The Technology Acceptance Model in Enhancing the Effectiveness of Self-Learning in the Disruption Era: A Case Study on Vclass

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ABSTRACT

This study explored the use of technology-mediated self-regulated learning among University of Lampung students using the Vclass Unila platform. Based on a survey of 360 students, the findings were robust and generalizable. The study also evaluated the Technology Acceptance Model (TAM), revealing high student acceptance of the platform's usability and usefulness. Most remarkably, 82 percent of the respondents reported that Vclass Unila is useful in enhancing self-learning by citing benefits such as higher levels of motivation, better time management, and greater independence in comprehending materials. These results are also consistent with the TAM's thrust in the prediction of e-learning systems, creating an argument for enhancements of e-learning systems from the users' perspective. These findings are important as they showcase the capabilities of technology to enhance self-learning, self-regulated and self-directed learning which has been the undercurrent of educational changes. The research has also expanded the existing knowledge on the acceptance of technology in education so as to direct attention to a situation where technology can be used for active engagement with users and promote self-learning in adverse situations.

Keywords
TAM; Self-learning; Virtual class disruption; Acceptance; Vclass; Usability

Introduction

Self-study has become easier and more attractive with the use of e-learning platforms. These platforms, however, need to be adopted fully and used effectively (Patil & Undale, 2023). These platforms, however, need to be adopted fully and used effectively. This paper explores how the e-learning platform Vclass Unila within the University of Lampung implements the Technology Acceptance Model (TAM) to improve self-learning effectiveness. TAM is a common model that helps understand and predict the acceptance of a given technology, arguing that universal acceptance will be based on three main pillars of perceived usefulness, perceived ease of use and usage attitude (An et al., 2024); (Park, 2009), (Patil & Undale, 2023). This paper builds on past studies which have shown a relationship between technology acceptance and self-regulated learning (Park, 2009), (Patil & Undale, 2023), in order to find out if the TAM model is applicable in the concept of Vclass Unila platform focused self-learn.

Various contexts, including virtual learning environments (VLEs), have explored the TAM model. Generally, it is believed that two factors are the primary drivers of the individual's intention to conduct the technology, perceived usefulness (which is the belief that the technology will enhance one's performance) and perceived ease of use (the technology does not require much effort to utilize) (Efiloğlu Kurt & Tingöy, 2017). urther studies emphasize that the acceptance of technology in e-learning systems is crucial and students' readiness to embrace and adopt the technologies in question is fundamental in improving numerous self-learning strategies (An et al., 2024).

These frameworks are useful in explaining the factors that students consider when deciding to use and accept the Vclass Unila. This research builds on earlier research looking into the sustained usage of the e-learning platform by

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college students after its adoption (Patil & Undale, 2023). The nexus of technology acceptance with self-regulated learning (An et al., 2024). The results of such investigations show that ease of use, usefulness, users' pleasure, accessibility and system quality are some of the factors which influence and motivate students toward adopting and using e-learning systems (Patil & Undale, 2023), (An et al., 2024). This study aims to show how the TAM model can be used to improve self-learning effectiveness in the context of the Vclass Unila platform.

TAM is a promising theory that explains how a person or an individual is likely to accept or adopt a certain technology (Avgerinou & Gialamas, 2014), (Gurtner, 2014), (Panigrahi et al., 2018). The main components of the model are the perceived usefulness and the perceived ease of use, which influence a person's disposition toward the technology and, as a result, the intent to use that technology. In the case of wider Vclass Unila, however, numerous authors describe how students adopted the Vclass platform and continued to use it. Different flexible and self-directed learning, collaboration and a higher degree of accessibility for all users (Kim et al., 2021). There has been some academic interest in the role of TAM in relation to Vclass whereby the processes of students' adaptation and acceptance of these educational technologies were investigated (Efiloğlu Kurt & Tingöy, 2017), (McIntyre et al., 2023), (Panigrahi et al., 2018), (Efiloğlu Kurt & Tingöy, 2017), (Lowry et al., 1951). More specifically, the research results indicate that ease of use, usefulness, affection, availability of technology, and quality of the system determine the students' attitude towards Vclass and intention to use them (Efiloğlu Kurt & Tingöy, 2017); (Cardoso & Silveira, 2020).

The present research will be based on Vclass, the e-learning system of the University of Lampung, concerning factors determining the acceptance of technology and evaluating the impact of its features on student academic achievement and satisfaction in regard to self-learning through perceived ease of use, perceived usefulness and effectiveness. A number of studies have recognized technology acceptance model in the elearning sphere focusing on how PU, PEOU, and ATU influences a given student population towards use and continued usage of such technologies (Lowry et al., 1951) (Bizzo, 2022), (Buchanan et al., 2013), (Jabeen et al., 2018). This research has been emphasized how it is important to deal not only with the technological features of the e-learning platforms as quality of the system and accessibility, but also external determinants of students' attitudes and focus, their self-learning integration and the overall technology application in bettering their learning experience (Jabeen et al., 2018), (Lowry et al., 1951), (Aburbeian et al., 2022), (Buchanan et al., 2013). While looking at the functioning of these constructs and how they determine student interaction with Vclass and the likelihood of its use in self-directed study, this study seeks to add to the growing literature on technology acceptance in education contexts and offer practical insights on how e-learning platforms can be redesigned to improve student outcomes.

The activities undertaken during the research do not only apply to the context of Vclass in the premises of the University of Lampung. In the present environment which is characterized by educational chaos and exponential growth of technologies, it is imperative to analyse the possible factors affecting the acceptance of technologies in order to aid educators and policymakers in creating good disposition towards the use of technologies, increasing perceived usefulness and minimizing obstacles towards adoption. The Covid-19 epidemic worked as a trigger for change, even more radically transforming strategies of teaching and learning through the use of technology. Course management systems such as Vclass provide opportunities for flexible, self-paced and stretchable learning which are important in ensuring that education is not disrupted in times of emergencies [11]. A number of studies have indeed examined the application of the Technology Acceptance Model in the context of language and culture through virtual environments, providing insight into its utility and prediction of the outcomes in the use of students of these innovations in learning (Efiloğlu Kurt & Tingöy, 2017), (McIntyre et al., 2023), (Panigrahi et al., 2018), (Lowry et al., 1951).

The findings of this research depict that factors such as ease of use, usability, preference, technology availability, and system quality are particularly important in determining students' perceptions on the use of virtual learning and their intention to employ it (Efiloğlu Kurt & Tingöy, 2017), (Cardoso & Silveira, 2020), (Lowry et al., 1951). Understanding how technology, once accepted, may be employed to transform the educational experience and improve learning outcomes is critical to the successful assimilation of such platforms. The Virtual learning center developed by Universität of Lampung's, that is Vclass, extends the scope of examining the utilization of the technology acceptance model into self-learning in the disruption era. If students' views on the usage and acceptance

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of Vclass are known, then educational institutions will be able to create and integrate virtual learning environments that address the needs and preferences of learners increasing self-learning effectiveness in the disruption era.

Method

The study aimed to explore the use of technology mediated self-regulated learning among students of the University of Lampung who used Vclass Unila platform. A sample size of 360 students was surveyed in what was called robust and generalizable findings. The relevance and the construct validity of the measures were ensured by the survey instrument which was adapted from established studies. The data analysis would look at the interactions among perceived usefulness, perceived ease of use, and attitude towards usage of the Vclass Unila and self-directed learning effectiveness of learners using the platform. It is the hope of the authors of this paper that it will extend the body of knowledge around technology acceptance in e-learning and self-regulated learning by exploring the factors that would influence the acceptance and use of Vclass Unila by students. It aims to investigate how dimensions of the Technology Acceptance Model (TAM) affect students' engagement, learning outcomes, and use of self-learning strategies in the time of educational disruption.

Table 1. Detailed Survey Results

Construct	Indicator	Yes		No	
		n	%	n	%
Perceived Usefulness (PU)					
PU1	Improves understanding of learning materials	290	81%	70	19%
PU2	Enhances learning effectiveness	270	75%	90	25%
PU3	Boosts productivity in self-directed learning	305	85%	55	15%
PU4	Speeds up task completion	230	64%	130	36%
PU5	Improves academic performance	280	78%	80	22%
Perceived Ease of Use (PEOU)					
PEOU1	Easy to understand and use	315	88%	45	13%
PEOU2	Comfortable to operate	280	78%	80	22%
PEOU3	Interaction is smooth	278	77%	82	23%
PEOU4	Requires minimal learning effort	250	69%	110	31%
PEOU5	Features are accessible and operable	325	90%	35	10%
Attitude Toward Use (ATU)					
ATU1	Good choice for self-directed learning	346	96%	14	4%
ATU2	Enjoyable to use	295	82%	65	18%
ATU3	Intent to continue using	289	80%	71	20%
ATU4	Satisfied with experience	315	88%	45	13%
ATU5	Beneficial for learning	330	92%	30	8%
Effectiveness of Self-Directed Learning (EPM)					
EPM1	Increases independence in understanding materials	300	83%	60	17%
EPM2	Improves time management skills	285	79%	75	21%
EPM3	Helps maintain motivation	295	82%	65	18%
EPM4	Enhances confidence in mastering materials	279	78%	81	23%
EPM5	Supports self-directed learning success	320	89%	40	11%

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Table 2. Summary of Research Findings

Construct	Measurement Indicator	Percentage of Positive Response
Perceived Usefulness (PU)	Students finding the platform useful	77%
Perceived Ease of Use (PEOU)	Students finding the platform easy to use	80%
Attitude Towards Usage (ATU)	Positive attitude towards using the platform	88%
Effectiveness of Self-Learning (EPM)	Platform effectively supporting self-directed learning	82%

Results and Discussion

The findings of this study showed the students' perceptions of the Vclass Unila that the majority of these students perceive the platform as useful and easy to use. For instance, 77% of the respondents rated its perceived usefulness (PU) positively, 80% of the respondents felt that it was easy to use (PEOU), and 88% of the students were of the opinion that it would assist them in their studies (ATU). Also, students supported Vclass Unila's contribution to self-directed learning (EPM) and its effectiveness as about 82% of them agreed that it effectively enhanced their independent learning. Such results indicate that the level of acceptance of the platform is high among the students. The aim of the study was to find factors that made the students express the intention to use Vclass Unila even after it was made a requirement during the COVID-19 pandemic. Other studies indicate that there is a positive correlation between students' acceptance of the technology and self-regulated learning which may be attributed to the adoption of new technology enhancing learning behaviors and outcomes (An et al., 2024).

The students' level of agreement with the usefulness and ease of use of Vclass Unila implies that they appreciate the platform's role in enhancing their learning activities and that it is easy and simple for them to use in their studies. The students' strong positive attitude towards the platform (ATU=88%) reveals the willingness of the students to utilize it for their learning. Further, the effectiveness of self-directed learning (EPM=82%) also shows that the students feel that using the platform as a guide for their self-studies is beneficial in a practical sense.

These results corroborate the Technology Acceptance Model which states that the perception of usefulness and of ease of use are important factors in the adoption of a technology. The implications of these results are that these factors are also important to the adoption of e-learning platforms. Moreover, the positive attitudes and the intentions of the users to keep using the platform imply that explaining the TAM principles while designing and marketing an e-learning tool can help to increase user activity and self-regulated learning. These strategies are especially important for today where changes in the educational process threaten its continuity and focus on the need for flexibility and change of the educational space.

In their analysis, Table 1 comprehensively depicts the major findings of this particular study and shows how students resoundingly reacted in support of the Vclass Unila platform. Their surveys indicate that most students find Vclass Unila an important platform and some of the corroborating evidence is presented in Table 1. For instance, 81% of students said that using the platform enhances their comprehension of the learning materials (PU1) and 85% said it enhances their productivity in self-directed learning (PU3). These findings correspond with other studies which

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further show that perceived usefulness is a significant factor in accepting the use of technology in education (Szajna, 1996), (Venkatesh & Davis, 2000).

Perceived ease of use (PEOU) also fetched positive responses: 88 percent of the respondents indicated that the platform is comprehensible and easy to use (PEOU1), and 90 percent claimed that its features were easy to access and use (PEOU5). This supports earlier research pointing out that ease of use is fundamental in enhancing the adoption of e-learning systems (Sánchez & Hueros, 2010). Nevertheless, whereas 78 percent of the students indicated that they found the platform easy to use (PEOU2), a smaller proportion (69%) stated that they had to learn a lot in order to use the system (PEOU4), creating an area of concern for less-than-savvy users with technology.

Resolving such usability issues may enhance the use of the systems, especially among novices who might not be able to cope with the system's learning curve (Sun et al., 2008). The attitudes towards usage (ATU) were mostly favorable; as 96% students thought Vclass Unila would be an adequate environment for self-learning (ATU1). In addition, 88% of the respondents were pleased with the outcome of their interaction with the experience (ATU4) and 92% of the respondents indicated that the platform was useful for their studies (ATU5). These figures reflect not only a measure of acceptance, but also great zeal towards Vclass Unila as far as the learning process is concerned. An intention to continue using the platform was expressed by 80% of the student respondents (ATU3); this emphasizes how the aspect of user experience needs to be looked at closely as it determines the level of subsequent usage and embedding such learning into everyday practice. Emotional involvement in interaction, as claimed by Deci and Ryan (Ryan & Deci, 2000), is one of the most important predictors of long-term user involvement.

Regarding the platform's functionality in relation to EPM, the self-directed learners reported Vclass Unila boosts their independence in understanding materials to a rate of 83% (EPM1) and 89% reported the same as to Vclass Unila's contribution toward their self-directed learning success (EPM5). Also, 82% of respondents said the platform assists in the avoidance of loss of motivation (EPM3) and 78% reported increase in confidence over achieving the learning (EPM4). This finding corroborates with the self-regulation theories by Zimmerman (Zimmerman, 2008) and the important role of technology in students' self-management of learning, a skill that is increasingly becoming essential in learning environments that suffers interruptions too often.

Table 2 elicits the specific details of the responses to the survey questions and emphasizes the predominantly influential factors of the overall acceptance of Vclass Unila. The findings affirm that PU, especially in the productivity benefit and comprehension of the learning material, is one of the most important factors of seeking for technology. PEOU on the other hand was appreciated as an important factor, employers expect high standards in PEOU4, specifically in reducing the amount of training and learning that is required. Offering additional assistance or training may alleviate this issue and would improve the platform's usability and help its accessibility.

Furthermore, attitudes toward usage (ATU), as exhibited by the students in this case, is optimistic as there is a sense of satisfaction and users' commitment as students show that they see the benefits of using Vclass Unila to their learning process. This can be reinforced by the positive and encouraging environment that the platform manages to project which is important in building engagement. By improving the environment that aims to enhance the perception of Vclass Unila as easy and useful, the self-study concept is enhanced and maintained as imperative for student success in the contemporary education system (Ryan & Deci, 2000), (Frick et al., 2012).

However, in spite of this, it is clear that there are some functions, such as increased task execution effectiveness and ease of learning, which still require attention with the aim of enhancing students' satisfaction as well as the utility of the platform. There is also needed to continuously improve elements designed to facilitate effective performance of

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tasks and to provide simple instructions to novice users so as to make it optimal for more types of students especially those who are neophytes in the use of e-learning technologies (Bayraktar et al., 2008), (Selim, 2007).

As such, these results are consistent with the Technology Acceptance Model (TAM), which argues that perceived usefulness and perceived ease of use are key determinants of the adoption of technology (Szajna, 1996), (Venkatesh & Davis, 2000). By improving the features of the platform that promote the efficiency of performing tasks and ease of doing them, Vclass Unila will increase its acceptability among users and confirm its status as a worthwhile device used for self-directed learning. These improvements are very critical during periods of educational turmoil, when, for instance, the e-learning alternatives need to be practical and easy to use. Efforts aimed at sustaining success such as optimizing interface, efficient tasks performance, and easy integration among users could greatly help the platform and position it as a point of reference for other e-learning options (Al-Fraihat et al., 2020).

As well, the data presented in Table 2 of the respondents' survey reveal the components of Technology Acceptance Model that students of Vclass Unila seem to regard highly. Perceived usefulness (PU) turns out to be one of the acceptance sub-scales that produced a favorable outcome with most of the items being accepted within the range of normal to high levels. Specifically, a total of 85 % of the students in this study claimed there was an increase in productivity in self-directed learning, and 81% of the students who participated in the survey indicated that they have managed to understand learning material better than before. This shows that Vclass Unila is not regarded just as a platform for pushing content, but rather a holistic set of tools that aims at complementing the learning experience and improving students' academic performance (Szajna, 1996), (Al-Fraihat et al., 2020).

The survey also brings to the fore some aspects needing improvement. Despite the fact that the system is quite commendable in assisting users to be more effective and comprehend things better, only 64% of the students considered it to help in speeding up the completing of tasks. This implies that some elements could be adjusted to foster more efficient ways of working in order to enhance satisfaction and productivity of the users even further. Removing this gap by improvement of features which allow achieving goals in shorter periods of time can increase the overall perceived satisfaction. In addition, this would further point towards the need for redesigning the interface with the aim of improving the overall experience of students on the platform, which will enhance its attractiveness further (Sun et al., 2008).

The perceived ease of use (PEOU) in a significant way affected the adoption of the platform considering that 88% of the students had no difficulty in navigating the platform while 90% claimed that the operational features were easily accessible. Nevertheless, the relatively low ranking (69%) for minimal learning effort implies that there is room for expansion in terms of reducing the onboarding tasks aimed at enhancing the instinctiveness of the platform to the novice users. Solving these problems may increase the attractiveness of Vclass Unila to wider populations especially those with limited exposure to digital learning. Minimizing the effort a student has to exert in order to learn how to make proper and efficient use of the platform can result in a good tendency to accept the platform, as well as imagine a smooth incorporation of the system into their academic activities. New users or novices could be encouraged to use the platform easily by providing easy comprehensive guides or simple step by step videos which could prepare the user better and faster without getting overwhelmed during the onboarding process (Selim, 2007).

Attitudes towards usage (ATU) turned out to be largely good, where 96% of students considered Vclass Unila appropriate for self- learning, while 92% found it appropriate for learning purposes in general. These findings stress the efficacy of the platform in enhancing the user experience and facilitating independent learning. The high levels of student satisfaction indicate that students do not only use the platform because of the functions but also the pleasant experience they get from it, which helps in retaining the user for a long time. The high percentage of 80% of students who reported an intention to continue using the platform only serves to reiterate the need for a good user experience

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to the students if they are to continue being active participants and integrating the use of the platform to their learning processes. These findings illustrate the relevance of emotional and attitudinal determinants to the utilization of educational technology and also emphasize the need for the students' satisfaction to be maintained at a high level to enhance effectiveness of e-learning platforms (Venkatesh & Bala, 2008).

In terms of the effectiveness of self-paced EPM, students reported reasonable growth in the ability to plan their learning strategies and specify the activities needed to achieve the goals. With 89% of the surveyed admitting the platform enables them to self-direct their learning, and 83% of the respondents claiming to be more self-reliant, Vclass Unila evidently assists in developing essential autonomous learning skills. The platform's role in motivating students and confidence in mastering materials, as noted by 82% and 78% of students respectively, emphasizes this aspect even more to self-regulation and motivation which are necessary for effective learning (Ryan & Deci, 2000). At Vclass Unila, students are assisted in the learning process and as a result develop the ability to achieve educational objectives on their own, which is one of the desirable skills needed in education today (Little, 2007).

As a whole, these results support the Technology Acceptance Model (TAM), which states that perceived usefulness and perceived ease of use constitute two key variables for understanding technology adoption behavior (Szajna, 1996), (Venkatesh et al., 2019). Improving platform characteristics that facilitate task performance and eliminating the need for extensive training has the potential to enhance the acceptability of Vclass Unila as a self-directed learning tool. These modifications are especially significant during periods of educational crisis when flexible, easy to use electronic educational technologies are needed. Efforts of this nature, involving interfaces, processing performance, and the ease of use of the system, are likely to enhance the continued development of the platform and its suitability of being the model of other e-learning platforms. These set of findings are also consistent with other studies of the relationship between technology acceptance and self-regulated learning. The positive relation between technology acceptance and self-learning regulated behavior suggests a need to create a more favorable technological environment for self-learning integration.

Conclusion

Research demonstrates that Vclass Unila has developed an adequate environment in which students can learn at the University of Lampung. Students are finding it useful, easy to use, and are pleased with their encounter which proves its worth for self-directed learning. They point out how crucial students' e-learning engagement and motivation are to effective learning. In particular, students' appreciation of Vclass Unila and their intention to continue using it shows that the system caters for student motivation and engagement. This is an encouraging omen for the platform in the years to come. In order to enhance its efficacy, Vclass Unila has to enhance user experience during the experience its initiation, performance of tasks as well as supporting users. These changes would further promote users' acceptance of the platform and strengthen its status as an appropriate resource for independent learning, especially in the contexts of education interruption.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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