent but also inadequate, there is a profound need to investigate the impact of varying technology usage, including intensive use or specific applications, on specific psychological aspects of students. In the context of the phenomenon occurring at the local level, particularly in Malang City, East Java, this research offers a unique approach when discussing the utilization of technology in the learning context. The impact of technology use in the learning process in Malang City is still unclear regarding its significance or lack thereof on the psychological well-being of students. The availability of flexible learning material access through online platforms allows for time adjustments and reduces stress related to schedules, while virtual interaction and collaboration through online discussions can enhance social engagement, reduce loneliness, and support psychological well-being. The use of learning tools, such as instructional videos and simulations, provides engaging elements in learning, enhances a sense of achievement, and has the potential to improve psychological well-being. However, on the flip side, there is technological stress, such as internet connection issues or other technical problems, which can cause additional stress; therefore, technical support and a balanced approach are necessary. During distance learning, the level

of uncertainty related to policy changes and adaptation to a new environment can affect the psychological well-being of students, emphasizing the importance of adequate support and guidance from educational institutions. Thus, wise management of technology in the learning context can have a significant positive impact on the psychological well-being of students in Malang City.

The theory adopted in this research to elucidate the utilization of technology in the learning process of students is constructivism. This theory emphasizes the active role of students in the learning process, where they actively construct their understanding through interaction with information and the learning environment (Piaget & Inhelder, 1967). In the context of the application of technology in the learning process, the principles of constructivism can be applied in the following ways:

1. *Knowledge Construction Through Interaction:* Students not only receive information but are also actively involved in constructing their knowledge. The use of technology can provide opportunities for students to explore information interactively through digital resources, simulations, and learning applications.
2. *Collaboration:* Constructivism emphasizes the importance of social interaction in learning. Technology enables collaboration among students, whether through online learning platforms, discussion forums, or collaborative projects, which can enhance understanding of concepts and enrich the learning experience.
3. *Meaningful Learning Context:* Constructivism emphasizes that learning is more effective when related to meaningful contexts for students. Technology can help create relevant and engaging learning situations, including interactive case studies, real-world simulations, and problem-based learning activities.
4. *Empowering Students:* In constructivism, students are considered active agents in their learning. Technology can give control to students in choosing learning resources, exploring topics according to their interests, and managing the pace of learning.

Technology and constructivism, two concepts that at first glance may seem separate, are actually closely intertwined in the modern learning context. Constructivism, as a learning theory that places students as active agents in the construction of their own understanding, has strong links with the use of technology in the learning process (Pourhosein Gilakjani et al., 2013). First of all, in constructivism, the importance of active learning is emphasized, where students are not only passive recipients of information, but also directly involved in constructing their own knowledge. Technology plays an important role in facilitating this active learning by providing easy access to various information resources, allowing students to explore topics independently and investigate complex concepts (Haleem et al., 2022). Furthermore, constructivism

emphasises the importance of students' interaction with their environment in building understanding. This is where technology plays a big role by expanding students' concept of environment through the internet and online platforms. Through technology, students can connect with various resources, collaborate with their peers, and engage in inquiry-centred learning.

It is important to emphasize that constructivism is not limited to the application of technology, but the use of technology can enrich the implementation of constructivist principles in the learning context (Vygotsky, 1980). Students who are actively engaged and have greater control over their learning process can experience positive impacts on their psychological well-being.

In connecting this research to the aforementioned background discussion, we will explore several common technologies typically used by students as research hypotheses. This is due to the potential use of various technologies by students in the learning process, where technology choices may vary depending on personal needs, field of study, and individual preferences. In the learning process, the utilization of Google Drive and Google Docs can enhance collaboration and student participation in group assignments, increase a sense of ownership of the learning process, and strengthen social engagement (Ali, 2021), which, in turn, may contribute positively to psychological well-being. However, some students may experience stress related to technology use. Those who are less experienced or have limited access to devices and the internet may feel left behind or face difficulties in participating in learning that involves online platforms.

In the learning context, Microsoft Office 365 also provides a range of collaboration tools, such as Microsoft Teams, Word, Excel, and PowerPoint, which can enhance student engagement in group tasks and collaborative projects. Although this engagement has the potential for positive impacts on psychological well-being, the use of digital collaboration tools like Microsoft Teams or various Office applications can also impose additional burdens on students, especially those unfamiliar with such technology (Morrison-Smith & Ruiz, 2020). This can create cognitive and technological stress, potentially affecting psychological well-being.

Additionally, platforms such as Zoom and Google Meet allow direct interaction between students and lecturers or fellow students, fostering engagement and social connection (Dantes et al., 2022). This can enhance students' sense of involvement and potentially contribute to their psychological well-being through a more active and interactive learning experience. However, it is important to note that excessive interaction through video conferencing platforms can lead to fatigue and exhaustion, commonly known as "Zoom fatigue." Increased frequency of online meetings and prolonged screen time can create mental and emotional fatigue, negatively impacting students' psychological well-being.

Students also frequently use technologies like Canvas and Moodle. They feel that these advanced platforms facilitate

easy and organized access to learning materials, assignments, and other resources (Persichitte et al., 2018). The availability of such access can reduce stress related to potential information loss and contribute positively to students' psychological well-being. However, excessive reliance on Canvas and Moodle can also have negative consequences. Students heavily dependent on these technologies may encounter difficulty or discomfort when transitioning to traditional learning methods if needed, potentially creating negative impacts on psychological well-being in the case of technical issues or system failures (Butnaru et al., 2021; Wang, 2023).

There is also Grammarly, a technology that helps students improve grammar, spelling, and writing structure. The application of Grammarly can enhance the quality of students' writing, provide satisfaction with the final results, and potentially improve psychological well-being (Yurika et al., 2023). However, excessive use or reliance on Grammarly as the sole source of writing feedback can create dependency on automation tools. Students may depend on Grammarly for grammar and spelling corrections without understanding the basic concepts, hindering the development of independent writing skills.

Meanwhile, active engagement with Mendeley in the learning process has a significant impact on improving students' psychological well-being. Mendeley assists students in organizing and managing research references (Iskandar & Patak, 2019). The ability to save, group, and easily access references can reduce stress and anxiety related to research, as well as enhance students' psychological well-being. However, students heavily reliant on Mendeley or similar reference management tools may have limitations in manually organizing references or understanding the basics of reference management. Such dependence has the potential to hinder students' ability to develop independent research management skills (Aprianti et al., 2022).

Examining the review of the impact of technology in the learning process above, both positive and negative effects are found. Therefore, through an in-depth exploration of the use of technology in the learning process and its impact on the psychological well-being of students, this research aims to make a significant contribution to the understanding of constructivism in an educational context. The primary focus of this research is to delve into the constructivist perspective and how its application in the use of technology in learning can shape students' perceptions and learning experiences. The anticipation from this research is to provide valuable insights that can inform educational policies and develop programs that promote a constructivist approach to integrating technology among students. This study is conducted through data collection by distributing questionnaires to students in Malang City involved in the use of technology in learning. The constructivist approach is chosen to ensure a profound understanding of how students actively construct their knowledge through interaction with learning technology. This research also aims to introduce various concepts in constructivist theory, such as collaborative learning and the construction of knowledge by

students through active learning experiences. Substantively, the main rationale of this research is to focus on how the use of technology in learning can be an effective constructivist tool, allowing students to construct their knowledge. By embracing a constructivist perspective, this research is expected to provide deep insight and a robust framework for understanding the impact of technology on the learning process and the psychological well-being of students more comprehensively.

## II. METHODS

This research adopts a quantitative approach, employing numerical and statistical methods in line with scholarly norms characterized by empirical, objective, measurable, rational, and methodical qualities, as outlined by (Igwenagu, 2016). The focus of this research is directed towards the domain of technology utilization in the learning process, with a specific emphasis on the psychological well-being of students, analyzed through the constructivist theoretical framework. In the constructivist theory paradigm, technology is interpreted as a tool that facilitates active, collaborative learning and knowledge construction by students. This research approach views technology as an exogenous variable influencing the learning environment and, ultimately, impacting the psychological well-being of students as an endogenous variable.

The incorporation of technology as an exogenous variable in this research is grounded in considerations aligned with constructivism principles. From a constructivist perspective, technology serves as a medium enabling students to interact actively with learning materials, collaborate with peers, and construct their understanding of the concepts being studied. The use of technology within the constructivist framework emphasizes the importance of interactive and collaborative learning experiences, stimulating critical thinking, problem-solving, and knowledge formation. Additionally, this research acknowledges the significance of viewing technology not just as a tool but as a facilitator of constructivist learning experiences. By exploring the extent to which technology utilization aligns with constructivist principles, this research aims to provide a deeper understanding of its impact on the psychological well-being of students.

The sample selection in this research is based on specific criteria such as academic year, gender, and program of study, implemented to ensure a diverse representation of students. This study specifically focuses on the student population in Malang City, recognizing the need to explore the relationship between technology, constructivism, and psychological well-being in this context. An online survey using Likert scales was conducted to collect responses from university students in Malang City during the period from November to December 2023. This is due to its wide accessibility. Online questionnaires can be accessed by respondents from anywhere as long as they have an internet connection. This allows researchers to reach a wider sample of respondents geographically, not limited to local or regional boundaries. In addition, when compared to paper

questionnaires, the use of online questionnaires allows researchers to collect data more quickly. The distribution and collection process can be automated, saving time and effort for the researcher. This means that using online questionnaires in research can provide many practical and methodological advantages for researchers, allowing them to conduct research more efficiently, effectively and affordably.

Data collected from 100 respondents were analyzed using the Structural Equation Model-Partial Least Squares (SEM-PLS) method with the assistance of SmartPLS 3.2 software. SEM-PLS analysis involves two categories of different relationships: the outer model covering convergent validity, discriminant validity, and reliability evaluations. Furthermore, the assessment of the model fit can be conducted by analyzing R-square, Q-square, and hypothesis testing. This approach allows for an in-depth examination of the relationships between technology utilization, constructivist learning experiences, and the psychological well-being of students.

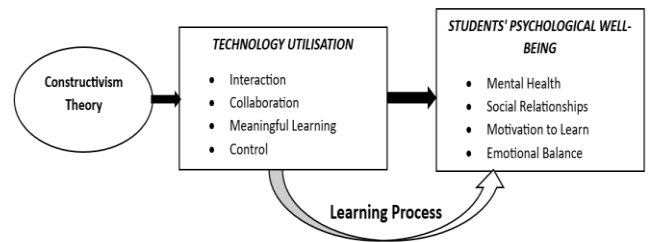


Fig 1. Research Framework

TABLE 1  
 CHARACTERISTICS OF RESPONDENTS

	Demographic	Frequency	Percentage	
<b>Institution</b>	Universitas Brawijaya	42	42%	
	UIN Malang	9	9%	
	Universitas Negeri Malang	8	8%	
	Universitas Merdeka Malang	9	9%	
	Politeknik Negeri Malang	21	21%	
	Universitas Muhammadiyah	10	10%	
	Total	100	100%	
	<b>Year Class</b>	2020	6	6%
		2021	49	49%
2022		25	25%	
2023		20	20%	
Total		100	100%	
<b>Gender</b>	Male	51	51%	
	Female	49	49%	
	Total	100	100%	
<b>Age</b>	17-23 years	81	81%	
	24-30 years	19	19%	
	31-37 years	0	0%	
	>37 years	0	0%	
	Total	100	100%	
<b>Frequently used apps</b>	Google Drive & Google Docs	5	5%	
	Microsoft Office	31	31%	
	Zoom & Google Meet	30	30%	
	Canvas & Moodle	16	16%	

	Grammarly	8	8%
	Mendeley	10	10%
	Total	100	100%
<b>Subject</b>	Business	38	38%
	Administration		
	Public	18	18%
	Administration		
	Entrepreneurship	26	26%
	Accounting	2	2%
	Management	16	16%
<b>Location</b>	Malang	100	100%

The data presented in Table 1 outlines the profile characteristics of the 100 respondents selected as subjects for this research. Among the participants, 51 were identified as male, while 49 were identified as female. Concerning the year of university enrollment, the distribution of respondents shows that six started their studies in 2020, 49 in 2021, 25 in 2022, and 20 in 2023. These respondents come from various study programs, with 38 individuals from the Business Administration program, 18 from the Public Administration program, 26 from the Entrepreneurship program, 2 from the Accounting program, and 16 respondents from the Management program. These results indicate that students in the Business Administration program tend to show a greater interest in utilizing technology during the education and learning process, demonstrating a higher need for academic achievement. Furthermore, the most widely used learning technology application among students is Microsoft Office. Regarding campus location, all 100 respondents are from campuses located in the city of Malang, reflecting the alignment of this research with the established sample study criteria.

### III. RESULT AND DISCUSSION

In this section the author will present the results of research data calculations which include the outer model and inner model.

#### A. Outer Model

By applying tests for convergent validity, discriminant validity, and reliability, this research demonstrates the preliminary stages in the analysis of the Structural Equation Model based on Partial Least Squares (SEM-PLS), involving the testing of the outer model.

- *Convergent Validity*

The concept reflecting a significant relationship between two or more dimensions of constructs (indicators) is expressed with the assumption that the factor loading values for each underlying manifestation variable of the construct should exceed 0.70 (Hair et al., 2011; Sutrisno et al., 2023). Through the application of convergent validity tests using SmartPLS 3.2.9, the test results indicate that the validity of reflective indicators is acceptable. All construct indicators presented in Table 2 show factor loading values above 0.70, reflecting the applicability and convergent validity in line with the research findings.

- *Discriminant Validity*

This was tested by comparing the correlation between constructs with the square root of the Average Variance

Extracted (AVE). According to the discriminant validity standards proposed by (Atrup et al., 2023; Hair et al., 2011), an instrument is considered valid if its AVE square values exceed the correlation between the respective constructs. The findings, as depicted in Table 3, provide concrete support for the validity of this model.

TABLE 2  
MEASUREMENT MODEL ANALYSIS

Variable	Item	Factor Loading	Cronbach's Alpha	Composite Reliability	AVE
<b>Technology Utilization (X1)</b>	X1.1	0,728	0,742	0,774	0,655
	X1.2	0,739			
	X1.3	0,866			
	X1.4	0,841			
<b>Students' Psychological Well-being (Y1)</b>	Y1.1	0,820	0,744	0,709	0,628
	Y1.2	0,703			
	Y1.3	0,712			
	Y1.4	0,880			

TABLE 3  
DISCRIMINANT VALIDITY

Var/Ind	X1	Y1
<b>X1.1</b>	<b>0,710</b>	0,443
<b>X1.2</b>	<b>0,890</b>	0,591
<b>X1.3</b>	<b>0,863</b>	0,517
<b>X1.4</b>	<b>0,756</b>	0,505
<b>Y1.1</b>	0,573	<b>0,791</b>
<b>Y1.2</b>	0,601	<b>0,832</b>
<b>Y1.3</b>	0,596	<b>0,778</b>
<b>Y1.4</b>	0,433	<b>0,729</b>

#### B. Inner Model

This research outlines the procedural steps involved in the analysis of the Structural Equation Model with Partial Least Squares (SEM-PLS), with a focus on model assessment through the examination of R-squared, Q-squared, and hypothesis testing.

- *R-square*

The use of the R-square metric is implemented to measure the extent of the contribution of exogenous constructs to endogenous constructs. The summary of the R-square analysis is briefly presented in Table 4 below. The R-square value reaches 0.573. Therefore, the technology utilization variable can explain approximately 57.3% of the variation in the student's psychological well-being variable, while about 32.7% of the remaining variation can be attributed to other factors beyond the scope of this research framework. Thus, following (Hair et al., 2011), the SEM model is considered to have moderate to strong power if the R<sup>2</sup> (R-square) value exceeds 0.50.

- *Q<sup>2</sup> Predictive Relevance*

The implementation of Q<sup>2</sup> serves as a diagnostic step to confirm the sustainability of the underlying structure, particularly focusing on Predictive Relevance. The suitability and predictability of the models are considered

acceptable when the  $Q^2$  value exceeds zero, in line with the views of (Hair et al., 2011). The formula determining the calculation of  $Q^2$  is formulated as follows:

$$Q^2 = 1 - (1 - R^2)$$

$$Q^2 = 1 - (1 - 0,573)$$

$$Q^2 = 1 - 0,427$$

$$Q^2 = 0,537$$

The obtained  $Q^2$  exhibits a numerical value of 0.573. The assessment of model proficiency and the accuracy of parameter estimation can be conducted by carefully scrutinizing the  $Q^2$  value, as elucidated by (Hair et al., 2011).

• *Hypothesis testing*

The statement is crafted to depict a positive correlation when the path coefficient exceeds 0.1 and attains statistical significance with a P-value less than 0.05 or a T-value surpassing 1.96, following the criteria established by (Hair et al., 2011). The outcomes of the hypothesis testing are outlined in Table 5 below.

TABLE 4  
R-SQUARE TEST

No	Variable	R-Square
1	Y1	0,573

TABLE 5  
HYPOTHESIS TESTING RESULTS

Hypothesis	Path Coefficient	T-Value	P-Value	Result
X1->Y1	0,237	6,194	0,005	Positive Significant

C. *Discussion*

The attached fifth table presents the research findings demonstrating the positive and significant impact of technology utilization in the learning process on the psychological well-being of students. These findings consistently support the first hypothesis put forward. This conclusion aligns with previous research that also revealed similar phenomena, as found by (Aryani et al., 2020). Contextual explanation in this regard is reinforced by the perspective of constructivism theory, emphasizing the active role of students in the learning process. Students are expected to actively construct their understanding through interaction with information and the learning environment. Therefore, the following is an elaboration on the principles underlying constructivism theory, as well as the positive impact of technology utilization in the learning process on the psychological well-being of students.

The utilization of technology, such as Google Drive, Google Docs, and Microsoft Office 365, in the context of the learning process, can be understood through the principles of constructivism theory that emphasize the role of active student interaction in knowledge construction. The dimension of knowledge construction through this interaction has a positive and significant impact, especially in student collaboration, enabling them to interact in real-time, share ideas, and collectively develop knowledge in the

same document. These platforms also support contextual learning by providing flexibility in document access and storage, giving students up-to-date access, and facilitating the integration of various information sources. The significance of active student participation is reinforced by features such as comments and feedback, providing opportunities for self-reflection and knowledge development (Ginting, 2021). Improved learning efficiency is reflected through easy access and integration with other applications, supporting time and resource efficiency (Montenegro-Rueda et al., 2023). In the context of students' mental well-being, this technology provides psychological support by offering flexibility in completing tasks, reducing student pressure, and stimulating a sense of connection through team collaboration. Integration with productivity tools also contributes positively to stress management and overall psychological well-being. Thus, the utilization of technology in the learning context not only enhances the learning experience but also strengthens positive aspects of students' mental well-being.

The collaborative dimension within the constructivism framework has a positive and significant impact when manifested through the application of technology, especially platforms like Zoom and Google Meet. Both of these platforms enable real-time interaction between students and educators, creating a dynamic learning environment with opportunities for direct discussions and idea exchanges. The flexibility in terms of time and space acquired through the utilization of this technology overcomes geographical constraints, opening up possibilities for global collaboration and cultural exchange in the context of the learning process (Rautenbach & Black-Hughes, 2012). The team collaboration and collaborative project features in Google Meet also encourage students to collaborate in a virtual environment, thereby developing social skills and the ability to work together. In addition to providing a more interactive learning experience, interactions through Zoom and Google Meet play a crucial role in shaping students' social engagement (Almusaed et al., 2023; Sivakumar et al., 2023). Group discussions through both platforms not only facilitate active student participation but also build a sense of community, contributing to their psychological well-being. In the context of social relationships, this technology serves not only as a medium for information exchange but also as a space to provide emotional support among members of the learning community. Therefore, the utilization of Zoom and Google Meet technology not only creates new ways of learning but also shapes an inclusive environment that supports social growth and the psychological well-being of students.

The Meaningful Learning Context dimension, found within the constructivism theory paradigm, produces a positive and significant impact when applied through technology, particularly on platforms like Canvas and Moodle. The contextualized delivery of learning enables teachers to create a relevant and meaningful learning environment, thereby enhancing students' motivation to participate actively (Prastuti et al., 2020; Subhan Roza et al.,

2019). By utilizing Canvas and Moodle, accessibility to learning materials is improved, providing flexibility for students to arrange their learning time and location according to their preferences, ultimately boosting learning motivation. The interactive and engaging Moodle platform presents features such as discussion forums and other online activities, creating opportunities for student participation and collaboration, and positively impacting learning motivation. Providing constructive feedback through both platforms can also enhance student motivation by offering clear guidance for development. The use of technology in the assessment process actively involves students in monitoring their progress, providing additional incentives to enhance the quality of learning outcomes (Azad, 2023; Haleem et al., 2022). Moreover, the Canvas and Moodle platforms offer collaboration potential, enabling students to work together virtually, which can increase motivation through involvement in joint projects and idea exchange. The technological support provided by both platforms also contributes to the psychological well-being of students by creating a friendly learning environment and offering the necessary technical support and resources. The alignment between the Meaningful Learning Context dimension and student motivation to learn through technology forms a solid foundation to support the psychological well-being of students in the digital learning era.

The Student Empowerment dimension, found within the constructivism theory, demonstrates a positive and significant impact when implemented through the utilization of technology, especially using platforms like Grammarly and Mendeley. Through Grammarly, students are empowered to enhance their writing skills by receiving improvement suggestions, which, in turn, build confidence and create emotional balance related to their writing skills (Sulistyowati, 2021). Additionally, Mendeley provides control to students in managing literature and references, facilitating the organization of reading materials, and reducing stress related to academic tasks, contributing to their emotional balance. The ability to customize Grammarly and Mendeley according to students' preferences and needs enhances personalized learning, reinforces students' control over their learning process, and supports emotional balance (Bachri & Lonik, 2022). The constructive feedback provided by both platforms not only helps improve students' academic skills but also plays a significant role in maintaining their motivation and emotional balance when facing learning challenges. The ease of access and use provided by these platforms creates a seamless learning experience, supporting students' emotional balance. Meanwhile, collaboration and social learning through Mendeley strengthen social connections and peer support. Thus, the utilization of Grammarly and Mendeley forms a strong foundation to enhance the psychological well-being of students through the Student Empowerment dimension within the constructivism framework.

The utilization of technology in the context of the learning process, involving tools such as Google Drive, Google Docs, Microsoft Office 365, Zoom, Google Meet, Canvas, Moodle,

Grammarly, and Mendeley, has been identified as a significant and positive predictor of students' psychological well-being. The research findings indicate that technology plays a crucial role in enhancing the psychological well-being of students, aligning with the principles of constructivism that emphasize active student engagement in the learning process. In this framework, technology not only improves the learning experience but also reinforces positive aspects of students' mental well-being. From knowledge construction through interaction to collaboration, meaningful learning contexts, and providing control to students, technology opens new opportunities to support these dimensions, creating an inclusive, dynamic learning environment that fosters holistic student growth in the digital learning era.

Technology has become an inseparable part of our lives, and its utilization can have significant positive impacts on psychological well-being. Through various applications and platforms, technology plays a crucial role in enhancing individual mental health. For instance, meditation and mindfulness apps aid in stress and anxiety management, while online therapy expands access to psychological assistance. Moreover, technology facilitates meaningful social interactions even in digital forms. Social media enables us to stay connected with loved ones, even those far away geographically, providing essential social support for emotional well-being. In the realm of education, technology has transformed how we learn. Now, with online learning platforms and other digital resources, individuals can access information and acquire new skills more easily. Tailored learning approaches also enhance motivation to learn and achieve educational goals. Furthermore, technology aids in maintaining emotional balance. Sleep tracking apps help individuals monitor their sleep patterns, while resources for relaxation and entertainment such as music, podcasts, and games, assist in reducing stress and improving mood. However, it is crucial to remember that excessive or unhealthy technology use can also negatively impact psychological well-being. Therefore, it is wise to use technology responsibly and always maintain a healthy balance between the digital world and real-life experiences.

#### IV. CONCLUSIONS

Based on the previous discussion, it can be concluded that the integration of technology into the learning process has a positive and significant impact on students' psychological well-being. These findings consistently support the proposed hypotheses and align with previous research highlighting similar encouraging results. The application of constructivism as the conceptual basis for understanding the influence of technology in learning indicates that the interactive role of students in constructing knowledge has a significant effect. The use of various platforms such as Google Drive, Google Docs, Microsoft Office 365, Zoom, Google Meet, Canvas, Moodle, Grammarly, and Mendeley creates a learning context that facilitates collaboration, active participation, and the development of students' social skills. In the context of students' mental well-being, technology

helps alleviate burdens by providing flexibility in completing tasks, stimulating a sense of connection through collaboration, and offering psychological support. Interactions through Zoom and Google Meet platforms not only transform the learning environment but also shape an inclusive setting that supports social growth and students' psychological well-being. Furthermore, technologies like Grammarly and Mendeley empower students with control over managing their academic tasks, boosting confidence, and providing emotional support. Therefore, the main conclusion drawn is that the utilization of technology in the learning context, based on the principles of constructivism, not only enhances students' learning experiences but also positively influences various aspects of their psychological well-being.

The implications of this research findings are monumental, holding the potential to enrich student's learning experiences through the integration of technology grounded in the constructivist theory. The implementation of technology, such as Google Drive, Google Docs, Microsoft Office 365, Zoom, Google Meet, Canvas, Moodle, Grammarly, and Mendeley, has the potential to have a positive impact on students' psychological well-being. To maximize the benefits of utilizing technology in the learning process, it is recommended that educational institutions provide adequate training and technical support for both teachers and students. Educational programs should also incorporate the development of digital skills into the curriculum to support the effective implementation of technology. However, it must be acknowledged that the challenge of technology accessibility remains an issue, with the possibility of digital divides emerging. Therefore, efforts are needed to ensure that all students have equal access to the necessary hardware and internet connections. Periodic evaluations of technology implementation, identification of areas for improvement, and ongoing efforts are key factors in the success of integrating technology into the learning process. Educational technology companies are also expected to continue developing collaborative features in their platforms to support a higher-quality learning experience. Nevertheless, it is important to remember that complete dependence on technology can pose challenges in the event of technical disruptions or system failures. Hence, it is crucial to have emergency plans and alternative solutions that can be activated as needed. In line with the principle of individualization, the diverse learning styles of each student should be considered. Additionally, issues related to the security and privacy of students' data in the use of technology need attention, with the implementation of adequate measures to protect students' personal information. By recognizing these implications, providing appropriate recommendations, and understanding potential limitations, the utilization of technology in the learning process has the potential to serve as an effective tool for enhancing students' psychological well-being.

These findings indicate that the integration of technology in learning has a positive impact on students' well-being. The constructivism approach emphasises the interactive role of students in constructing knowledge. Educators can utilise

various platforms to create learning contexts that support collaboration and the development of students' social skills. In addition, technology helps reduce student burden and provides psychological support. This suggests that the utilisation of technology in learning, based on the principles of constructivism, can enhance students' learning experience and overall well-being.

Lastly, the suggestion for responding to research findings with only 100 participants is that while the study provides valuable insights, the generalizability of the findings may be limited due to the small sample size. It's important to interpret the findings carefully and consider these limitations. It's recommended to use a larger sample size in future research to enhance the statistical power and generalizability of the results. By expanding the sample base, we can be more confident in drawing conclusions that can be applied more broadly. Incorporating a greater demographic variation in the sample is also important. Although it may require more resources, the benefits in improving the external validity of the findings justify the investment.

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