

The Effect of Social Media Use and ICT Utilization on Student Learning Behavior and Learning Achievement

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Abstract

This study examines the influence of the use of social media (USM) and information and communication technology (ICT) on learning behavior and student achievement. In today's digital era, social media and ICT have become an integral part of everyday life, including in the context of education. The use of social media and ICT has changed the way students interact and learn. Some experts argue that social media and ICT can support a more active, constructive and collaborative learning process. However, there are also concerns that excessive use can disrupt learning behavior and reduce students' academic performance. This study collected data from 207 students from several universities in Jambi Province through a Google Form-based questionnaire. Data analysis was conducted using the Partial Least Squares Structural Equation Modeling (PLS- SEM) model to evaluate the relationship between the variables studied. The results showed that the use of social media and ICT has positive and negative impacts on students' learning behavior and learning achievement, depending on the way and intensity of use.

Keywords: social media, information and communication technology (ICT), learning behavior, learning achievement, university students, PLS-SEM

INTRODUCTION

In today's digital era, social media and information and communication technology (ICT) have become an important part of everyday life, including in education. The use of social media and information and communication technology (ICT) has changed the way students interact and learn. Some experts argue that social media and information and communication technology (ICT) can help students in learning. According to (Voogt & Roblin, 2012), technology can assist more active, constructive, collaborative and significant learning. They emphasize that the integration of technology in education allows students to access more diverse resources, collaborate with others, and develop critical and creative thinking skills. On the other hand, there are concerns that excessive use of social media and ICT can disrupt learning behavior and lower student achievement. According to (Junco, 2012b) excessive use of social media can lead to distraction and wasted study time. In addition (Kirschner & Karpinski, 2010) found that excessive social media use can have a negative impact on students' academic performance.

Some expert opinions also support the impact of the use of social media and the utilization of information and communication technology (ICT) on learning behavior and student achievement, including according (Anderson & Dron, 2011), explaining that different educational capitals, such as social constructivism and collaborative learning,

are supported by educational technologies such as social media and online collaborative tools. They argue that ICT allows students to engage more deeply with learning materials and with their peers, which in turn can improve their understanding and academic achievement. The same opinion is also conveyed by (Chen & Bryer, 2012), that the use of social media can help students collaborate and interact better. (Greenhow & Lewin, 2016) also said social media can build online learning communities and support informal learning. This opinion can also be supported by (Rashid & Asghar, 2016) who said the use of social media in learning can increase student engagement and their motivation to learn. Social media can be used for various learning resources and forming professional (Manca & Ranieri, 2016). The wise use of social media can also help students become better at developing digital literacy (Tess, 2013). (Cheston et al., 2013) found that that social media use among university students can have a good or bad impact on their academic performance, depending on how they use it. They proposed that educational institutions provide instruction and training to students on how to use social media wisely. (Larry D. et al., 2011) stated that excessive social media use can cause fatigue and sleep disturbances in college students. They found that students who use social media before bed tend to experience poor sleep quality, which can have a negative impact on their concentration and academic performance. In line with (Kuss & Griffiths, 2017), excessive social media use can have significant negative impacts, including increasing the risk of addiction and potentially damaging an individual's mental health. Their research highlights the importance of understanding social media overuse behavior in the context of individual mental health and well-being. In learning, according to (Gikas & Grant, 2013) with the effective use of information and communication technology (ICT), it can motivate students to learn so as to improve their academic performance. Through project-based and collaborative learning, ICT can increase student engagement. Digital tools such as discussion forums and collaborative software allow students to work together and improve their critical thinking skills (Zhu, 2006). Similarly, He highlighted the importance of learning design integrated with technology to achieve optimal results. With the utilization of information and communication technology (ICT), according to (Wang et al., 2012), students can better use information and communication technology. students can plan their study schedules, set task priorities, and ensure that they are on the right track with task management applications, digital calendars, and automatic reminders. Thus, ICT can improve academic productivity and efficiency. (Catalano, 2015) revealed that information and communication technology (ICT) can be used to improve access to education and digital learning resources. (Hrastinski & Aghaee, 2012) emphasized how information technology enables the integration of learning online and face-to-face, which allows for changes in learning methods and timing as well as greater access to educational resources.

Therefore, students are asked to be wise in using social media and utilizing information and communication technology (ICT), because according to (Turel & Serenko, 2012) found that technology addiction can lead to overuse of information technology and social media, which in turn can interfere with academic activities. They pointed out that technology addiction can make students unfocused and unable to complete academic tasks in a timely manner.

METHODOLOGY

Instrumentation

The questionnaire distributed consisted of a demographic scale which was according to name, gender, study program, faculty, and university origin. Instruments of social media usage (10 items), ICT utilization (10 items), learning behavior (10 items), and learning achievement (10 items). The literature study on the influence of social media use and ICT utilization on learning behavior and learning achievement assisted researchers in defining and analyzing the concepts that form the theoretical context of the study. The literature study also enabled the researcher to determine the appropriate tools and instruments to be used in the study, such as the measurement scale of how influential social media use and ICT utilization are on learning behavior and learning achievement. Thus, a deep understanding of the related literature can guide further stages of research to explore the influence of social media use and ICT utilization on learning behavior and learning achievement.

Data collection

The target population included students from six universities in Jambi Province. From the distribution of google form-based questionnaires (n. items = 35), 207 data were obtained from respondents, consisting of 127 female respondents and 80 male respondents. The measurement of the questionnaire was based on the recommendations of the literature review. The questionnaire consists of a Likert scale which is used to measure the attitudes, opinions and perceptions of a person or group of people about social phenomena (Noeraini & Sugiyono, 2016). The Likert scale describes the variables to be measured into variable indicators, which are then used as a starting point for forming instrument items, which can be in the form of questions or statements. The answers to each instrument item have gradations from very negative to very positive. All variables are designed on a five-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree).

Data Analysis

The use of PLS-SEM is a popular model for estimating path models with latent variables and their relationships, and allows researchers to simultaneously analyze relationships in complex models consisting of various constructs, indicator variables, and structural paths. According to (Hair et al., 2019), the statistical properties of the Partial Least Squares Structural Equation Modeling (PLS-SEM) model offer features that are highly relevant to the characteristics of the data and the model used. They emphasized that PLS-SEM has significant flexibility in handling complex data and models that require complicated path analysis. In addition, they noted that the selection of PLS-SEM as a primary method is often based on its ability to handle complex interactions between indicator and path variables, along with the limitations of small samples or variables that are not normally distributed. The tool predicts hypothesized associations using state-of-the-art methods such as PLS-POS, IPMA, and advanced bootstrapping processes. In turn, this can optimize the explained variation in the dependent variable. PLS-SEM analysis is applied through several stages. Evaluation of convergent and discriminative validity is the first step. Item load values, Cronbach's alpha, composite reliability, AVE, Fornell-

Larcker criterion, heterotrait-monotrait (HTMT) values, and multicollinearity evaluation through VIF values are all components of this evaluation (Henseler et al., 2015). These stages provide a solid foundation for structural analysis and advanced hypothesis testing using bootstrapping methods.

FINDINGS

Measurement Model

As shown in Figure 1, each variable is significantly affected by the loadings in the measurement model. When the average variance extracted (AVE), rho_A, and composite stability (CR) each exceed the recommended value, the indicator is loaded above 0,5 (Noor et al., 2019). To indicate good convergence validity, Table 1 shows AVE values between 0.622 and 0.696. In addition, reliability and internal construct consistency are indicated by rho_A and CR values (>0.700) (Sarstedt et al., 2016). VIF values were calculated to avoid multicollinearity. The VIF values shown in Table 1 indicate that the data does not have a problem with multicollinearity, multicollinearity. Furthermore, examination of the heterotrait-monotrait ratio (HTMT) showed values below 0.900 for discriminant validity assessment (Hair et al., 2019; Henseler et al., 2016). HTMT values that are distinct and below 0.900 indicate discriminant validity in the PLS-SEM procedure (Table 2). To assess model fit in this study, standardized residuals (SRMR) were used; this is the only appropriate model fit that can be used for PLS-SEM (Henseler et al., (2016). In addition, dG and dULS are suggested for assessing model fit; they are distance measures that relate in more than one way when measuring differences between matrices.

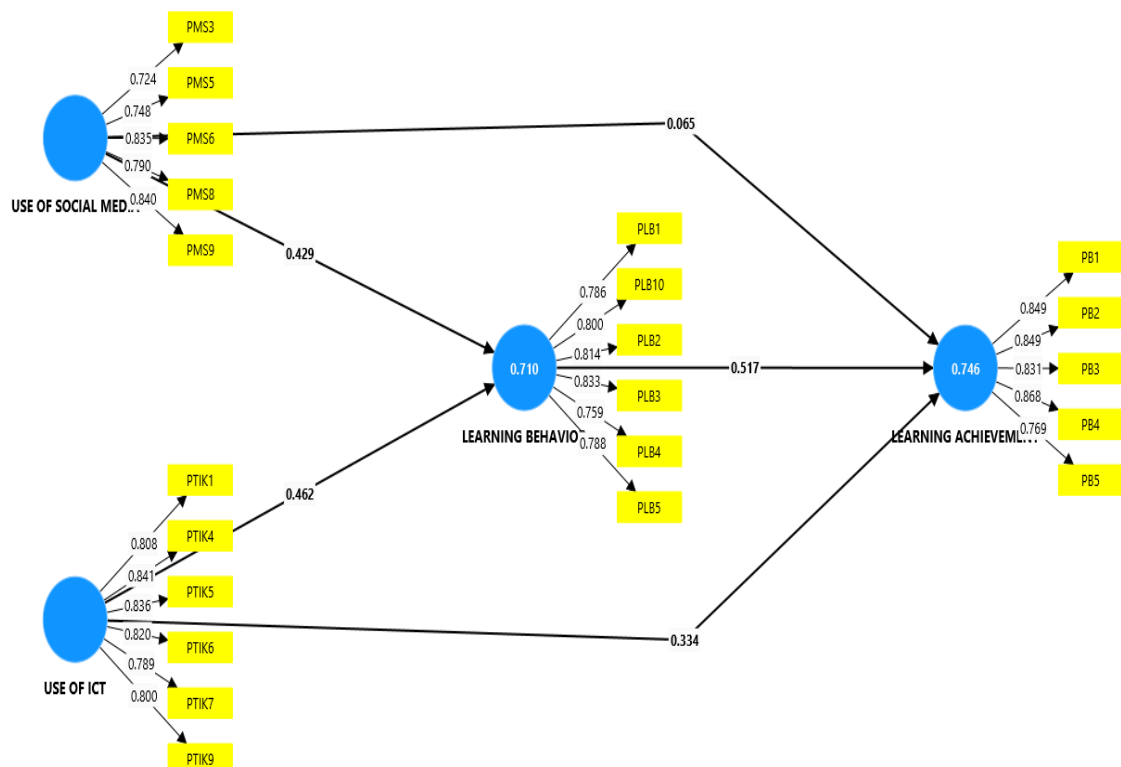


Figure 1. A measurement model that shows the substantial loading of the construction scale.

Table 1. Factor loading, reliability, and validity of measurement models.

Construct	Items	Loading	rho_A	CR	AVE	VIF
USM	USM3	0.724	0.851	0.891	0.622	1.559
	USM5	0.748				1.805
	USM6	0.835				2.053
	USM8	0.790				2.168
	USM9	0.840				2.455
UICT	UICT1	0.808	0.900	0.923	0.666	2.144
	UICT4	0.841				2.366
	UICT5	0.836				2.467
	UICT6	0.820				2.212
	UICT7	0.789				1.920
	UICT9	0.800				2.148
LB	LB1	0.786	0.886	0.913	0.635	1.896
	LB10	0.800				2.000
	LB2	0.814				2.205
	LB3	0.833				2.381
	LB4	0.759				1.751
	LB5	0.788				1.946
LA	LA1	0.849	0.890	0.919	0.696	2.472
	LA2	0.849				2.391
	LA3	0.831				2.144
	LA4	0.868				2.625
	LA5	0.769				1.721

Table 2. HTMT < 0,900 and model fit.

	LA	LB	USM	UICT	Saturated Model	
LA					SRMR	0.062
LB	0.800				d_ULS	0.981
USM	0.849	0.850			d_G	0.497
UICT	0.892	0.895	0.895			

Structural Model

Data were bootstrapped to investigate the relationship between exogenous and endogenous factors. We used a significance threshold of 5% (Table 3 and Figure 3). The results support H1; LB is a significant predictor for LA ($\beta = 0.517$; $t = 5.583$). Whereas H2; USM is an insignificant predictor for LA ($\beta = 0.065$; $t = 0.743$). The result of H3; USM is a significant predictor for LB ($\beta = 0.429$; $t = 4.369$). In addition, the result of H4; UICT is a significant predictor for PB ($\beta = 0.334$; $t = 3.841$). Similarly, the result of H5; UICT is a significant predictor for LB ($\beta = 0.462$; $t = 4.660$).

With a path coefficient (β) of 0.517 and a t-statistic value of 5.583 (greater than 1.96 at the 5% significance level), learning behavior (LB) has a positive and significant effect on student learning achievement (LA), as shown in Table 5. This result is in accordance with the opinion of (Rashid & Asghar, 2016), which states that student involvement in the learning process can improve their academic performance. In addition, learning behavior affects learning achievement significantly, as shown by the f^2 of 0.304.

Meanwhile, it was found that the use of social media (USM) did not have a significant influence on learning achievement (LA). With a path coefficient (β) of 0.065 and a t-statistic value of 0.743, the effect of social media on learning behavior (LB) is positive and significant, with a path coefficient (β) of 0.429 and a t-statistic value of 4.369, which is higher than 1.96. This result is in line with the opinion of (Rouis et al., 2011), which states that wise use of social media can help students be more engaged and collaborative in class, but excessive use can cause students to become unfocused and fail academically.

On the other hand, the use of information and communication technology (UICT) has a positive and significant impact on learning achievement (LA) with a path coefficient (β) of 0.334 and a t-statistic value of 3.841, each higher than 1.96. UICT also has a positive and significant impact on learning behavior (LB), with a path coefficient (β) of 0.334 and a t-statistic of 3.841, each higher than 1.96. 0.462 and t-statistic value of 4.660. This result is in line with the statement of (Gikas & Grant, 2013), which states that effective use of ICT in learning can encourage students to learn more and improve their academic performance.

In Figure 4, the coefficient of determination (R^2) is 0.540 for the learning achievement variable (LA) and 0.617 for the learning behavior variable (LB). Respectively, it shows that the proposed model can explain 54% of the variation in learning achievement and 61.7% of the variation in learning behavior. In addition, the

predictive relevance values (Q^2) of 0.346 for the learning achievement variable and 0.426 for the learning behavior variable indicate that the model has a fairly good predictive relevance.

H1: Learning Behavior (LB) has a positive effect on student Learning Achievement (LA)

In the world of higher education, learning behavior is an important component that can affect student learning outcomes in higher education institutions. Learning behavior shows how students participate, interact, and use successful learning strategies. Students' involvement in positive learning behaviors is believed to contribute to better learning achievement. According to (Vallerand, 2012) found that there is a correlation between strong intrinsic motivation and academic achievement. His research shows that students with high intrinsic motivation are more likely to show greater commitment to academic tasks, show deeper interest in the areas they study, and achieve better learning outcomes. They emphasize that students who feel intrinsically involved in learning activities tend to have greater motivation and achieve better academic performance. Student engagement in learning behavior This can include things such as class attendance, participation in discussions, use of learning resources, effective learning strategies, and management of study time. According to Reeve (2012), this view is supported by various studies, which show that actively involving students in the learning process can increase their intrinsic motivation and, consequently, improve their academic performance. This hypothesis is based on the idea that students who actively engage in positive learning behaviors such as participating in learning activities, managing time well, using effective learning strategies, and being emotionally and cognitively engaged in learning tend to have higher performance and better learning outcomes than students whose learning behaviors are lacking. Based on these opinions, it can be hypothesized that participation in learning behavior affects student learning outcomes.

H2: The use of Social Media (USM) affects student Learning Achievement (LA)

Social media has become an important part of everyday life, especially for university students. How social media use impacts students' academic performance is of great interest. Certain studies have investigated the relationship between social media engagement and college students' academic performance. (Junco, 2012b) conducted a study and found that there is a negative correlation between the amount of time spent on social media and students' average grade point average (GPA). The more time spent on social media, the less IP (Grade Point Average) value obtained. According to (Kirschner & Karpinski, 2010), the study of the influence of social media on students' academic activities and social interactions has become a significant focus of attention in educational psychology research. Their research highlights that social media use can have complex effects on students' academic achievement, with some studies showing a negative relationship between excessive social media use and academic performance, while others find that moderate use can have a neutral or even positive impact. They point out that while social media can help to cooperate and communicate, excessive use can lead to problems and poor learning outcomes. Conversely, research shows that social media can help students with learning if used correctly. According to (Boyd & Ellison, 2007), social

media can help cooperation and interaction that support education. Based on this research, a hypothesis can be developed that there is a relationship between social media usage engagement and student learning outcomes. The more students use social media for non-academic purposes, the worse their academic performance. Social media can help students learn better if used wisely to support academic activities, such as discussions, sharing learning resources, and working together.

H3: The use of Social Media (USM) affects the Learning Behavior (LB) of students

In today's technological era, social media has become an important part of everyday life, including education. Student engagement in social media use is an important component to consider in this regard. Engagement can be defined as the intensity of one's participation and constancy with a particular activity or object, according to Vivek et al., (2012). Engagement in social media use shows how actively students interact and engage with social media. Students' involvement in social media can affect their learning behavior (Junco, 2012b). According to (Junco, 2012a), the use of social media such as Facebook can help students cooperate and interact with each other in class, which can result in positive learning behavior. the use of social media such as Facebook can help students cooperate and interact with each other in class, which can result in positive learning behavior. (Manca & Ranieri, 2016), investigated the use of social media in higher education and found that they can help make learning more interactive and cooperative. According to them, social media allows students to share ideas, talk about lessons and work together on group projects. However, they also warned that unwise use of social media can lead to distraction and decreased productivity. Conversely, there are certain individuals who influence learning behavior. (Kirschner & Karpinski, 2010), stated that excessive use of social media can disrupt students' concentration and lead to unproductive learning behavior. Based on these opinions, it can be proposed that students' engagement in social media use will have an impact on their learning behavior. This hypothesis is based on the assumption that engagement in the use of social media can have a positive or negative impact on students' learning behavior, depending on the level and manner of social media use. Appropriate engagement can help students interact and work together, which helps them develop positive study behaviors. However, excessive engagement can lead to unfocused and unproductive studying

H4: Utilization of Information and Communication Technology (UICT) affects student learning achievement (LA)

Information and Communication Technology (ICT) has changed the world of education, including higher education. It is believed that the application of ICT in the educational process can improve the quality of learning and student academic achievement. The extent of the influence of the use of ICT on student academic achievement is still interesting to research. (Wang et al., 2012) conducted a study on how the use of information and communication technology (ICT) impacts learning in higher education and found that the application of technology can improve student engagement and learning outcomes. They emphasized that the application of ICT in the learning process such as e-learning and online collaborative tools can improve students'

interaction, understanding of concepts, and desire to learn. (Tamim et al., 2011) conducted a meta-analysis on how educational technology affects academic outcomes. They found that the use of information and communication technology (ICT) in education generally improves student learning outcomes. This is because technology enables the delivery of material that is more engaging, interactive, and can be customized to the unique needs of students. All of these contribute to improved student academic outcomes. Thus, this will inevitably improve student learning outcomes. On the other hand, research shows that inappropriate use of ICT can hinder academic outcomes. In their research, (Hattie & Group, 2009) stated that information technology (IT) has been shown to have great potential to improve the quality of education by encouraging collaborative and active learning. This research shows that the appropriate use of information technology can help students acquire critical thinking and problem-solving abilities, which are essential skills for academic success. But it also emphasizes that technology should be used in conjunction with good teaching strategies to achieve the best learning outcomes. Based on this research, a hypothesis can be made that there is a relationship between ICT engagement and student learning outcomes. The more students use ICT to support their academic activities, such as information seeking, collaborating, and using educational software, the better they learn. However, if used inappropriately or excessively, ICT use can hinder students' academic performance.

H5: Utilization of Information and Communication Technology (UICT) affects student Learning Behavior (LB)

In the modern era, information and communication technology (ICT) has become an important part of the learning process. ICT has created many new opportunities and new challenges in education, including the influence on students' learning behavior. In this context, an important element that must be considered is student engagement in the use of ICT. According to (Strayhorn, 2018) states that student engagement can be defined as active participation in a variety of academic and non-academic activities, both inside and outside the classroom and suggests that students' broad and diverse engagement affects their learning outcomes in addition to improving their social skills, their leadership skills, and their social connections, which are important components of their academic and personal success. Students' engagement in ICT use reflects how actively they use technology to assist their learning process. Students' learning behavior can be improved when they are involved in the use of ICT. According to (Gikas & Grant, 2013), the use of information and communication technology (ICT) in educational models such as virtual classes and e-learning can increase student engagement and their desire to learn. The concept of "digital natives", according to (Helsper & Eynon, 2010), suggests that the current generation of students grew up in an environment full of digital technology, which makes them very familiar and comfortable with the use of information and communication technology (ICT). Their research shows that adding information and communication technology (ICT) into the learning process can increase students' interest and motivation to learn. learning as they feel more connected and engaged in learning. However, there are also those who argue that inappropriate use of ICT can have an adverse impact on learning behavior. This hypothesis is based on the idea that engagement in ICT use can affect students' learning behavior positively or negatively,

depending on the level and manner of ICT use. Appropriate engagement can encourage positive learning behavior as it increases interest, motivation and involvement in the learning process. On the other hand, inappropriate engagement can disrupt concentration and reduce learning productivity.

Tabel 3. Structural model

H	Coefficient	β	t-Value	p-Value	f ²
H1	LB → LA	0.517	5.583	0.000	0,304
H2	USM → LA	0.065	0.743	0.457	0,005
H3	USM → LB	0.429	4.369	0.000	0,242
H4	UICT → LA	0.334	3.841	0.000	0,131
H5	UICT → LB	0.462	4.660	0.000	0,281

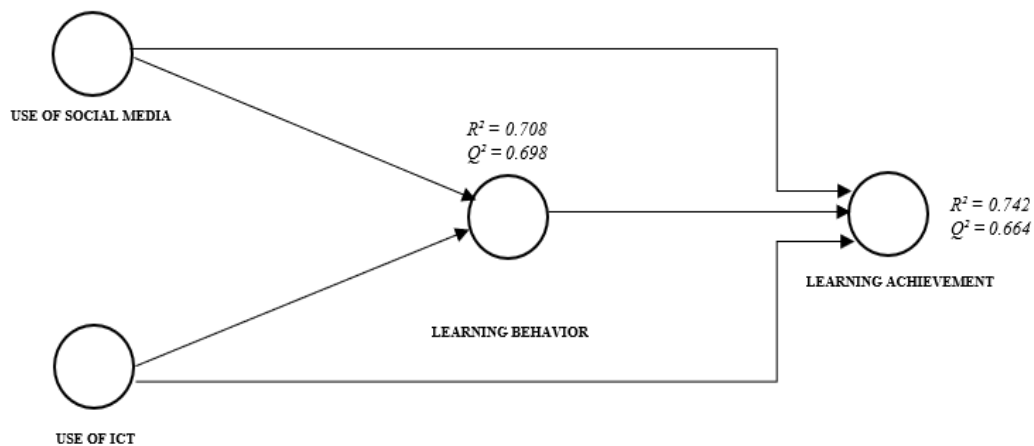


Figure 2. The *t-value*, coefficient of determination (R^2), dan predictive relevance (Q^2) of the final model

DISCUSSION

The results showed that learning behavior (LB) has a positive and significant influence on student learning achievement (LA). This is indicated by the path coefficient (β) value of 0.517 and the t-statistic value of 5.583, which is greater than the significance threshold of 1.96 at the 5% significance level. The opinion of (Rashid & Asghar, 2016) states that student involvement in the learning process can improve their achievement.

In addition, this study found that the use of social media (USM) does not have a significant influence on learning achievement (LA), with a path coefficient (β) of 0.065 and a t-statistic value of 0.743, indicating that the use of social media does not affect students' academic achievement directly. In contrast, USM has a positive and significant influence on learning behavior (LB), with a path coefficient value (β) of 0.429 and a t-statistic value of 4.369. This finding is in line with research (Rouis et al., 2011), which

states that wise use of social media can help students engage and collaborate more in class. However, excessive use can interfere with student focus and academic outcomes.

Utilization of information and communication technology (UICT) shows a positive and significant impact on learning achievement (LA), with a path coefficient (β) of 0.334 and a t-statistic value of 3,841. In addition, UICT shows a positive and significant impact on learning behavior (LB), with a path coefficient (β) of 0.462 and a t-statistic value of 4.660. This result is in line with the idea of (Gikas & Grant, 2013), which states that effective use of ICT in learning can encourage students to learn more and improve their academic performance. This result confirms that ICT should be incorporated into the learning process as it can increase student interaction and engagement, which in turn will result in better learning outcomes.

The model proposed in this study demonstrates good convergent validity, with average variance extracted (AVE) values between 0.622 and 0.696. In addition, rho_A and composite reliability (CR) values exceeding 0.700 indicate internal construct consistency and reliability. There is no multicollinearity problem in the data, according to the VIF values of which is low. The results of the discriminant validity assessment are also good, with a heterotrait- monotrait (HTMT) value of less than 0.900 Overall, the model shows a good fit; the standardized residual mean square root (SRMR), dG, and dULS values show a fair fit.

The coefficient of determination (R^2) of 0.540 for the learning achievement variable (LA) and 0.617 for the learning behavior variable (LB) shows that the proposed model is able to explain 54% variation in learning achievement and 61.7% variation in learning behavior. In addition, the predictive relevance value (Q^2) of 0.346 for the learning achievement variable and 0.426 for the learning behavior variable shows that the model has a fairly good predictive relevance. This shows that this model has sufficient power to predict student learning outcomes based on the variables studied.

The use of social media (USM) does not directly affect students' academic achievement, but has a positive impact on learning behavior (LB). Conversely, this study shows that learning behavior (LB) has a positive and significant influence on students' learning achievement (LA). It is proven that the utilization of information and communication technology (ICT) improves learning behavior and learning achievement. This research model is valid and reliable, and is able to predict the research variables. These results emphasize the importance of learning strategies that utilize technology and wise use of social media to support positive learning behaviors and better academic outcomes.

CONCLUSION

The research discussed in this article aims to examine the influence of social media use and the use of information and communication technology (ICT) on learning behavior and student achievement. In today's digital era, social media and ICT have become an integral part of everyday life, including in the context of education. The results show that the use of social media can have both positive and negative impacts. Judicious use of social media can increase student engagement and collaboration in the learning process. Students who use social media

for academic purposes tend to be more actively involved and work more collaboratively same, which in turn has a positive impact on their learning behavior. Conversely, excessive social media use can disrupt learning focus and concentration, resulting in lower academic performance.

Besides social media, ICT also plays an important role in learning. The utilization of ICT, such as virtual classrooms and e-learning, is proven to increase student engagement and their motivation to learn. ICT helps create connections between individuals, resources and information, which can enrich the learning experience and improve students' problem-solving and critical thinking skills. However, this research also highlights the digital divide that can affect academic performance. Not all students have equal access to technology, which can lead to differences in learning outcomes. From the analysis, it was found that learning behavior has a significant influence on students' academic performance. Students who have good learning behaviors tend to achieve higher academic performance. The use of social media, although not directly affecting learning achievement, contributes positively to learning behavior. Meanwhile, the use of ICT has a positive influence on both learning behavior and student achievement.

Overall, this study concludes that the use of social media and ICT in learning needs to be done wisely and in balance. Proper integration of these technologies can provide great benefits to students' learning behavior and achievement, but their uncontrolled use can have negative impacts. Therefore, it is important for students and educators to understand and manage the use of these technologies effectively.

REFERENCES

- Agustiah, D., Fauzi, T., & Ramadhani, E. (2020). The Impact of Social Media Use on Student Learning Behaviour. *ISLAMIC COUNSELING Journal of Islamic Counselling Guidance*, 4(2), 181. <https://doi.org/10.29240/jbk.v4i2.1935>
- Ambrose, S. A., Bridges, M. W., Dipietro, M., Lovett, M. C., & Norman, M. K. (2010). *7 Research-Based Principles for Smart Teaching*. http://tlc.temple.edu/sites/tlc/files/resource/pdf/What_Factors_Motivate_Students_to_Learn_.pdf
- Anderson, T., & Dron, J. (2011). International review of research in open and distributed learning. *International Review of Research in Open and Distributed Learning*, 12(3), 80–97. <https://id.erudit.org/iderudit/1067616ar>
- Apuke, O. D., & Iyendo, T. O. (2018). University students' usage of the internet resources for research and learning: forms of access and perceptions of utility. *Heliyon*, 4(12), e01052. <https://doi.org/10.1016/j.heliyon.2018.e01052>
- Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13(1), 210–230. <https://doi.org/10.1111/j.1083-6101.2007.00393.x>
- Brown, H. D., & Green, T. D. (2015). *Teaching by Principles: An Interactive Approach to Language Pedagogy*. Pearson Education.
- Catalano, A. (2015). The Effect of a Situated Learning Environment in a Distance Education Information Literacy Course. *Journal of Academic Librarianship*, 41(5), 653–659. <https://doi.org/10.1016/j.acalib.2015.06.008>
- Chen, B., & Bryer, T. (2012). Investigating instructional strategies for using social media in formal and informal learning | The International Review of Research in Open and

- Distributed Learning. *The International Review of Research in Open and Distance Learning*, 13(1), 87–104. http://www.irrodl.org/index.php/irrodl/article/view/1027/2073?utm_campaign=ellearn
- Cheston, C. C., Flickinger, T. E., & Chisolm, M. S. (2013). Social media use in medical education: A systematic review. *Academic Medicine*, 88(6), 893–901. <https://doi.org/10.1097/ACM.0b013e31828ffc23>
- Dede, C. (2009). *Comparing Frameworks for "21st Century Skills"*. 1–16.
- Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest, Supplement*, 14(1), 4–58. <https://doi.org/10.1177/1529100612453266>
- Dron, J., & Anderson, T. (2014). *The distant crowd: Transactional distance and new social media literacies*.
- Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *Internet and Higher Education*, 19(October 2013), 18–26. <https://doi.org/10.1016/j.iheduc.2013.06.002>
- Greenhow, C., & Lewin, C. (2016). Social media and education: reconceptualizing the boundaries of formal and informal learning. *Learning, Media and Technology*, 41(1), 6–30. <https://doi.org/10.1080/17439884.2015.1064954>
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hargittai, E. (2010). Digital Na(t)ives? Variation in internet skills and uses among members of the “net Generation.” *Sociological Inquiry*, 80(1), 92–113. <https://doi.org/10.1111/j.1475-682X.2009.00317.x>
- Hattie, J., & Group, T. and F. (2009). *Visible learning for teachers: Maximizing impact on learning*. [https://books.google.com/books?hl=en&lr=&id=vSoUT6PXdoIC&oi=fnd&pg=PP1&dq=self+concept&ots=XLQf1ry7LO&sig=tzpzbXV8vPXl4lYqgl7mn0GcY0%0Ahttps://cm.apspublic.ihmc.us/rid=1QBSTV8BZ-PF4KC0-2MNN/visible learning book summary.pdf](https://books.google.com/books?hl=en&lr=&id=vSoUT6PXdoIC&oi=fnd&pg=PP1&dq=self+concept&ots=XLQf1ry7LO&sig=tzpzbXV8vPXl4lYqgl7mn0GcY0%0Ahttps://cm.apspublic.ihmc.us/rid=1QBSTV8BZ-PF4KC0-2MNN/visible%20learning%20book%20summary.pdf)
- Helsper, E. J., & Eynon, R. (2010). Digital natives: Where is the evidence? *British Educational Research Journal*, 36(3), 503–520. <https://doi.org/10.1080/01411920902989227>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hrastinski, S., & Aghaee, N. M. (2012). How are campus students using social media to support their studies? An explorative interview study. *Education and Information Technologies*, 17(4), 451–464. <https://doi.org/10.1007/s10639-011-9169-5>
- Junco, R. (2012a). The relationship between frequency of Facebook use, participation in Facebook activities, and student engagement. *Computers and Education*, 58(1), 162–171. <https://doi.org/10.1016/j.compedu.2011.08.004>
- Junco, R. (2012b). Too much face and not enough books: The relationship between multiple indices of Facebook use and academic performance. *Computers in Human Behavior*, 28(1), 187–198. <https://doi.org/10.1016/j.chb.2011.08.026>
- Kirschner, P. A., & Karpinski, A. C. (2010). Facebook® and academic performance. *Computers in Human Behavior*, 26(6), 1237–1245. <https://doi.org/10.1016/j.chb.2010.03.024>
- Krolo, K. (2012). Lee Rainie, Barry Wellman, Networked: The New Social Operating System. *Revija Za Sociologiju*, 42(2). <https://doi.org/10.5613/rzs.42.2.5>
- Kuss, D. J., & Griffiths, M. D. (2017). Social networking sites and addiction: Ten lessons learned. *International Journal of Environmental Research and Public Health*, 14(3).

- <https://doi.org/10.3390/ijerph14030311>
- Kwon, M., Kim, D. J., Cho, H., & Yang, S. (2013). The smartphone addiction scale: Development and validation of a short version for adolescents. *PLoS ONE*, 8(12), 1–7. <https://doi.org/10.1371/journal.pone.0083558>
- Larry D., R., Alex F., L., L. Mark, C., & Nancy A., C. (2011). An Empirical Examination of the Educational Impact of Text Message-Induced Task Switching in the Classroom: Educational Implications and Strategies to Enhance Learning. *Revista de Psicología Educativa*, 17(2), 163–177. <https://doi.org/10.5093/ed2011v17n2a4>
- Luh, N., & Ekayani, P. (2021). The importance of student media use. *The Importance of Using Learning Media to Improve Student Learning Achievement*, 1(1), 3. https://www.researchgate.net/profile/PutuEkayani/publication/315105651_IMPORTANCE_OF_USING_LEARNING_MEDIA_TO_IMPROVE_STUDENT_LEARNING_ACHIEVEMENT_/links/58ca607eaca272a5508880a2/THE-IMPORTANCE-OF-USING-LEARNING-MEDIA-FOR-IMPROVING-ACHIEVEMENT
- Manca, S., & Ranieri, M. (2016). Facebook and the others. Potentials and obstacles of Social Media for teaching in higher education. *Computers and Education*, 95, 216–230. <https://doi.org/10.1016/j.compedu.2016.01.012>
- Md Noor, S.; Rasoolimanesh, S.M.; Jaafar, M.; Barghi, R. Inscription of a destination as a world heritage site and residents' perceptions. *Asia Pac. J. Tour. Res.* 2019, 24, 14–30.
- Noeraini, I. A., & Sugiyono, S. (2016). The influence of trust level, service quality, and price on customer satisfaction of JNE Surabaya. *Journal of Management Science and Research (JIRM)*, 5(5).
- Rashid, T., & Asghar, H. M. (2016). Technology use, self-directed learning, student engagement and academic performance: Examining the interrelations. *Computers in Human Behavior*, 63, 604–612. <https://doi.org/10.1016/j.chb.2016.05.084>
- Ravizza, S. M., Hambrick, D. Z., & Fenn, K. M. (2014). Non-academic internet use in the classroom is negatively related to classroom learning regardless of intellectual ability. *Computers and Education*, 78, 109–114. <https://doi.org/10.1016/j.compedu.2014.05.007>
- Reeve, J. (2012). *A self-determination theory perspective on student engagement*. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 149–172). Springer.
- Roblyer, M. D., McDaniel, M., Webb, M., Herman, J., & Witty, J. V. (2010). Findings on Facebook in higher education: A comparison of college faculty and student uses and perceptions of social networking sites. *Internet and Higher Education*, 13(3), 134–140. <https://doi.org/10.1016/j.iheduc.2010.03.002>
- Rouis, S., Limayem, M., & Salehi-Sangari, E. (2011). Impact of Facebook usage on students' academic achievement: Role of self-regulation and trust. *Electronic Journal of Research in Educational Psychology*, 9(3), 961–994. <https://doi.org/10.25115/ejrep.v9i25.1465>
- Sarstedt, M.; Hair, J.F.; Ringle, C.M.; Thiele, K.O.; Gudergan, S.P. Estimation issues with PLS and CBSEM: Where the bias lies! *J. Bus. Res.* 2016, 69, 3998–4010.
- Schunk, DH (2012). *Learning theory from an educational perspective*. Pearson Education, Inc
- Strayhorn, T. L. (2018). College Students' Sense of Belonging. In *College Students' Sense of Belonging* (Issue January). <https://doi.org/10.4324/9781315297293>
- Tamim, R. M., Bernard, R. M., Borokhovski, E., Abrami, P. C., & Schmid, R. F. (2011). What forty years of research says about the impact of technology on learning: A second-order meta-analysis and validation study. *Review of Educational Research*, 81(1), 4–28. <https://doi.org/10.3102/0034654310393361>
- Tess, P. A. (2013). The role of social media in higher education classes (real and virtual)-A literature review. *Computers in Human Behavior*, 29(5), 60–68. <https://doi.org/10.1016/j.chb.2012.12.032>

- Trisnani. 2018. Analysis of Access and Use of Social Media by Households and Individuals in Batu City, East Java. *Journal of Communication, Media and Informatics*, 7(2): 72-86
- Turel, O., & Serenko, A. (2012). The benefits and dangers of enjoyment with social networking websites. *European Journal of Information Systems*, 21(5), 512–528. <https://doi.org/10.1057/ejis.2012.1>
- Turkle, S. (2011). *Alone Together: Why We Expect More from Technology and Less from Each Other*. New York: Basic Books.
- Vallerand, R. J. (2012). The role of passion in sustainable psychological well-being. *Psychology of Well-Being: Theory, Research and Practice*, 2(1), 1. <https://doi.org/10.1186/2211-1522-2-1>
- Vivek, S. D., Beatty, S. E., & Morgan, R. M. (2012). Customer engagement: Exploring customer relationships beyond purchase. *Journal of marketing theory and practice*, 20(2), 122-146.
- Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21 st century competences: Implications for national curriculum policies. *Journal of Curriculum Studies*, 44(3), 299–321. <https://doi.org/10.1080/00220272.2012.668938>
- Wang, Q., Woo, H. L., Quek, C. L., Yang, Y., & Liu, M. (2012). Using the Facebook group as a learning management system: An exploratory study. *British Journal of Educational Technology*, 43(3), 428–438. <https://doi.org/10.1111/j.1467-8535.2011.01195.x>
- Wiggins, G. (2018). Seven Keys to Effective Feedback. *Feedback for Learning P*, 70(1), 10–16.
- Winne, P. H., & Nesbit, J. C. (2010). The psychology of academic achievement. *Annual Review of Psychology*, 61, 653–678. <https://doi.org/10.1146/annurev.psych.093008.100348>
- Zhu, E. (2006). Interaction and cognitive engagement: An analysis of four asynchronous online discussions. *Instructional Science*, 34(6), 451–480. <https://doi.org/10.1007/s11251-006-0004-0>
- Zimmerman, B. J. (2013). From Cognitive Modeling to Self-Regulation : A Social Cognitive Career Path 2012 THORNDIKE AWARD ADDRESS From Cognitive Modeling to Self-Regulation : A Social Cognitive Career Path. *Educational Psychologist*, 48(May), 37–41.