Digital Platform Implementation for Teaching Practicum of Teacher Students: Perceptions and used in Classroom Observation

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Abstract
This research aimed to study the perception of digital platform implementation in teachers' teaching behavior and students' learning behavior observation during teaching practicum of teacher students. This research was quasi-experimental research consisting of the use of digital platforms to record data and survey the perception of digital platforms. The target group was 42 second-year teacher students major in Digital Technology for Education, the Faculty of Education, Nakhon Sawan Rajabhat University in Thailand. Research instruments consisted of 1) first was 26-items with 4 components to assessed teachers and students' behavior as well as the learning environment (Srisai, 2002), 2) a digital platform used to display results in real time, and 3) a rating scale for evaluating the perception of digital platforms second was 25-items with 8 components (Lee, 2023). Data were analyzed by Mean, Standard Deviation, repeated measures with t-test, and Pearson' s correlation coefficient. The results of the study demonstrated the applicability of the digital platform to assess teachers' teaching behaviors and students' learning as well as the learning environment over a 3-week period, and also showed a positive relationship between all perception variables.

Keywords: Digital Platform in Classroom, Technology Acceptance, Teacher Students

Introduction

Technology has played a role in life, causing severe disruption, which is both a crisis and an opportunity that educational institutions must adapt intensively. Those who do not adapt or cannot adapt in time may have to close down their educational institutions. Therefore, the learning management system must be adjusted in line with the technology era to prepare for the efficient work of citizens in the future who need to be aware of and understand digital in terms of social aspects of adapting to the daily lives of people in each country (Hempatra et al, 2024).

According to Hart (cited in Kongmanus, 2018) who conducted a survey on the popularity of digital learning tools among individuals, agencies, and organizations from 52 countries around the world from 2007 to 2017.

He found that in our world, there are many types of digital learning tools that are accepted and used, such as Personal & Professional Learning, Educational Management, and Workplace Learning. The developing teacher students to be able to use these technologies as a medium or channel to transfer knowledge and thought processes should develop using technology appropriately skills for the teaching process in transferring knowledge. Teacher students should have skills and understanding in using technology including methods of use, advantages or strengths, disadvantages or weaknesses of each program or application in teaching management, it will make teaching and learning proceed smoothly (Rodniyom, 2021).

The management of teacher education for teaching degrees (Bachelor of Education) will be through production which must be carried out in accordance with the professional standards that the Teachers Council of Thailand has announced that "in the management of teacher education to produce students as teachers, there must be a total of no less than 1 year of teaching experience, with teaching experience from the 1st to the 4th year, with the 1st and 2nd years required to be teaching observations", so that teacher students will learn to observe teachers' teaching behaviors and students' learning behaviors, which will lead to planning teaching management in the 3rd year. Many universities have methods for managing and developing tools to help observe teaching, one of which is the use of digital technology to help students implement it.

In classroom observation, personal productivity tools used to support learning, individual work, facilitate work, and learning in daily life which including recording, storing, creating content, writing flowcharts, mind maps, creating appointments, calendars, maps, translating languages, checking language grammar, and QR Code/PDF File readers for instance, can also be designed as tools used to record teaching observations. This research has proposed the using a digital platform tool in the form of App sheet where teacher students can use it to record data, retrieve data for analysis, and summarize the results of cleanroom observations and can be used the results as feedback to train teaching experiences in the future.

Related Literature

Technology Adoption

In the study of technology acceptance and perceived benefits of use, there are many research studies that implement the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM) as a basis for conducting research. Davis (1985) developed the Technology Acceptance Model (TAM), a famous theory that was accepted as an indicator of the success of technology used. It was an improvement of the theory from TRA (the Theory of Reasoned Action by Ajzen & Fishbein, 1975) with the aimed of studying the factors that motivate and interest individuals in accepting the use of information technology with two important variables: 1) Perceived Ease of Use (PEoU), which means the level at which users expect the system to be easy to use, and 2) Perceived Usefulness (PU) which means that when the system is used, it increases the efficiency of the users. In addition, the theory of innovation and technology acceptance has also found that when users believe in the ease of use and benefits of information technology, it will lead to behaviors of interest, acceptance, and use of information technology.

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed in 2003 by Venkatesh, et al. It is a collection of theories related to the study of various human behaviors. UTAUT is a theory that integrates the concepts of 8 theories: 1) Theory of Reasoned Action (TRA), 2) Theory of Planned Behavior (TPB), 3) Technology Acceptance Model (TAM), 4) Personal Computer Utilization Model (MPCU), 5) Diffusion of Innovation Theory (DOI), 6) Motivation Model (MM), 7) Social Cognitive Theory (SCT), and 8) the combined theory of TAM and TPB (C-TAM--TPB) to find the linkage that leads to the development of an individual technology acceptance and use model under the Unified Theory, which will enable the clearness of the relationship between the factors that appear in the 8 models or theories. UTAUT is used to study usage behavior that is driven by behavioral intention. It consists of 3 factors: 1) Performance expectancy, 2) Effort expectancy, and 3) Social influence. As for the facilities of use (Facilitation conditions) have a direct relationship with use behavior.

For the measurement of efficacy expectancy and social influence, there are four important variables affecting technology acceptance and use behavior, namely 1) gender, 2) age, 3) experience, and 4) willingness to use (Venkatesh et al., 2003).

Later, Venkatesh et al. (2003) further developed the UTAUT theory by adding three factors: hedonic motivation, price value, and habit, resulting in UTAUT2, which focuses on a more specific context, especially the context of consumer technology use, as a result of the ideas of Johns (2006) and Alvesson and Karrenman (2007) who stated that new contexts can cause significant changes in various aspects of the theory. The principle of UTAUT2 is to study behavioral behavior that is driven by behavioral intentions. The factors that influence behavioral intention are 1) performance expectancy, 2) effort expectancy, 3) social influence, 4) convenience of use, 5) entertainment motivation, 6) price value, and 7) habit. The variables are 1) gender, 2) age, 3) experience, except for voluntary use, which was not studied because it was considered that groups like the voluntary group already existed (Venkatesh et al., 2012). Moreover, Bandura and National Institute of Mental Health (1986) mentioned the factors that influence the Behavioral Intention (BI) of individuals as being driven by Self-Efficacy and Outcome Expectation. Based on the principles of Social Cognitive Theory (SCT) in studying the Behavioral Intention of each individual, it will be driven by five factors: 1) Outcome expectation-performance, 2) Outcome expectation-personal, 3) Self-Efficacy, 4) Outcome Expectation, and 5) Anxiety, which are reactions that occur when behavior is displayed, such as using a computer.

In term of the quality of the IT system significantly influences users' perceptions,a high-quality online learning platform enhances user satisfaction which in turn increases the likelihood of users intending to reuse online learning platform. Moreover, the perceived usefulness serves as a full mediating variable between information quality and the intention to reuse online learning applications. This means that even if users perceive the information quality to be high, their intention to continue using the platform is heavily dependent on whether they find it useful. Therefore, demonstrating the practical benefits of the platform is essential for encouraging continued use. The research also highlights that the majority of respondents were students' demographics which play a role in shaping perceptions and intentions. This suggests that educational institutions should consider the specific needs and preferences of their target audience when designing online learning applications. By doing so, they can foster a more favorable perception among users, leading to increased engagement and reuse of the platform (Wiardi et al., 2022). There were suggest that the future research should consider additional factors that influence student experiences in online learning environments.

Classroom Observation

Observing teaching is a popular technique used in educational supervision which always requires the use of observation techniques, but it must be used correctly and appropriately such as observing learning activities in computer class. The results of the observation will reveal the problems in management of learning activities which the supervisor must have in-depth knowledge in computer subject and understand the techniques and processes of teaching computer and be able to provide appropriate advice which teachers can use to improve the quality of learning activities. Therefore, observing teaching is a way to monitor the results of using the learning management plan to organize learning activities, which will affect the quality of learners' learning. In observing teaching, the observer must have knowledge, understanding, and experience in organizing learning activities. Observing teachers' behavior in organizing learning activities while organizing learning activities for learners will allow teachers to develop or improve the efficiency of learning activities by using feedback from observation. In addition, surveying the learning environment is another thing that needs to be recorded because, in addition to teachers, other facilities are also very important for learners' learning (Thammavitheekul, 2009).

Li and Walsh (2023) addressed the challenges of online teaching practicum and highlights how technology can bridge gaps in traditional teacher training, making it relevant for current and future

educational contexts. This mean that the role of technology may promoting teacher noticing which is the ability to observe and interpret classroom interactions critically. This skill is essential for effective teaching and continuous professional growth. According to Yu et al. (2023), there were several key conclusions regarding the development and evaluation of a student-teacher multimodal interaction analysis system for classroom observation. Teaching observation is one of the learning methods that teacher students need to practice experience to develop into individual personalities, which can refer to the theory of social cognitive that emphasizes the "Principle of Observational Learning". It occurs when individuals observe the actions of others and try to imitate that behavior which is learning that occurs in the social environment. We can find it in everyday life, such as speaking, driving, playing various sports, etc. The steps of learning by observation consisted of 1) Attention Phase, if this step is not there, learning may not occur. This is the step where learners pay attention to modeling which the abilities, reputation, and outstanding characteristics of the model will attract learners to be interested. 2) Retention Phase,when learners are interested in the behavior of modeling. They will record what they observe in their own memory system which is usually remembered as an image of the behavioral process. 3) Reproduction Phase, this is the step where learners try to behave like the model which will result in checking the learning that has been memorized. 4) Motivation Phase, this step is the step of showing the results of the action (Consequence) from behaving like the modeling. If the consequences that the modeling has received (Vicarious Consequence) are positive (Vicarious Reinforcement), it will motivate the learner to want to behave. If it is negative (Vicarious Punishment), the learner will tend to refrain from behaving like that. There are three basic principles of social intelligence theory: 1) the learning process must rely on both the intellectual process and the decision-making skills of the learner, 2) learning is a relationship between threeelements (Person, Environment, and Behavior) which have an influence on each other (Bandura, 1986).

From the literature review, researchers have implemented these concepts to the research design, both in terms of developing a digital platform with real-time data visualization response format, and designing it to create observation behaviors, taking record, and data preparation for analysis, as well as displaying teaching observation results which is considered an innovation in teaching and learning in teacher professional experience training subject.

Methodology

This research was a quantitative research by 1) implementation a form for use in filling in or recording data on teacher observations and student learning behaviors, as well as evaluating the learning environment in that classroom using Google Forms, 2) developing a data visualization display to make it easy to display results in real time using Data Studio, 3) conducting observations of teachers' teaching, student learning behaviors, and evaluating the learning environment in the classroom, 4) exploring the acceptance of using the platform using an assessment form.

The target group was 42 second-year teacher students major in Digital Technology for Education, the Faculty of Education, Nakhon Sawan Rajabhat University. The research instruments were 1) the classroom observation survey which contained of 26-items with 4 components (Teacher – Verbal Behaviors 4 items, Teacher – Non-Verbal Behaviors 5 items, Student –Academic Behaviors 6 items, Student -Working Behaviors 3 items, and Learning Environment 8 items) used to assessed teachers and students behavioras well as the learning environment (Srisai, 2002) in Google Form format (Figure 1) and the value for Cronbach's Alpha for the classroom observation survey was α = .684,2) digital platform used to display results in real time (Figure 2 and 3), and 3) the self-assessment of digital platforms perception which consists of 25 questions in 8 components (Computer Self-Efficacy (CSE), Novelty Seeking (NS), Subjective Norm (SN), Perceived Usefulness (PU), Perceived Ease of Use (PEoU), Perceived Enjoyment (PE), Expected Satisfaction (ES), and Situational Motivation (SM) (Lee, 2023) the value for Cronbach's Alpha was α=.987.

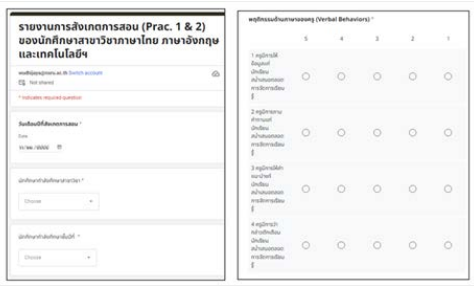

Figure 1 Google Form for Filling the Teaching and Learning Observation

Data collection procedures were as follows: 1) Data collection was between January 4-20, 2025, during the teaching practicum - classroom teaching observation, 2) Students filled in data from each teaching observation, which took 50 to 60 minutes, by filling in data on the Google form (Figure 1), 3) The data that students filled in will be uploaded to the dashboard as shown in Figure 3 in real time, 4) The data that students filled in was obtained from a total of 72 classes, 3 times (3 weeks of teaching observation), 5) After students completed the teaching observation, they had to assess their acceptance of the digital platform (Figure 2 and 3), and 6) The obtained data were analyzed by Mean, Standard Deviation, repeated measures with t-test, and Pearson' s correlation coefficient.

Results

In this section, authors would like to present the results of the data analysis in order, including the presentation of the results of the students' data entry as shown in Figures 2 and 3, followed by the results of the analysis of the repeated measures test, the results of the assessment from the observation of teachers' teaching and the observation of students' learning, as well as the results of the analysis of the Mean and Standard Deviation of each component among digital platform perception and the analysis of the Pearson's correlation coefficient.

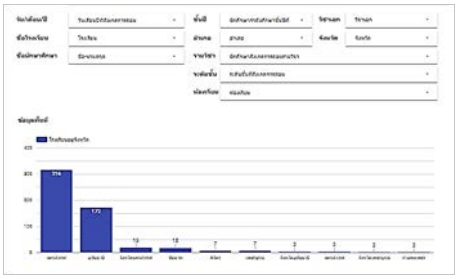

Figure 2 Data Visualization of Teaching and Learning Observation

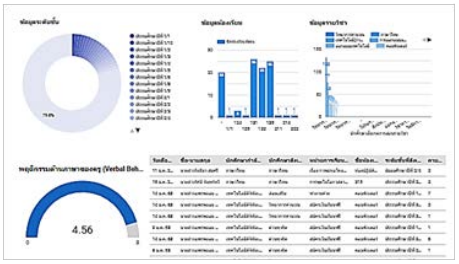

Figure 3 Data Visualization of Teaching and Learning Observation

Table 1 t-Test of Teaching and Learning Behavior

	Teacher-Verbal Behaviors		Teacher-Non-Verbal Behaviors		Student-Academic Behaviors		Student-Working Behaviors		Learning Environment	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Week 1	4.3321	.59393	3.9943	.70524	3.9943	.70524	3.2762	.71102	3.6232	.62969
Week 2	4.4607	.51716	4.1829	.64132	4.1829	.64132	3.3952	.75564	3.6143	.62109
Week 3	4.5536	49066	4.2400	.64839	4.2400	.64839	3.3619	.78583	3.5696	.66302
T-test Week 1 & Week 2	t=-2.101, Sig. =.039*		t=-2.717, Sig. = .008*		t=-.858, Sig. = .394		t= -1.839, Sig. = .070		t= .168, Sig. =.867	
T-Test Week 2 & Week 3	t=--1.901, Sig. =.061		t=-1.035, Sig. = .304		t= 1.062, Sig. = .292		t= .520, Sig. =.604		t= .688, Sig. =.494	

*P < .05

Table 1 shows the results of the repeated measures test between the first and second week and the third week in the observation of teacher teaching and student learning observations as well as the learning

environment found that,in the aspect of Teacher-Verbal Behaviors, Teacher – Non-Verbal Behaviors, and Student-Academic Behaviors, there was an upward trend while Student - Working Behaviors and Learning Environment had a downward trend, with details as follows: In the aspect of Teacher – Verbal Behaviors, the results of the teaching observations reflected that teachers had significantly higher behaviors in this aspect at a statistical level of .05 between first and second week, which was consistent with teachers' teaching behaviors in the aspect of Teacher – Non-Verbal Behaviors as well, while the scores increased in third week but were not statistically significant. And in the Student-Academic Behaviors aspect, it was found that the results of the assessment in this aspect tended to increase between first weeks to third week, but were not statistically significant. On the contrary, the analysis results found that in the areas of Student -Working Behaviors, and Learning Environment, there was a statistically insignificant downward trend.

Table 2 demonstrates the Mean and Standard Deviation of each component. The highest Mean score was Perceived Usefulness (PU) (M=4.6048, S.D.=.43614), followed by Expected Satisfaction (ES) (M=4.6000, S.D.=.41438), and Perceived Enjoyment (PE) (M=4.5762, S.D.=.43550) while the lowest Mean score was Subjective Norm (SN) (M=4.4226, S.D.=.54518). This mean that teacher students had the highest level of exposure to Perceived Usefulness (PU) towards digital platforms while having the lowest level of exposure to Subjective Norm (SM).

Table 2 Mean and S.D. of Variable on Perception of Digital Platform

Variables	N	Mean	S.D.
Computer Self-Efficacy (CSE)	42	4.5000	.45383
Novelty Seeking (NS)	42	4.4762	.43760
Subjective Norm (SN)	42	4.4226	.54518
Perceived Usefulness (PU)	42	4.6048	.43614
Perceived Ease of Use (PEoU)	42	4.5524	.46077
Perceived Enjoyment (PE)	42	4.5762	.43550
Expected Satisfaction (ES)	42	4.6000	.41438
Situational Motivation (SM)	42	4.4429	.47889

Table 3 Correlation Coefficient between Variable on Perception of Digital Platform

Variables	CSE	NS	SN	PU	PEoU	PE	ES	SM
CSE	1							
NS	.762**	1						
SN	.657**	.810**	1					
PU	.448**	.691**	.581**	1				
PEoU	.688**	.641**	.640**	.623**	1			
PE	.518**	.662**	.542**	.797**	.709**	1		
ES	.463**	.491**	.459**	.653**	.777**	.811**	1	
SM	.625**	.651**	.588**	.690**	.810**	.819**	.792**	.750**

** Correlation is significant at the 0.01 level (2-tailed)

Table 3 shows results of the analysis of the relationship between the eight variables of digital platform perception, consisting of Computer Self-Efficacy (CSE), Novelty Seeking (NS), Subjective Norm (SN), Perceived Usefulness (PU), Perceived Ease of Use (PEoU), Perceived Enjoyment (PE), Expected Satisfaction (ES), and Situational Motivation (SM), using Pearson's correlation coefficient, found that the correlation coefficients ranged from .459 to .819. The correlation coefficients between variables with statistically significant values different from zero ($p<.01$) were 29 pairs. The variables with the highest statistically significant relationship were Perceived Enjoyment (PE) and Situational Motivation (SM) (.819). The variables with lowest statistically significant relationship were Subjective Norm (SN) and Expected Satisfaction (ES) (.459) which all pairs had a positive relationship.

Discussions and Conclusions

The results of this research show result of the repeated measures test between the first and second

week and the third week which found that, in the aspect of Teacher – Verbal Behaviors, Teacher – Non-Verbal Behaviors, and Student – Academic Behaviors, showed increase trend while Student - Working Behaviors and Learning Environment had a downward trend. In perception of digital platform, the Mean and Standard Deviation of Perceived Usefulness (PU) showed the highest score while the lowest Mean score was Subjective Norm (SN), and all perception variables were positive relationship. These means that digital platforms significantly enhance teacher and student interaction and feedback in educational settings by providing flexible communication channels and diverse tools for engagement. These platforms facilitate personalized learning experiences, enabling teachers to adapt their feedback and interactions to meet individual student needs. The following sections outline the key aspects of how digital platforms support these interactions.

Digital platforms allow for real-time communication, enabling immediate feedback and interaction between teachers and students, which can be less spontaneous in traditional classrooms (Kizi, 2024). Social media platforms foster virtual communities, enhancing collaboration and peer-to-peer learning outside the classroom (Mehta & Yadav, 2024). Educational apps provide various feedback modalities, including text, audio, and video responses, which cater to different learning styles and preferences (Shoily, 2024). Teachers can utilize apps to monitor student progress and deliver timely feedback, enhancing the learning experience (Muslu & Siegel, 2024). Digital platforms offer flexibility in time and space, allowing students to engage with learning materials at their own pace, which can lead to increased motivation (kizi, 2024; Puspitasari, 2024). However, challenges such as unequal access to technology can hinder effective interaction and engagement, highlighting the need for improved digital literacy among both teachers and students (Puspitasari, 2024).

The research results showed a positive relationship between the acceptance of all pairs of digital platforms tested and found that the pair of Perceived Enjoyment (PE) and Situational Motivation (SM) had the highest relationship, indicating that the more positive students felt about the platform, the more motivation they would have to use it according to the situation. This may be because the platform was designed to be easy to use, with easy and simple data entry. In addition, when students entered data, the platform would automatically process and display it in real-time data visualization, allowing students to immediately receive the results of the evaluation. At the same time, the research results also found that even though all pairs of acceptance factors had a positive relationship, the pair with the lowest relationship level was the pair of Subjective Norm (SN) and Expected Satisfaction (ES). This may be because students who went out to observe teaching in schools still had the concept of observing teaching and recording by writing on paper in the traditional way, which the mentor teachers and teaching supervisors may not see the benefits of integrating digital tools into their work.

The findings of this research simultaneously reinforce earlier studies conducted by Ham et al. (2015) along with Piroth et al. (2020), who discovered that the subjective norm positively and significantly affects ongoing usage behavior. From this, it can be inferred that the subjective norm holds a positive and significant effect on the continuous utilization. Essentially, an improved subjective norm correlates with enhanced behavior regarding the continuous used. Moreover. this finding concurrently reinforces the conclusions drawn in earlier studies by Kotler & Keller (2015) who suggested that subjective norms can enhance favorable attitudes. According to Piroth et al. (2020) who examined how subjective norms affect attitudes and indicating that subjective norms exert a positive and significant influence on attitudes (Sugito et al., 2018). Additionally, several other researchers have reported comparable outcomes, such as Dhanoa and Goyal (2018), Ramkumar and Woo (2017), and Sin and Omar (2020). Thus, it can be inferred that subjective norms positively and significantly impact attitudes of users.In the future research, there may be in-depth research on the characteristics of schools that social norms affect the integrated the digital platform in other work such as for store the student data and analyses in term of learning/ cognitive styles, student background that affect student learning outcome or attitude toward the learning.

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