PRE-SERVICE STUDENT TEACHERS' PERCEPTION OF USING GOOGLE CLASSROOM IN A BLENDED COURSE

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Abstract

Purpose of the study: The strategic and learning media course in the Informatics Engineering Education department for pre-service student teachers apply a blended learning method. The purpose of this method is to integrate between face-to-face meetings in the classroom and distance learning by using internet-based Learning Management System (LMS) media. This study aims to determine the perceptions of the informatics' pre-service student teacher, which utilize the Google Classroom LMS.

Methodology: The research method used online questionnaires and divergent questionnaires were analyzed with the Technology Acceptance Model (TAM) approach and descriptive statistics. The factor analysis included the ease of access, perception of usefulness, communication and interaction, a perception of lecture delivery, student comfortability, and the effectiveness of the Google Classroom LMS.

Main Findings: The results showed that most students felt the ease and improvement of the quality of the blended lectures using Google Classroom, although several notes needed further improvement and evaluation.

Practical Implications: The findings suggest that the stakeholders of teacher training and education faculty could measure the level of perceivers and readiness of their pre-service student teachers on using Google Classroom in a blended-setting course. Further, the pre-service student teachers have experience in using this LMS so that they could apply this learning model for their students.

Novelty/Originality of this study: This article found that students feel the satisfaction of using Google Classroom as an active and independent learning tool. This study also demonstrated consistency based on observations, surveys, and analysis of college students' perceptions that the design of blended learning by using Google Classroom is still beneficial to the success of reaching the course outcomes.

Keywords: Google Classroom, TAM, LMS, Pre-service Student Teacher, Blended Learning

INTRODUCTION

The arrival of the 21st century has changed a lot of systems (disruption) in a variety of areas. However, the higher education system in Indonesia face challenges to improve its educational system to adopt the industrial revolution (Industry 4.0). Therefore, higher education institutions can produce experts and academics for the future who can adapt to the changing patterns of the work (Ahmad, 2018).

Higher education programs must be integrated and relevant to industry 4.0. One key for reaching the goal is to apply the learning process (e-learning) and mix it with traditional lecture, namely, blended learning (Nasir, 2018). Blended learning is a learning approach based on the characteristics and the completeness of Learning Management System (LMS) into the corresponding software to support e-learning with a mixed approach of lectures (Hidayat, 2018).

The use of LMS, according to Sorbie (2015), can facilitate access to content, assess learners' knowledge, provide feedback, and promote collaboration and communication in teaching or lecturing. Further, Kearney et al. (2012) stated that the LMS could be a useful tool to implement pedagogy or teaching and learning interactions.

According to these findings, the Faculty of Teacher Training and Education (FKIP) Universitas Muhammadiyah Surakarta intensify the use of LMS in lectures in several departments. The implementation of LMS separates into several forms, such as Schoology, Google Classroom (GC), and Moodle. Therefore, the objectives of the present study were to determine the perceptions of the informatics' pre-service student teachers program, which utilize the Google Classroom LMS.

LITERATURE REVIEW

Pre-Service Student Teacher in the Digital Era

School teachers or pre-service student teacher institutions relate with a new generation of students who are growing up with technologies as ubiquitous equipment, for instance, ICT tools (Tondeur, Siddiq, Scherer & Baran, 2017). Online learning (using the internet and mobile-based technologies in learning practices) has become an essential capability at higher pre-service teacher institutions because it supports the students to learn beyond classrooms and gives flexibility in learning (Newhouse, Williams & Pearson, 2006). Blended learning could be a connector that acts as a bridge between the old and the new instructional methods by impacting policy and strategic plan initiatives in the education milieu at virtually every level (Moskal, Dziuban & Hartman, 2013).

Google Classroom in a Blended Learning Course

Google Classroom (GC) is required in teaching and learning when it involves the learning activities related to computers and mobile devices (Juniati et al., 2017; Kumar & Bervell, 2019). GC has functionalities to help teacher and student jobs, such as the report on the results of observation; ask questions/quizzes online; reviewing the literature and other sources of information to measure the understanding of learners; planning investigations; analyze and interpret data; propose answers, explaining a phenomenon through a short essay; make predictions; and communicate the results (Nizal, et al., 2016).

GC is a free application platform from Google to support teaching and learning program. GC has supported other Google applications, such as document processing (Google docs, Google sheet, and Google presentation), Google Drive, YouTube, Google Calendar, and Google mail (Gmail). YouTube has a video sharing site that has already pasted the link in the GC, Google form is a tool to create questionnaires and exams for synchronous, Google Calendar supports agenda and planning activities, and Gmail acts as the main entrance for all Google tools (Stiglitz, 2016).

Some features in GC can be divided into four main parts (Bell, 2015): (1) Home: The feature is commonly found on LMS, especially as the entrance to system management. The feature consists of registration and login system. The teachers can create and manage virtual classes, add new students, add details of class information, and add class teaching materials, (2) Stream: The feature consists of comment settings, lecture topic lists, list of lecture activities in the classroom, and viewing student activities, (3) Student portal: The feature consists of detailed assignments for students, list assignments, job cancellations, task management, assignment assessment, and reviewing student task portfolios, (4) Announcements and questions: The feature serves to send assignments, questions, and announcements to students.

According to Garrison and Kanuka (Geer, 2009), a blended learning approach is a combination of face-to-face learning and online experiences, integrating synchronous (classroom) and asynchronous (text-based) activities. However, there is a complexity in the integration of deliberate, effective, and innovative design implementations that can support deep and meaningful learning. Information and Communication Technologies (ICT) have provided tools, which offer limitless design possibilities and applications. Therefore, the success of lecture with a blended approach will be in the merging of such design components.

Blended learning has some benefits, such as providing chances for broader interaction and access to knowledge to learners, able to develop the efficiency and effectiveness of the learning process, and can conduct the collaborative learning process with other educational institutions (Dewi, Ciptayani, Surjono & Priyanto, 2018). However, according to Dewi (2018), blended learning in Indonesia will not substitute the conventional learning system, but is a complement to the traditional method.

Strategies and Learning Media Course

Over the last decades, the Lecture Strategy and Learning Media Informatics Technology (SLMIT) still emphasize teacher-centered learning approach; professors used visual aids, such as blackboards, software presentation slides, and images/charts. However, after the revitalization of the curriculum, the classroom has been transformed into lectures that emphasize active learning and lectures with a mix of approaches (blended learning) by using the LMS.

SLMIT lecture consists of four activities: lectures and discussions, field observation, simulation, and evaluation (exercise/assignment/exam). Lectures and discussions are used to transfer content fundamental theories of learning, learning models, learning approaches, teaching methods, as well as learning techniques and tactics. Field observations are carried out in groups of the Muhammadiyah Secondary School (junior high school and vocational school) in Solo

Raya to know the availability of ICT and to observe the readiness in implementing 2013 curriculum by applying ICT or ICT-based features.

The simulation is a part of lectures, which is accounted for 40% of the lectures. In this session, the students are formed into a group and microteaching is simulated in the classroom. The student group has a task of uploading an instructional video on YouTube by applying the theory, strategy, approach, and application of ICT-based learning media that has been previously studied and discussed. After that, the lecturer provides reviews or clarification of the students' task. Besides, the students have a role in evaluating the group that has performed.

Technology Acceptance Model (TAM) was developed by Davis (1986) to explain the acceptance of using technology. Davis utilized components of beliefs and attitudes in this model approach and the exclusion of normative beliefs and subjective norms (Ramdhani, 2009). TAM has based itself on the Theory of Reasoned Action (TRA), which was developed by Ajzen and Fisbein (Lee, Kozar & Larsen, 2003). TRA explains the reactions and perceptions of users of Information Technology (IT), which affect its position in the acceptance of technologies. The main objective of TAM is to explain the determination of the acceptance of computers in general and provide an explanation of the behavior or attitudes of the users in a population (Davis, 1986).

According to Sayekti and Putarta (2016), TAM debriefed that two beliefs determine behavioral intention to use: perceived usefulness and perceived ease of use. Perceived usefulness is defined as the level of personal belief generated from performance improvement after using the system. Perceived ease of use is the explanation of personal belief about the easiness to use the system. TAM describes that the impact of such external variables (characteristics of the system, process development, and training) to the intention to use is mediated by perceived usefulness (PU) and perceived ease of use (PEoU). TAM theory is schematically illustrated in Figure 1.
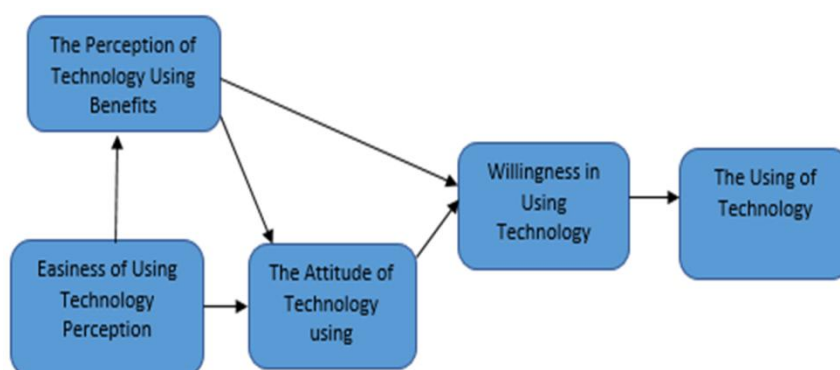

Figure 1. Technology Acceptance Model (TAM) (Davis Ramdhani, 2009)

Davis (Ramdhani, 2009) stated that the perception of the benefits of using ICTs also affects the perceived ease of using ICT and not vice-versa. Thus, as long as people feel that ICTs are helpful in his duties, he would intend to use ICTs regardless of whether it is easy or not easy to use.

METHODOLOGY

The population of this research is the 4th-semester of Informatics pre-service student teachers who were taking courses in the Learning Strategies and Media Informatics (SLMIT). Simple random sampling was used by selecting students who had registered in the Google Forms application and spread the link randomly in the WhatsApp group of 4th-semester. The survey included questions about demographics, five kinds of predictor variables, and student satisfaction in the use of GC. Demographic questions, such as gender, were not asked directly but on behalf of students who completed the survey.

The development of the instrument and the questionnaire was based on the internet self-efficacy scale, developed by Larose and Eastin (LaRose and Eastin, 2004; Nizal et al., 2016). The questionnaire was divided into a four-point Likert scale that included Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The values for a positive statement score were SA: 4, A: 3, D: 2, and SD: 1, and the values for a negative statement score were SA: 1, A: 2, D: 3, and SD: 4.

The questionnaire was distributed to respondents after the grades for the final exams were issued, so as to avoid compulsion or obligation for the related value of unpublished lectures. The instrument's verification and calibration for this research was done by using the Rasch model (Sumintono, 2014), because it validates three important sectors of

validity: measurement scale, person, and items. The data were analyzed by using descriptive and inferential statistics and by using Winstep software. Based on the survey, it is known that most of the respondents were male. The respondents comprised of 36 fourth-semester students who had taken SLMIT courses. The percentage of male and female student respondents was 58.3% and 41.7%, respectively.

DISCUSSION

The summary statistics using Winstep resulted in the attainment of information about the respondents' quality, instruments used, and the interaction between items and respondents. It was found that the measure number of a person is 0.89. The mean value, which is more than 0.0, shows that the respondents tend to answer "agree" in almost all items. The Alpha Cronbach value is 0.83, which means that the reliability (interaction between items and person) is good. Meanwhile, each of the person's reliability and items' reliability shows 0.79 and 0.86, respectively, which means that the person's reliability is fair enough and the items' reliability is good. It can be inferred that the consistency of the respondents is weak, but the quality of the items is good enough.

Based on the TAM model and the internet self-efficacy scale (developed by Eastin and Larose), five kinds of predictor variables are used for analysis in this study (Nizal et al., 2016). The five predictors are: ease of access, sense of usefulness (perceived usefulness), communication and interaction, presentation of instructional materials (perceived instruction delivery), and student satisfaction.

Table 1: The average value of each component of the ease of access

Factor	Component	Mean
Ease of access	Log in or sign in to GC	3.71
	Access material	2.95
	Receive assignments online	3.41
	Collect assignments online	3.59
	Lecture system with GC	2.78

Table 1 depicts that the average value of the ease of access is for easy login into the system because GC is integrated with Gmail (3.71). When students log in, the display is easily accessible. Also, when students install GC applications on their devices, they are more convenient to log in quickly with Android or iOS smartphone. The average of the lowest value is the mix lectures (blended) by GC (2.78). It occurs because blended learning is still relatively new in the Informatics Engineering Education program. Previous students have been able to access the Schoology for online learning, which is a different application. Based on these data, lecturers need to clarify further the system of lectures, consistent with the rules, and provide a more detailed explanation about the use of GC in lectures on related subjects.

Table 2: The average value of each component of the usefulness taste (perceived usefulness)

Factor	Component	Mean
A sense of usefulness	Quality memorable lecture	3.22
	The quality of the faculty-student interaction among students in the lecture	3.09
	GC helps punctuality and discipline to the task	3.37
	Benefits of response or confirmation of lecturers	3.02
	The scoring system reflects the relevant GC-effective results with real assessment	2.98
	The consistency of the assessment, purpose, and direction of lectures in GC	3.12

Based on Table 2, it can be observed that the highest value for the usefulness of GC is that it helps students to do their task on time (3.37). The GC system provides clear deadlines of the assignment and the time of collection. Iftakhar (2016) reported that GC could accustom students to work with discipline. Meanwhile, the average of the lowest value of the GC system components is less consistent (2.98). It is because the lecturers are unlikely to give a prompt feedback to students and due to the lack of an assessment rubric. As a result, students feel less GC assessment by providing comfort for them. Besides, several students do not provide feedback (complaint or question) immediately when the value of their task is issued. Students prefer to wait for a remedial program rather than to communicate via discussion menu in GC.

Table 3: The average value of each component of the communication and interaction

Factor	Component	Mean
	The convenience of using GC in blended learning activities	3.07
	The lecturer invites college students active in the blended lecture	3.14
Communication and interaction	Comfort class student interaction with friends through GC	2.73
	The enthusiasm of the lecturer in explaining either face to face or online	3.12
	Discussion and feedback adds to the scientific classmates	3.17
	Lecturer familiar, accessible, and attention	3.07

The data in Table 3 can be used to analyze the average of the highest value for the interaction by using GC. In the class, GC can enhance the atmosphere of collaboration, which impacts the rise in the scientific capacity (3.17). Meanwhile, the average of the lowest value is the comfortability of interaction among students in the class using GC (2.73). Students want a real interaction face-to-face rather than through the GC. It can occur because the facility to chat or discuss in the GC is not complete and useful like social media. Students use their gadgets for being active social media users with all its features and therefore, they feel uncomfortable while interacting via GC.

Table 4: The average value of each component of the instructional presentation or material (perceived instruction delivery)

Factor	Component	Mean
Instructional	Directing lecturer to the purposes and blended tuition plan	2,84
presentation	Communication from lecturers about setting deadlines and time assignment	2.88
/ material	Explanation lecturers related competencies to be achieved in the course	2.83
(perceived	Conditioning of atmosphere to the purpose of lectures	2.95
instruction	Advice, direction, confirmation lecturer on the course so that students understand the material	2.95
delivery)	Clarity of instructions related to the course lecturer blended course activity	2.90

Based on the data in Table 4, it can be inferred that the average of the highest value is the conditioning of atmosphere in accordance with the lectures and advice destination, direction, and confirmation of lecturers on the course (2.95). However, the value is still below the compared average of 3.00, which means that there is a lack of acceptance about the atmosphere by students in blended lectures. Students want the presence of a lecturer at the college and obtain direction, confirmation, and advice directly (offline). The lowest value relates to lecturer competencies (2.83). Students feel discomfort when the lecturer is absent and get their time "replaced" by an assignment via GC.

Table 5: The average value of each component of student satisfaction

Factor	Component	Mean
	The use of media in accordance with the purpose of taking subjects	3.07
Student satisfaction	Recommendations related to the use of GC students in the lecture	3.09
	GC as a good alternative for lectures blended	3.00
	GC can improve morale, motivation, and self-study	3.17

Based on Table 5, it can be observed that GC is recognized and can develop students' motivation, spirit, and self-study. The average of the highest value of this component is 3.17. The students perceive that GC features and the deadline enable most of them to bear responsibility and finish the assigned job on time. The average of the lowest value is the recommendation of the GC as an alternative student LMS, which is appropriate for blended lectures, but the value is high (greater than or equal to 3.00). These averages indicate that GC is still the students' choice for lectures on SLMIT subjects.

CONCLUSION

The Informatics pre-service student teachers feel satisfied to use Google Classroom as an active and independent learning tool. This study also demonstrates consistency based on observations, surveys, and analysis of college student perceptions for using a blended learning model. Google Classroom is beneficial to the success of the course outcomes. In addition, Google Classroom is relevant when it is integrated into the SMPTI lectures. The Learning Management System is no less important as it enables students to gain competencies and skills for preparing and adapting to the learning revolution 4.0, which is characterized by blended and distance learning.

REFERENCES

Ahmad, I. (2018). Digital learning process in the age of the industrial revolution 4. 0 era technology disruptions. Ministry of Research, Technology and Higher Education, 1-13.

Bell, B. K. (2015). Teacher ' s guide to google's classroom. *Shake Up Learning, LLC*, 1–45

Davis, FD (1986). A technology acceptance empirically testing new models for end-user information systems: Theory and results. Management, PhD. (April), 291. https://doi.org/oclc/56932490

Dewi, K. C., Ciptayani, P. I., Surjono, H. D., & Priyanto. (2018). Critical success factor for implementing vocational blended learning. *Journal of Physics: Conference Series*, *953*(1). https://doi.org/10.1088/1742-6596/953/1/012086

Geer, R. (2009). Strategies for blended approaches in teacher education. *Effective Blended Learning Practices*, 39–61. https://doi.org/10.4018/978-1-60566-296-1.ch003

Hidayat, ML (2018). The modification of lms quipperschool to improve senior high school students' concept mastery of biology subject, topic: human reproduction health. *Journal of Educational Science and Technology* (EST), 4 (1), 32-38., 4 (1), 32-38.

Iftakhar, S. (2016). Google classroom: what works and how? *Journal of Education and Social Sciences*, 3 (1), 12-18. Retrieved from http://jesoc.com/wp-content/uploads/2016/03/KC3_35.pdf

Juniati, D.,*et.al*. (2017). Implementing google apps for education as learning management system in math education. *IOP Conf. Series: Journal of Physics: Conf. Series* 895 (2017) 012053, 895. https://doi.org/10.1088/1742-6596/895/1/012053

Kearney, M., Schuck, S., Burden, K., & Aubusson, P. (2012). Viewing mobile learning from a pedagogical perspective. *Journal Research in Learning Technology*, 20 (1), 1-18. https://doi.org/10.3402/rlt.v20i0/14406

Kumar, J. A., & Bervell, B. (2019). Google classroom for mobile learning in higher education : Modelling the initial perceptions of students. *Education and Information Technologies*, 1793–1817. https://doi.org/https://doi.org/10.1007/s10639-018-09858-z

LaRose, R., & Eastin, MS (2004). A social cognitive theory of internet uses and gratification: toward a new model of media attendance a social cognitive theory of internet uses and gratification: toward a new model of media attendance. *Journal of Broadcasting & Electronic Media*, 48 (3), 358-377. https://doi.org/10.1207/s15506878jobem4803

Lee, Y., Kozar, KA, & Larsen, KRT (2003). The technology acceptance model: past, present, and future. Communications of the Association for Information Systems, 12 (50), 752-780. https://doi.org/10.1037/0011816

Moskal, P., Dziuban, C., & Hartman, J. (2013). Blended learning: a dangerous idea? *Internet and Higher Education*, *18*, 15–23. https://doi.org/10.1016/j.iheduc.2012.12.001

Nasir, M. (2018). Improving the quality of vocational education in the era of industrial revolution 4.0. Kemenristek Higher Education.

Newhouse, C. P., Williams, P. J., & Pearson, J. (2006). Supporting mobile education for pre-service teachers, *22*(3), 289–311.

Nizal, I., Shaharanee, M. Jamil, JM, Syamimi, S., & Rodzi, M. (2016). The application of google classroom as a tool for teaching and learning. Journal of Telecommunication, Electronic and Computer Engineering, 8 (10), 8-11.

Ramdhani, N. (2009). Model behavior using ict "NR2007" development of the technology acceptance model (tam). Psychology Bulletin, 17 (1), 17-27. https://doi.org/10.22146/bpsi.11478

Sayekti, F., & Putarta, P. (2016). Application of the technology acceptance model (tam) in acceptance testing model of regional financial information system. *Journal of Theory and Applied Management*, 9 (3), 196-209.

Sorbie, J. (2015). Exploring teacher perceptions of blended learning. *ProQuest Dissertations and Theses*, 251.

Stiglitz, J. (2016). Google apps in classrooms and schools.

Sumintono, B. & W. Widhiarso. (2014). *Rasch model application for social science research*. Yogyakarta: Trim komunikata ISBN: 978-602-14371-1-7

Tondeur, J., Siddiq, F., Scherer, R., & Baran, E. (2017). Exploring the link between pre-service teachers' ICT-related profiles and their TPACK