The Effect of Social Factors on the Use of Technology in Hybrid Learning on the Improvement of Critical Thinking Skills

Fatmawati Sabur[1](✉), Sukarman[1], and Musri Kona[2]

[1] Makassar Aviation Polytechnic, Makassar, Indonesia
fatmawatisaburatkp@gmail.com
[2] Jayapura Aviation Polytechnic, Jayapura, Indonesia

Abstract. The use of technology is critical in the hybrid learning model. A test was administered to 40 respondents aged 18 to 21 to assess the learning process's success level. The type of research used is one group pretest-posttest. Design in measuring student learning outcomes using a hybrid learning model and the use of technology in terms of social factors. Based on the results of testing learning outcomes by comparing the pre-test and post-test values, it is known that the value of the social factor variable (X1) was obtained with indicators of family and environmental conditions described in the item items. It can be stated that items X1.1 to X1.6 can be categorized as valid with the calculated R-value greater than the R-table value of 0.387. Tests to measure the magnitude of the influence of the use of technology in applying the hybrid learning model were carried out by the Nonequivalent test control Group Design with type pre-test and post-test and obtained pre-test scores in the hybrid learning class with a significant level of 0.410 obtained $>$ α (0.05) and value post-test in the classroom hybrid learning with levels significant 0.740 which obtained $>$ α (0.05). It can be concluded that the influence of social factors using technology in the application of hybrid learning models can improve students' critical thinking skills.

Keywords: Hybrid Learning · Social Factors · Technology Education

1 Introduction

The fourth industrial revolution has brought about technological advancements that are now making their way into all sectors, necessitating swift adaptation. Learning occurs through an interactive process between students, teachers, and learning resources in a classroom environment. Various components, including media and learning resources, are essential to support the learning process and achieve learning goals. The practical learning model comprises four key points: (1) quality of learning; (2) adequate level of learning; (3) rewards; and (4) time. Quality of learning pertains to the activities and actions taken by students and learners, such as the curriculum and learning experiences, as well as the media used [1].

A. A. Patak and A. H. Hasim (Eds.): W-SHARE 2022, ASSEHR 762, pp. 85–92, 2023.
https://doi.org/10.2991/978-2-38476-084-8_13

Factors that influence an educator in using information technology are social factors with a coefficient of 46.00%, task suitability of 30%, facilitating conditions of -10.10% (contribute negatively), Complexity of -48.00% (contributing negatively), Long-term consequences of 14.00%, and Affect factors (personal feelings) of 20.40%. Condition factors that facilitate a negative contribution mean that the presence of ICT devices has not received a positive response from the teacher. The complexity factor will decrease if an educator can run the application or software needed in his profession [2].

Presentation of material by applying a hybrid learning model, a learning method combining online and face-to-face learning. This model can be applied in several conditions and is generally applied in theoretical learning, while the presentation of practicum material is less effective. Online learning carried out over a relatively long period will hurt the psychosocial aspects of students. To minimize this influence, innovation is carried out, namely applying the Hybrid Learning model to maximize learning [3].

The hybrid learning model can combine classroom and online learning using existing technology [4]. The technology used in hybrid learning is in the form of personal computers. These smartphones can activate learning management system (LMS) applications, virtual zoom applications, and other applications teaching staff use to present their effective material to students [5]. Learning media that utilize technology aim to facilitate learning more effectively and efficiently [6]. Interactive and adaptable training and innovative technological means [7].

Six factors have been identified that impact the use of information technology in organizations. These factors include social, affective, complexity, task suitability, long-term consequences, and facilitating conditions. Social factors are linked to an individual's internalization of cultural reference groups and interpersonal agreements in particular social situations. These cultural groups contain norms, values, and roles influencing an individual's behavior [8].

Davis et al. found no significant statistical correlation between the utilization or use of information technology and social norms [9]. Thompson et al. discovered that social factors significantly influence computer utilization, which aligns with Triandis' theory [10]. In their study conducted in Indonesia, Rahmi Qadri and Thai Fung Jin discovered a statistically significant positive relationship between the use of information technology and social factors. This suggests that social factors significantly influence the utilization of information technology in the Indonesian context [11].

The primary purpose of the educational process is to measure the success of learning [12]. Efforts that can be made in achieving educational goals are to design a learning process that is appropriate, right on target, and has an impact on increasing student competence both from cognitive, affective, and psychomotor aspects.

The Hybrid Learning model can be applied in various ways; for example, virtual synchronous learning uses audio media, web conferencing, and video. Meanwhile, self-directed asynchronous learning and collaborative asynchronous learning rely more on learning by using a Learning Management System (LMS) learning platform that can be used by students to carry out discussion activities and complete their assignments which cannot be separated from the role of technology to grow to support the teaching and learning process under all conditions, so that the learning process can continue according

to the targeted learning outcomes in each competency. The hybrid model outperforms other methods in effectively utilizing side information and improves performance [13].

Therefore, this research was conducted to determine the effect of social factors on the use of technology in implementing hybrid learning models by utilizing personal computer technology and smartphone technology that can access learning management system applications and utilize other applications.

2 Methods

This study employs the quantitative positivism research method to establish causal relationships between variables. The study employs a one-group pretest-posttest design, in which data are collected from the same group of participants before and after an intervention. This design is useful for evaluating the efficacy of a treatment or intervention.

This study's population consists of forty respondents, representing the entire group of people the researcher is interested in studying. The sample used in the study is a complete sample, which includes all members of the population.

This study employed quasi-experiments, which compare a treatment group to a control group to determine the effectiveness of an intervention. In this instance, there is no control group, but the pretest-posttest design permits comparing results before and after the intervention.

This study's data analysis techniques include the questionnaire method, which entails collecting data from participants via a structured questionnaire. Normality and homogeneity tests are used to validate data, ensuring that the data collected is reliable and valid. Additionally, hypothesis testing determines whether the study's results are statistically significant.

The SPSS application, a statistical software suite used for data analysis, is utilized for data processing. This software enables researchers to conduct various statistical analyses, such as descriptive statistics, inferential statistics, and regression analysis. The application of SPSS guarantees that the data analysis is precise and efficient.

3 Results and Discussion

3.1 Tolerance Multicollinearity Test Analysis

The hybrid learning tolerance value for critical thinking skills is 0.225. It can be concluded that there are no symptoms of multicollinearity between the influence of the quality of hybrid learning on the ability to think critically, as shown in the following Table 1.

It appears that the tolerance value of social factor performance towards technology utilization is 0.919; it is concluded that there are no symptoms of multicollinearity between social factor variables on the use of technology. Furthermore, the value of the regression coefficient of the social factor variable is -0.045 with a negative sign, so it is stated that the social factor variable causes a decrease in the value of technology utilization by 0.045, in line with findings [14], which states that the use of information technology is found to be positively related to social activities.

Table 1. Social Factor Tolerance Multicollinearity Test on technology utilization

	Std. Coef.	t	Sig.	Collinearity Statistics	
				Tolerance	VIF
Constant	3.746	1.055	.302		
Social Factors	−.045	−.433	.668	.919	.919

Table 2. Validity Questions Think Critical

Validity	Categories	Grains Questions
r-count > r-table	Valid	2, 3, 5, 7, 8
r-count < r-table	Not Valid	1, 4, 6, 9,10

3.2 Analysis Test Try Hybrid Learning Model Instrument

3.2.1 Validity

Based on the calculation - validity question test try instruments which consists of 10 essay questions *using the* SPSS 16 Program obtained results.

Table 2 shows that the corrected item-total correlation is at grains questions 1, 4, 6, 9, and 10 < r-table = 0.444, so that grains question number the declared invalid, while the other five items, namely item number 2, 3, 5, 7, and 8 > r-table so that the item is declared valid.

3.2.2 Reliability

The study used Cronbach's Alpha value to test the reliability of the research instrument. A research instrument is considered reliable if its Cronbach's Alpha value is more significant than 0.60. The decision-making criteria for the reliability test were established as follows:

a. If the value of Cronbach's Alpha is more significant than 0.60, the items in the questionnaire are deemed reliable.
b. If the value of Cronbach's Alpha is less than 0.60, the items in the questionnaire are deemed unreliable.

The reliability test results obtained with ten questionnaires can be seen in the following Table 3.

Table 3. Test Reliability of Thinking Critical

Cronbach's Alpha	N of Items
0.641	10

Table 4. Tests Normality Think Critical Pre-Test

Class	Sig.	Conclusion Sig. > 0.05
Hybrid learning	0.410	Normal distribution

Table 5. Homogeneity Think Critical Post-test

Variables	Stages	Sig.	Sig. > 0.05
Hybrid Learnings	*Pre-test*	0.537	Data Homogeneous
	Post-test	1.214	

Based on test reliability instruments, results showed that Cronbach's alpha obtained on the grain question is 0.641, so the question is declared reliable.

3.2.3 Normality

Data is said to be generally distributed if there are no significant or standard differences compared to the standard normal. Variables are said to be generally distributed if their significance value is greater than or equal to 0.05. Conversely, if the significance is less than 0.05, the variable or data is declared not normally distributed.

Table 4 shows that the pre-test scores are in the hybrid learning class with a significant level of 0.410 obtained $>$ α (0.05), so in this study, the data come from data normally distributed so that it can be continued with test homogeneity.

3.2.4 Homogeneity

The homogeneity test in this study used the Lavender Statistical test, as shown in the following Table:

Table 5 shows the essential questions in the post-test, while the pre-test shows a significant level of 0.537. The results are $>$ 0.05, so it can be concluded that the data is in the homogeneous top.

3.2.5 Hypothesis

Test the hypothesis in this study using the *independent t-test. The* results of the hypothesis test are as follows:

Table 6. Tests Q Independent

Variables	Class	Stages	Sig. (2-tailed)
Ability Think Critical	Hybrid Learning	*Pre-test - Post-test*	0.000

Table 6 shows that the results tested a hypothesis of ability critical thinking for the independent t-test obtained sig (2-tailed) < 0.05, which is 0.00; this indicates that H_0 was rejected and H_1 received.

Hybrid learning is a form of education combining face-to-face and online learning using technology to facilitate learning. Social factors such as teacher-student interaction, peer-to-peer interaction, and collaborative learning can significantly impact the use of technology in hybrid learning and improve critical thinking skills.

In hybrid learning, teacher-student interaction is crucial for effective technology use and for improving critical thinking skills. Teachers can guide and support students in using technology, provide feedback, and encourage them to think critically about the information they encounter online. The quality of teacher-student interaction can influence engagement, motivation, and participation in the learning process, affecting the development of critical thinking skills.

Collaboration and peer-to-peer interaction in hybrid learning can also foster the development of critical thinking skills. Social interaction can facilitate sharing of ideas, perspectives, and feedback among students, enhancing their understanding and analysis of complex issues. Through collaboration, students can learn from each other, challenge their assumptions, and develop a deeper understanding of the subject matter. Collaborative learning activities such as group discussions, debates, and projects can promote critical thinking skills by encouraging students to analyze, evaluate, and synthesize information from multiple sources. Collaborative learning can also help students develop communication and teamwork skills essential for success in today's workplace.

Social factors such as teacher-student interaction, peer-to-peer interaction, and collaborative learning can significantly impact the use of technology in hybrid learning and improve critical thinking skills. By creating an engaging and supportive learning environment that promotes social interaction, hybrid learning can enhance students' critical thinking skills and prepare them for success in their academic and professional lives.

4 Conclusion

From the results of the above study, it can be concluded that social factors do not significantly influence the use of technology. In contrast, in applying the hybrid learning model, technology is the main factor in the success of the teaching and learning process to improve students' thinking skills.

Acknowledgements. The research was supported by Makassar State University, which has facilitated the Makassar Aviation Polytechnic and Jayapura Aviation Polytechnic in supporting the Tri-dharma activities of higher education.

References

1. S. Punaji, "Creating Effective and Quality Learning," *J. Inov. and Technol. Learning*, vol. 1, no. 1, pp. 20–30, 2014.
2. S. Wimartono, B. Soedijono, and A. Amborowati, "Analysis of the Influence of the Use of Information Technology on the Teacher Profession (Case Study: Kebumen Regency)," *Creat. inf. Technol. J.*, vol. 3, no. 1, p. 74, 2016.
3. M. Makhin, "Hybrid Learning: Learning Models during the Pandemic Period at SD Negeri Bungurasih Waru Sidoarjo," *Mudir J. Manaj. Educator.*, vol. 3, no. 2, pp. 95–103, 2021.
4. T. Ramdhani, IGP Suharta, and IGP Sudiarta, "The Influence of Schoology-Assisted Hybrid Learning Learning Models to Improve Mathematics Learning Achievement for Class Xi Students of SMAN 2 Singaraja," *J. Educator. Matt. Undiksha* , vol. 11, no. 2, pp. 2613–9677, 2020.
5. PD Purnasari and YD Sadewo, "Utilization of Technology in Learning as an Effort to Improve Pedagogic Competence," *Publ. Educator.* , vol. 10, no. 3, p. 189, 2020.
6. F. Firmadani, "Technology-Based Learning Media as Learning Innovation in the Industrial Revolution Era 4.0," *Pros. Conf. Educator. Nas.* , vol. 2, no. 1, pp. 93–97, 2020.
7. D. Tayouri, "The Human Factor in the Social Media Security – Combining Education and Technology to Reduce Social Engineering Risks and Damages," *Procedia Manuf.* , vol. 3, no. Ahfe, pp. 1096–1100, 2015.
8. D. Rahmawati, "Analysis of Factors Influencing the Utilization of Information Technology," *J. Ekon. and Educators.*, vol. 5, no. 1, pp. 107–118, 2012.
9. FD Davis, RP Bagozzi, and PR Warshaw, "User acceptance of information technology: a comparison of two theoretical models," *Manage. sci.* , vol. 35, no. 8, pp. 982–1003, 1989.
10. RL Thompson, CA Higgins, and JM Howell, "Influence of Experience on Personal Computer Utilization: Testing a Conceptual Model," *J. Manag. inf. syst.* , vol. 11, no. 1, pp. 167–187, Jun. 1994.
11. FT Jin, "Analysis of Factors Influencing the Utilization of Information Technology and the Influence of Utilization of Information Technology on the Performance of Public Accountants," *J. Business and Accountants.* , vol. 5, no. 1, pp. 1–26, 2003.
12. Syamsuar and Reflianto, "Education and Challenges to Information Technology-Based Learning in the Era of the Industrial Revolution 4.0," *J. Ilm. Technol. Educator.* , vol. 6, no. 2, pp. 1–13, 2018.
13. X. Dong, L. Yu, Z. Wu, Y. Sun, L. Yuan, and F. Zhang, "A hybrid collaborative filtering model with deep structure for recommender systems," in *31st AAAI Conference on Artificial Intelligence, AAAI 2017* , 2017.
14. N. Asiamah, A. Kanekar, HTA Khan, S. Panday, and SW Mensah, "Neighborhood walkability as a moderator of the associations between older adults' information technology use and social activity: A cross-sectional study with sensitivity analyzes ," *J. Transp. Heal.* , vol. 26, no. July, p. 101480, 2022.