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The Impact of External Factors on the Acceptance of Educational Technology Among the Indonesian Junior School Teachers

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Abstract: Literature shows the immense importance of technology acceptance among junior school teachers. Hence based on the Technology Acceptance Model (TAM), the current study aims to investigate the impact of various external factors, i.e., appreciation learning climate, facilitation learning climate, learning through reflection, and learning through experimentation on the adoption of technology among junior school teachers in Indonesia. Using a quantitative field survey, data were collected from 410 respondents and were analyzed using SmartPls3 by testing through the measurement and structural model. Results revealed that junior school teachers have a positive attitude towards the use of educational technology. Also, the external factors, i.e., appreciation learning climate was positively associated with perceived usefulness. Whereas facilitation learning climate, learning through reflection, and learning through experimentation were found to be positively and significantly associated with the perceived ease of use and actual use of the educational technology. Integrating Motivation-Hygiene Theory with the TAM model, this study revealed how multiple external factors motivate teachers to incorporate educational technology in their teaching methodologies. Besides extending the literature related to TAM and motivation theory, several future research directions are suggested.

Keywords: School Innovation Climate, School Culture, Attitude towards Educational Technology, Junior School Teachers, TAM

1. Introduction

The incredible technological advancements prevailing in every field requires constant improvement in the quality of processes, methods, and learning techniques (Reddy, Sharma and Chaudhary, 2020). The digital age comprising contemporary and new technologies has allowed the interconnection of the web, resources, and people worldwide, providing them with the ease and benefit of getting things done in the best possible way (Lu et al., 2021). This technological era has brought life-changing developments that offer educational institutions the luxury of new and advanced learning and teaching techniques that instigate and contribute to the progression of an individual's potential and lifelong learning (Sakarji et al., 2019). Moreover, the development and implication of new ways of knowledge, conglomeration, and technology-based learning have paved the way for ingenious mechanisms of innovative instructions and learning (Sharma et al., 2019). The expanded adoption of technology in educational institutions has proliferated in this high-tech era of the digital age (Reddy, Sharma and Chaudhary, 2020; Yamamori, 2019), which makes it imperative to amalgamate these technologies for learning in conjunction with user's acceptance of technology, competencies, and self- efficacies (Cacciamani et al., 2018).

Furthermore, keeping in view the Kozma (1994) debate in the 21st century, which focuses on whether media technologies are responsible for learning, the literature reveals that technology plays a key role in motivational learning and synergetic observations, which are triggered by the unification of technological tools (Pinto-Llorente et al., 2017, Sawatsuk et al., 2018, Al Rawashdeh et al., 2021). Besides, literature has acknowledged the importance of implementing technological advancements among students to amplify their learning effectiveness and capabilities (Pinto-Llorente et al., 2017). Additionally, although educational institutions have started embracing and acknowledging the significance of technology used for the enrichment and effectiveness of teaching and learning aftermath (Rasmussen and Hagen, 2015) and it has also been realized that propitious involvement of teachers is the focal point in acknowledging the technological educational environment (Bervell, Nyagorme and Arkorful, 2020). However, teachers perceive and encounter various challenges while adopting new technologies (Mercader and Gairín, 2020), which need to be addressed to facilitate the adoption of modern technologies in the teaching and learning process.

Moreover, in defiance of the prodigious potential that technology possesses for bolstering and cultivating student learning (Gokcearslan, 2017), the enlightenment of teachers with the technology and its eloquent incorporation into teaching is the biggest challenge (Lawless and Pellegrino, 2007). In connection to that, in a recent study, Mulenga and Marbán (2020) demonstrated the dire need to deeply explore external factors that influence the learning environment and incorporate technology into that particular environment from the instructors' point of view. Likewise, Bhattarai and Maharjan (2020) have also suggested and specifically emphasized identifying and analyzing the external factors that affect the teachers' motivations and technological acceptance and its integration in the educational context, specifically among junior school teachers. Therefore, based on the extensive literature review, this study examines the impact of various external factors, i.e., appreciation learning climate, facilitation learning climate, learning through reflection, and learning through experimentation on acceptance of technology among junior school teachers.

Appreciation learning climate refers to an organizational climate, where continuous learning as part of valued behavior is rewarded (Mazer, Murphy and Simonds, 2007). Besides, a facilitation learning climate provides a favorable psychological, physical, and social environment where teaching and learning take place effectively and efficiently (Luczak and Kalbag, 2018). Hence, both appreciation and facilitation learning environments encourage teachers to continuously adopt new technologies to facilitate learning by praising and rewarding their efforts and providing the required facilities. Besides, learning through reflection refers to learning from the experiences of oneself and others to shape the future course of actions (Huang, Klein and Beck , 2020). Moreover, learning through experimentation is a more powerful and effective way of learning in groups, particularly when linked with technology adoption (Marrades et al., 2021). Hence, it is proposed that learning through reflection and experimentation acts as an external factor that encourages teachers to adopt and use educational technologies.

Furthermore, the theoretical foundation of the current study is established on Motivation Hygiene Theory (Herzberg, 1959) and the TAM model. The Motivation Hygiene Theory postulates that various external factors play an important role as motivators to facilitate the perceived usefulness, ease of use, and actual usage under the TAM model. This model's core function is to elaborate on users' attitudes and expectations (Bhattarai and Maharjan, 2020). It posits that perceived usefulness and perceived ease of use determine users' attitudes toward technology and behavioral intentions, which further influences the actual use (Elkaseh, Wong and Fung, 2016). From a contextual perspective, the TAM is mostly applied in developed countries (Reddy, Sharma and Chaudhary, 2020). However, its extension towards developing countries is also recommended in various studies (Mulenga and Marbán, 2020, Bervell, Nyagorme and Arkorful, 2020). Unique data settings of Indonesian junior level school teachers in developing countries is another major advance of this research.

Additionally, research on factors like facilitation regarding the teacher's side has been silent, requiring attention to meet challenges and opportunities related to technology acceptance among school teachers (Islahi, 2019). Integrating these external factors as motivat according to motivation-hygiene theory (Herzberg, 1959) from the TAM perspective is a significant advance to the body of knowledge related to TAM and education research. Therefore, this study aims to bridge these gaps and answer the following questions.

1. How can the TAM model be extended using external factors such as appreciation learning climate, facilitation learning climate, learning through experimentation, and learning through reflection?
2. How do these factors help teachers' motivation to integrate themselves with technology?
3. How can these external factors, TAM and Indonesian school settings be integrated to enhance teachers' motivation to perceive and use the technology for better learning outcomes?
4. How Motivation Hygiene Theory plays an important role with TAM to motivate and facilitate junior school teachers for e-learning with external motivators investigated in this study?

2. Theoretical background and hypotheses development

This study is going to extend the technology acceptance model in integration with motivation-hygiene theory by examining the external factors which play their motivational role in either determining teachers' perceived usefulness or their perceived ease of use, which further influence the teachers' attitudes, intentions, and ultimately actual use of technology in the classroom settings. These external variables pitched in this study as motivators are appreciation learning climate, facilitation learning climate, learning through reflection, and learning through experimentation, discussed below.

2.1 Appreciation Learning Climate

Although educational institutions have started embracing and acknowledging the significance of technology, however, adoption of modern technologies has remained a bigger challenge in educational institutions for years (Bumblauskas and Vyas, 2021). Moreover, Fauzi et al. (2021) asserted that regardless of students' ease of using advanced learning tools, technology implementation is not necessarily accepted by users. Another study conducted by Karasneh et al. (2021) among university professors and lecturers in public universities across Jordan identified various factors, including poor internet connection, uploading capacity, and family atmosphere, as the main barriers to online learning adoption technologies. On the other hand, Najjemba and Cronjé (2020) asserted that various factors, including the school environment, can play an important role in adopting new technologies. School climate can also refer to the school environment that is the extent to which everyone performs, including teachers and students (Johnson and Stevens, 2006, Nedal and Alcoriza, 2018). It is about the perceptions held by the students, staff, teachers, and other school members regarding social interactions (Rudasill et al., 2018), which may also impact on behaviors of the students and the motivation of the teachers. Definitions of climate generally emphasize the importance of providing appreciation (material and non-material rewards) for valued behavior (Schneider et al., 2013). The employees who critically develop themselves are rewarded by their organizations (Nikolova et al., 2014b, Luczak and Kalbag, 2018). Therefore, it is implicit that the presence of an appreciation learning climate in schools results in enhanced motivation among teachers, which in turn develops a positive perception of technology use among the teachers to make themselves more equipped with the latest technologies (Woo et al., 2020). Thus, based on the literature and the above arguments, it is hypothesized that;

H1a: *Appreciation learning climate is positively associated with the perceived usefulness of educational technology among junior school teachers.*

Technology is a platform that can be easily acquired for granted when it is engaged in daily life, but it is not widely used because of the lack of monetary benefits for achieving access (Al Rawashdeh et al., 2021). Some scholars believe that the global knowledge available on the internet is led by increasing the proportion of computers and other technological devices to students (Olaniran, Duma and Nzima, 2017; Söbke and Reichelt, 2018). Besides, the adoption of modern educational technologies is considered the stepping stone in enhanced learning (Ahmed, Hussain and Farid, 2018). Scholars identified various institution (lack of training, funding, and resources) and personal (teachers' attitudes, perceptions, and motivations) level barriers in the adoption of educational technologies (Lawrence and Tar, 2018, Mercader and Gairín, 2020). In contrast, Siyam (2019) demonstrated that some social factors like convenience positively influence the actual use of the technologies. Concerning the teachers' perception of appreciation learning climate and its association with the actual usage of the technology, various studies demonstrated that teachers' use of information technology is influenced by several factors (Hina, Dominic and Zaidi, 2020; Faubert, 2019; Aparicio, Bacao and Oliveira, 2016). Ertmer and Ottenbreit-Leftwich (2010) stated that teachers' perception of context could influence the teacher's decision to use the technology. Thus, based on the fact that the teachers' behavior regarding the use of educational technology can be influenced by multiple factors like the appraisals, rewards and positive words from the supervisors and peers, etc. it is assumed that the appreciation learning climate provided to them results into the enhancement of their motivation level further to utilize the modern technologies in their teaching practices; therefore, it is hypothesized that;

H1b: *Appreciation learning climate is positively associated with the actual use of educational technology among junior school teachers.*

2.2 Facilitation Learning Climate

When describing or operationalizing the conditions that specify organizational climate, scholars often refer to "support of," "facilitation of," and "opportunities for" certain practices (Kyndt et al., 2009). In the era of technology, teachers should also recognize the benefit of technology to get a competitive edge. In a study, Hansen, Saridakis and Benson (2018) identified that perceived risk and trust could affect the perceived ease of using the technology. Whereas, in the current study, we posit that when the facilitation learning climate provides necessary resources to incorporate the technology in classrooms such as appliances and training, the teachers' motivation and perception of easy to use the technology becomes stronger. Therefore, it is hypothesized that;

H2a: *Facilitation learning climate is positively associated with the perceived ease of use of educational technology among junior school teachers*

According to Marsick and Watkins (2003), organizational support for professional development is essential for actual learning. Several scholars have identified different climate-related external factors that influence the use of technology in different organizational settings. For instance, in a study, Palumbo and Manna (2019) found that the school climate positively affects academic achievement. In another study, Aldridge, Mcchesney and Afari (2018) analyzed the effect of school climate on students' ability to adapt the modern technological methods to facilitate their learning. They explained that school climate plays an integral part in enhancing students' knowledge and interactive abilities as it helps them cooperate with their teachers and be involved in healthy discussions. The facilitation learning climate of any organization may produce positive outcomes such as a creative work approach, technology acceptance, performance, etc. (Jaiswal and Dhar, 2015). In line with the previous studies, we hypothesize that these positive outcomes towards individual teachers will enhance motivation to use technology. Hence following hypothesis is suggested;

H2b: *Facilitation learning climate is positively associated with the actual use of educational technology among junior school teachers.*

2.3 Learning Through Reflection

Nikolova et al. (2014a) defined learning through reflection as "the act of acquiring new or expanding existing knowledge, skills, abilities, and other characteristics through reflecting on specific work practices and methods." It is all about providing opportunities and creating circumstances for the employees to perform different work-related tasks efficiently in the best possible way to enhance the productivity of the individuals and the organization (Nikolova et al., 2014a). This gives the perception of blimey and the feeling that one can improve his/her performance by using technology (Sadeghi et al., 2018). The TAM model shows that perceived ease of use indicates that a person would be using technology in the future because they perceive it as easy to utilize (Scherer, Siddiq and Tondeur, 2019). Previous studies focused that learning through reflection enhances performance. For instance, in a study, Huang, Klein and Beck (2020) concluded that learning through reflection enhances the teachers' performance. In another study, Miller, Ford and Yang (2020) found similar results. Moreover, the educational institutions are focusing on rigorously opting for the latest teaching technologies and adorning their departments with the equipment of the technological aid by facilitating their learning process based on positive experience (Sriarunrasmee, Techataweewan and Mebusaya, 2015). Thus, based on these studies, we assume that learning through reflection will give teachers psychological security, so they can be more motivated to introduce innovative activities and embrace technology. Thus, this study hypothesizes that;

H3a*: Learning through reflection is positively associated with the perceived ease of use of educational technology among junior school teachers*

H3b*: Learning through reflection is positively associated with the actual use of educational technology among junior school teachers*

2.4 Learning Through Experimentation

Learning through experimentation is defined by Nikolova et al. (2014a) as the act of acquiring new or expanding existing knowledge, skills, abilities, and other characteristics through experimenting with new working methods and practices. The literature suggests that different experiments can motivate or restrain someone from performing different actions (Bazelais and Doleck, 2018). Qashou (2020) suggests that using a new system or introducing innovation is impossible and may not be effective if it is incompatible with that organization's values, beliefs, and norms. In a study, Alsabawy, Cater-Steel and Soar (2016) showed that IT infrastructure, system quality, and information quality affect the perceived ease of use. In another research, Palumbo and Manna (2019) discovered multiple factors affecting perceived ease of use, i.e., experience, subjective norms, enjoyment, computer anxiety, self-efficacy, etc. Whereas the current study posits that when teachers are given liberty by the school authorities to apply different work methods and find new solutions to various problems and assigned tasks, this liberty works as a motivator to help them perceive that technology is easier to be implemented. Therefore, it is hypothesized that;

H4a: *Learning through experimentation is positively associated with the perceived ease of use of educational technology among junior school teachers*

H4b: *Learning through experimentation is positively associated with the actual use of educational technology among junior school teachers*

2.5 Theoretical Framework of the Study

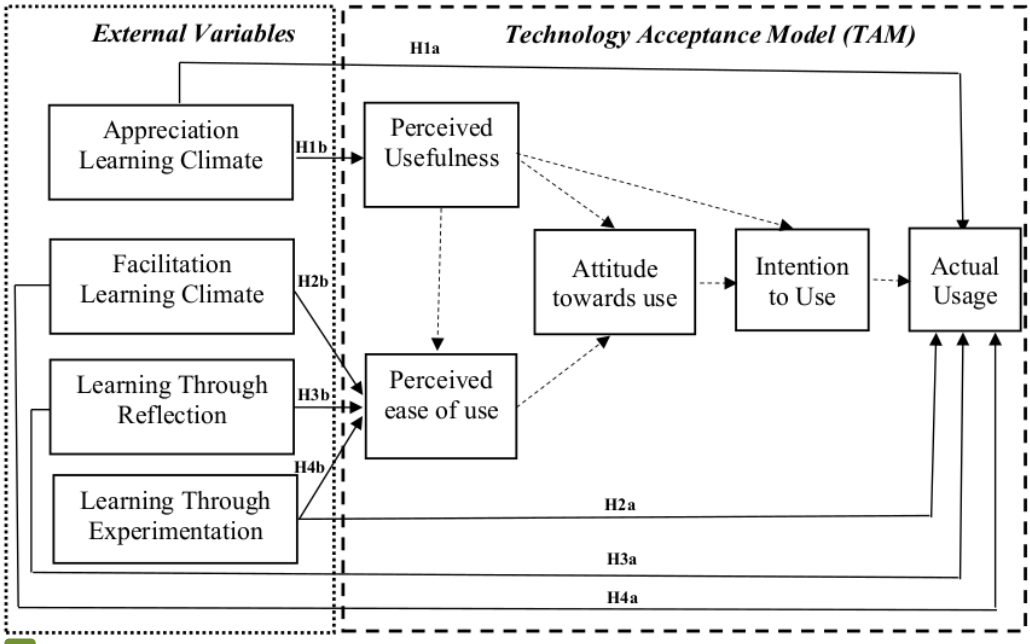

Figure 1: Theoretical framework of the Study

3. Research methodology

To empirically examine the hypothesized links, a quantitative cross-sectional survey was conducted among the junior school teachers of the two cities of Indonesia, i.e., Banjarmasin city situated in South Kalimantan Province and Medan city situated in North Sumatera Province. Researchers used a convenience random sampling technique for data collection. Although longitudinal studies are preferred for measuring the actual usage of the technology, few cross-sectional studies have been conducted previously, which provide useful insights about the phenomenon under investigation in this research framework (Siyam, 2019). The schools' list was obtained along with contact detail of school Headteachers from junior schools headquarter in both cities. Then headteachers were contacted, and their willingness was sought. In total, 38 schools agreed to participate in the survey. After taking consent from the school authorities' and teachers' voluntary willingness to participate in the survey, they were explained about the purpose of the survey. The teachers were requested to complete the survey; also, the anonymity of their responses was ensured. Additionally, to avoid the element of bias, a written note was included in the questionnaire. That was, "*Please fill out the following questionnaire. Keeping the latest technologies, you use in classrooms, indicate your level of agreement or disagreement with the following statements by selecting one of the options. The information provided will be used for research purposes only, and the confidentiality of the respondents will be ensured. Please provide an authentic response; your opinions are valuable to us*". In total, 570 questionnaires were distributed among the participants. The whole distribution of the survey questionnaire and data collection process took approximately three months. Out of 570 questionnaires, 512 were received back, and 32 more were excluded from further analysis due to incomplete responses. Therefore, the remaining 410 questionnaires were included in the current study analysis, with a final response rate of 71.82%.

3.1 Measures of the Study

A questionnaire comprised of 29 items was used to collect data. All the measures were adapted from the previous studies. Appreciation learning climate was measured with a 3-items scale of Nikolova et al. (2014b) with items related to granting rewards to the teachers for developing themselves professionally. The facilitation learning climate was measured with a 3-items scale of Nikolova et al. (2014b) with items related to providing facilities like learning resources to develop the teachers' competencies. Learning through reflection was

measured with a 3-item scale of Nikolova et al. (2014a), with statements like my school provides me sufficient chances to complete my teaching tasks efficiently. Learning through experimentation was measured with a 3-item scale of Nikolova et al. (2014a) with statements like my school provides me opportunities to contemplate different teaching methodologies. Perceived usefulness was measured by a 4-items scale of Davis (1989); perceived ease of use was measured with a 4-items scale of Alharbi and Drew (2014). At the same time, attitude towards usage was measured with a 3-items scale of Masrom (2007) and Alharbi and Drew (2014). Behavioral intentions to use were measured using a 3-items scale of Mathieson, Peacock, E. and Chin (2001). Actual use was measured with a 3-items scale of Moon and Kim (2001). Participants were asked to indicate their level of agreement (for attitudes) or the frequency (for actual usage) on a 5-point Likert scale.

3.2 Demographic Characteristics of the Respondents

The sample characteristics depict that 68.3% of respondents were female, and 31.7% were male. 37.3% of respondents were in the age bracket of 21-30 years, 31.5% were 31-40 years old, 22.2% were 41-50 years old, 9% were above 50 years of age. There were mixed findings in terms of experience, as 24.4% of respondents reported the experience of 1-5 years, 37.2% reported 5-10 years of experience, whereas 23.3% and 15.1% reported 10-15 years more than 15 years of experience, respectively.

4. Data analysis and results

The descriptive statistics, correlation analysis, and one-way ANOVA to find out the information about control variables was performed using SPSS 25. ANOVA results revealed that the respondents' experience had a significant and positive effect on the dependent variable; therefore, the experience was controlled during further analysis to avoid biases in the results.

4.1 Structural Equation Modeling

Besides, Structural Equation Modeling (SEM) was used in SmartPLS 3 software to access the measurement and structural model. The SEM technique applies partial least squares (PLS) with SmartPLS3 to test the full model. The use of smart PLS to analyze study results is because PLS is an alternative to OLS regression. Smart Pls 3 uses partial least squares path modeling analysis (Mansoor, 2021b, Henseler, Ringle and Sarstedt, 2015). Also, it is most suitable when the purpose of research is a prediction or exploratory to run a path model and causal analysis to determine the relationship between variables for hypothesis testing (Arman et al., 2020, Mansoor, 2021a). Since we want to test causal relationships between our predictor and response variable and run mediation, we conducted SEM through SMART PLS 3 (Yuan, Wen and Tang, 2020; Noor, Mansoor and Rabbani, 2021). A two-stage analytical procedure was adopted, i.e., i). the measurement model was tested first to validate the instruments, ii). a structural model was used to examine the hypothesized associations (Noor, Mansoor and Rabbani et al., 2021).

4.1.1 Assessing the measurement model

To investigate the psychometric properties of the measures, confirmatory factor analysis was conducted by using SmartPLS3. "Cronbach's α" and "composite reliability (CR)" were calculated to assess the reliability of measures. Table 1 depicts the reliability of all the reflective measures based on Cronbach's α (above 0.70) and CR. In addition, measures' "convergent and discriminant validity" was assessed (Mansoor and Noor, 2019). As "factor loadings" of all indicator variables were > 0.60 with significant loading of each item ($p < 0.001$) onto its underlying variable and "average variance extracted" AVE of latent variables was above 0.50 for all study constructs, therefore, "convergent validity "was established.

Table 1: Factor loadings, reliability, and validity

Constructs	Loadings	Mean	SD	AVE	CR	CA
Actual Use		4.02	0.41	0.638	0.841	0.809
AU1	0.786					
AU2	0.826					
AU3	0.784					
Intentions to use						
ITU1	0.799	3.90	0.71	0.716	0.883	0.790
ITU2	0.880					
ITU3	0.857					
Attitude Towards Usage		3.74	0.59	0.715	0.882	0.826
ATU1	0.816					
ATU2	0.878					
ATU3	0.842					
Perceived ease of use		4.19	0.37	0.632	0.873	0.797
PEOU1	0.750					
PEOU2	0.818					
PEOU3	0.833					
PEOU4	0.777					
Perceived Usefulness		3.99	0.40	0.568	0.840	0.813
PU1	0.766					
PU2	0.795					
PU3	0.768					
PU4	0.681					
Appreciation Learning climate		3.83	0.67	0.501	0.745	0.775
ALC1	0.682					
ALC2	0.713					
ALC3	0.702					
Facilitation Learning climate		4.07	0.44	0.671	0.859	0.801
FLC1	0.833					
FLC2	0.824					
FLC3	0.800					
Learning Through Reflection		4.23	0.29	0.705	0.877	0.799
LTR1	0.841					
LTR2	0.844					
LTR3	0.833					
Learning Through Experimentation		4.13	0.51	0.767	0.908	0.871
LTE1	0.854					
LTE2	0.892					
LTE3	0.881					

"Note: CR, composite reliability; AVE, average variance extracted."

- Discriminant Validity

Henseler Ringle and Sarstedt (2015) suggested that Heterotrait-Monotrait (HTMT) ratio is a more accurate measure of discriminant validity while using smart PLS. The value of the HTMT ratio should be less than 0.9, as depicted in Table 2 that all values were less than 0.9 for the entire model.

Table 2: Heterotrait-Monotrait Ratio

Constructs	1	2	3	4	5	6	7	8	9
AU	**0.798**								
ITU	0.569	**0.846**							
ATU	0.516	0.611	**0.845**						
PEOU	0.613	0.407	0.449	**0.794**					
PU	0.495	0.458	0.490	0.401	**0.753**				
ALC	0.543	0.592	0.428	0.413	0.402	**0.707**			
FLC	0.591	0.503	0.442	0.318	0.509	0.332	**0.819**		
LTR	0.570	0.618	0.453	0.500	0.428	0.513	0.479	**0.839**	
LTE	0.603	0.559	0.470	0.604	0.611	0.343	0.398	0.620	**0.875**

Note: The square roots of AVEs of the constructs are shown in bold in diagonal. AU= Actual Use; ITU= Intentions to Use; ATU= Attitude Towards Usage; PEOU= Perceived Ease of Use; PU= Perceived Usefulness; FLC= Facilitation

Learning Climate; ALC= Appreciation Learning Climate; LTR= Learning Through Reflection; LTE= Learning Through Experimentation

4.1.2 Assessing the Structural Model

Hypothesized results were confirmed through ß-coefficient, t-value, and p-value. At the same time, overall model fitness or change in the model was measured by a Coefficient of Determination (R^2). The results of the R^2 show that there was a 15.8% change in teachers' perception of the usefulness of the technology due to an appreciation learning climate. Whereas R^2 results also revealed a 51.6% change in teachers' perception of ease of use of the technology due to external factors, i.e., facilitation learning climate, learning through reflection, and learning through experimentation. These values of R^2 represent a good fit for the model with all hypothesized associations. In Table 3, the results presented show appreciation learning climate is positively and significantly related to perceived usefulness (ß = .397***, t=7.131) and actual technology usage (ß = .130**, t=3.118) respectively. In addition, results revealed that the facilitation learning climate is positively and significantly related to perceived ease of use (ß = .252***, t=5.317) and actual technology usage (ß = .213***, t=4.317). Likewise, results further depicted that learning through reflection is positively and significantly related to perceived ease of use (ß = .141**, t=4.227) and actual technology usage (ß = .262***, t=6.806). Finally, a positive and significant relationship of learning through experimentation was found with perceived ease of use (ß = .146**, t=4.159) and actual technology usage (ß = .235***, t=6.738). Therefore, all study hypotheses, i.e., H1a, H1b, H2a, H2b, H3a, H3b, H4a, and H4b, are fully supported.

Table 3: Summary of Statistics of Regression Analysis

Hypothesized relationships		Std. ß	t-value	*p*-value	Findings
H1a	ALC →PU	0.397	7.131	0.000	Supported
H1b	ALC →AU	0.130	3.118	0.013	Supported
H2a	FLC →PEOU	0.252	5.317	0.000	Supported
H2b	FLC → AU	0.213	4.317	0.000	Supported
H3a	LTR → PEOU	0.141	4.227	0.010	Supported
H3b	LTR → AU	0.262	6.806	0.000	Supported
H4a	LTE → PEOU	0.146	4.159	0.007	Supported
H4b	LTE → AU	0.235	6.738	0.000	Supported

4.1.3 Agreement with Original TAM Constructs

Additional paths of the original TAM constructs also revealed positive and significant associations. Moreover, the impact of perceived usefulness, perceived ease of use, and attitudes towards usage on actual usage were also significant and positive. Table 4 lists the results of the associations among the internal variables of the TAM.

Table 4: Additional Regression Analysis Results

Dependent Variable	Independent Variable	Std. ß	t-value	p-value
Actual Use	Perceived Usefulness	0.102	2.235	0.043
Actual Use	Perceived Ease of Use	0.199	4.093	0.000
Attitude Towards Usage	Perceived Usefulness	0.398	7.278	0.000
Attitude Towards Usage	Perceived Ease of Use	0.244	6.542	0.000
Perceived Usefulness	Perceived Ease of Use	0.196	4.975	0.000
Intentions to Use	Perceived Usefulness	0.078	2.932	0.027
Intentions to Use	Attitude Towards Usage	0.243	4.978	0.000
Actual Use	Intentions to Use	0.160	3.534	0.001

It is clear from the analysis that all the results are in line with the findings of Davis (1989) regarding the originally proposed TAM model. Furthermore, the results show that perceived usefulness and ease of use are both predictors of attitudes towards using technology, with a stronger impact of perceived usefulness. Besides, perceived ease of use impacted perceived usefulness. Fig. 3 summarizes the results of all hypotheses links as well as the results of the original TAM model.

5. Discussion, implications, limitations, and future directions

5.1 Findings of the study

This study explicitly aimed at analyzing the impact of external factors (appreciation learning climate, facilitation learning climate, learning through reflection, and learning through experimentation), on acceptance of educational technology, among junior school teachers based on motivation-hygiene theory and the TAM model.

After analyzing 410 respondents' data, the results revealed a positively significant path between junior school teachers' attitudes towards technology. It suggests that teachers' acceptance of the technology is significant in predicting their willingness to use technology. This further shows that teachers believe in integrating technology in classrooms for students learning in this digital age. This study further contributes to the existing literature by adding up the knowledge of the external motivational factors that strongly impact teachers' acceptance and actual use of technology at junior school levels by integrating four vital external variables, as mentioned above. The literature also proposes that extending the TAM with insightful external variables would acumen the technology acceptance (Salas, 2016).

Furthermore, findings related to the path between appreciation learning climate and perceived usefulness have proven to be significant and are in line with the findings of Rudasill et al. (2018). This result predicts that if teachers in junior schools are provided with an environment where they are valued and respected for their efforts, they are more motivated to put in efforts to apply technology and perceive the educational technology as useful. Also, the appreciative learning climate had a significant impact on school teachers' actual use of technology. This comprehends that institutions' consciousness towards external motivation factors, i.e., appreciative attitude and ambiance towards teachers, would result in the actual usage of the technology. The prior study also exhibits that besides the factors that focus on technical issues, cultural factors largely impact technology acceptance and support institutional stakeholders like teachers, students, and staff (Mulenga and Marbán, 2020).

Moreover, results revealed a significant association of facilitation learning climate with perceived ease of use and actual usage. This further implies that schools should provide support and conditions where teachers are motivated and comfortable enough to apply those technologies. These findings also complement the prior studies (Hansen, Saridakis and Benson, 2018, Islahi, 2019). Moreover, learning through reflection was positively associated with perceived ease of use and actual usage. These results show that integrating technology through learning everyday practice and realizing the teachers' abilities to incorporate technology would double the chances of using the technology and thus making way towards the actual usage. This would further enhance the teachers' attitude and intention towards using technology, and they will no more be reluctant to use it. Finally, learning through experimentation has been proven to be positively and significantly related to perceived ease of use and the actual use of educational technology among junior school teachers. These results are in line with the findings of Qashou (2020). This implies that when school authorities provide circumstances for intensive use of experimentation in teaching practices, it makes the chances of technology ease of use pragmatic, resulting in a higher level of motivation and positive attitude of the teachers. It also positively affects their intention to utilize the technology at hand and further incorporate it at a daily pace based on the fact that learning through experimentation is a powerful tool for adopting technology in educational institutions.

5.2 Theoretical implications

This study adds to the existing knowledge and body of the literature by extending the technology acceptance model (TAM) by augmenting external variables related to cultural and contextual perspectives. These external variables, i.e., appreciation learning climate, facilitation learning climate, learning through reflection, and learning through experimentation, give us a deep and better understanding of the fact that there exist variables other than the technical factors that influence technology acceptance, and not only do they depict school teachers' attitude towards technology acceptance but also elaborate on the actual use of technology by suggesting ways to incorporate it. In addition, the current study opted for TAM to explain the attitude of the Indonesian school teachers' acceptance of educational technology. Further, the acceptance of all the hypotheses of this study reflects the theoretical significance of the proposed associations as these four external variables have not been studied before in the literature by their amalgamation with TAM. Therefore, future researchers can derive benefits from the current study and the extension of the TAM from an educational perspective. Finally, this study reveals that with the increasing importance of technology everywhere, educational institutes are also moving towards technology adoption during the teaching and learning process. Thus, using technology has also been enhanced, especially from the teachers at the junior level schools. It also reflects the immense importance of further exploring the other factors that significantly impact the technology adoption to derive the technology-embedded benefits. Additionally, a major contribution of this research is to integrate TAM and Motivation Hygiene Theory in education literature. This kind of theoretical advances and integration is unique in educational literature and motivates future scholars to bridge the gap between e-learning, management, and educational research theories. Moreover, conceptualizing these theories in junior school teacher's settings is another major advance to the body of knowledge.

5.3 Practical implications

Practically, this study extends the knowledge to educational institutions' policymakers and administrative staff to authenticate and imply the motivational factors in the work setting. For the actual use of technology in schools, the authorities can elaborate on its benefits and humongous advantages by conducting awareness programs among the teachers and students and incorporating the technology into the classrooms beforehand. Considering the positive learning outcomes associated with the use of technology, the school's executive controllers and policy formulators should demand school teachers to build up their awareness regarding the technology to use it in classrooms effectively. Furthermore, The principles of the educational institution should encourage and motivate the teachers while giving appraisals and incentives to apply technology in classrooms so that they can polish their skills. Managers should be given awareness about internal and external motivators in the school and classroom environment. It will help and encourage teachers for the requisite knowledge to upgrade themselves up to the mark, and their training should be done accordingly to be ready for a change. In addition, the vital part for the positive teacher's attitude towards the acceptance of technology is played by the main head bodies of the institutions as they should ensure systematic and coherent support in technology usage and providing adequate training. Finally, to successfully implement technology in classrooms, the school administrators should address the users' demands and needs beforehand to acquire technology tools and instruments. In addition to the above, we can draw a few policy insights from the findings of this research, such as the integration of awareness of external motivational factors to school climate. Policy directions to modify and upgrade current environmental checklists for junior schools may enhance junior school teachers' learning, motivation, and effectiveness.

5.4 Limitations and Future Research Directions

Along with many strengths, the current study also has some shortcomings that can generate valuable insights for the policymakers and theorists if addressed in the future. First and foremost is the sample size, which could be expanded compared to the one in this study, as samples always reflect the population, and extension of a sample size could widen the horizon of generalizability. Therefore, the diverse representation of the population is one avenue for future research. Secondly, while implementing and incorporating the designed technologies in developing countries, challenges pop up in various forms with technology acceptance; this could be addressed by adding up some moderators by analyzing the interactive effects in different cultural contexts. Also, because the psychological and cultural factors add up the TAM's validity, augmenting, strengthening, and implementing the analytical and explicative potential of technology-derived models in classrooms could be an interesting path for future research.

Further, this study utilized the cross-sectional design, which can be the limitation of the study. Hence future researchers should collect time wave data by using a longitudinal design. This study tried to bridge the gap between management theories and TAM in education literature. Future studies may also concentrate on conceptualizations and theories from different domains of psychology, organization behavior, knowledge management to be integrated with education research for the better motivation of junior school teachers and enhanced learning outcomes for students. Indonesian study context provided a major strength of this research; theoretically, integrated studies are very rare in this given context. Hence future researchers are welcome to continue this integration in diverse cultural settings and various data settings.

6. Conclusion

Considering the immense importance of technology in learning and teaching, this study aims to advance the existing literature by examining the influence of various external factors, i.e., appreciation learning climate, facilitation learning climate, learning through reflection, and learning through experimentation on the adoption of technology among junior school. This study also integrated the Motivation-Hygiene Theory with the TAM model to explain junior school teachers' attitude, intentions, and actual usage of technology. Data were collected using a cross-section random sampling technique from junior school teachers teaching in schools in Banjarmasin city in South Kalimantan Province and Medan city in North Sumatera Province, Indonesia. Results revealed that junior school teachers have a positive attitude towards using educational technology. Moreover, the study results imply that if teachers in junior schools are provided with an environment where they are valued and respected for their efforts, they are more motivated to put in efforts to apply technology and perceive the educational technology as useful. Also, findings comprehend that institutions' consciousness towards external motivation factors, i.e., appreciative attitude and ambiance towards teachers, would result in the actual usage of the technology. The current study contributed to the body of knowledge regarding examining various external

factors as motivators to adopt the technology. Moreover, integrating the Motivation-Hygiene Theory with TAM Model to explain the attitude, intentions, and actual usage of technology is a unique contribution of the current study. This opens new avenues for future researchers to explore other external stimuli that impact the internal environment of educational institutions via the adoption of technological advancement.

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