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M-Learning and Learning Autonomy - Needs Analysis and Suggested Model

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Abstract

In this 4.0 era, where technology has been a part of our daily lives, the integration of smart devices into education is an indispensable movement that we are striving for. Hence, the application of mobile devices into learning, M-learning is becoming a trendy approach and a quality assurance's measurement for almost every academic institution. Technology makes education available for students almost anywhere, anytime, and offers unlimited access to learning resources. Furthermore, M-learning is also reported to have a positive impact on students' learning autonomy. Hence, this paper aims at validating possibilities to amplify this aspect of M-learning and suggesting an appropriate M-learning model at Nguyen Tat Thanh university (NTTU). The paper investigates students' needs, requirements, ability to adapt to the new trend of M-learning plus the external elements affecting their learning autonomy to come up with the learning model. Surveys were collected from students in the Faculty of Foreign Languages and analyzed using a qualitative method to provide educators and teachers at NTTU with insightful information and careful preparation before launching new approaches to M-learning.

Keywords: M-Learning, Learning Autonomy, Needs Analysis

1. Introduction

Recently, the Covid-19 pandemic has led to many changes and adaptations in education segment around the world. Firstly, the need for distance learning makes online learning become the main focus of educators to maintain their operation during the pandemic. Many education institutions are investing in enhancing the quality of their online system to meet the requirements of the students and also to make up for the lack of face-to-face interactions. In Vietnam, the pandemic also forces all the students to study at home without direct interactions with their teachers. Hence, the need to learn about the students' requirements and demands for online system is an essential part that determines the quality of education. With the huge amount of young people using mobile phones, M-learning, which was defined as the use of computing mobile devices in learning (Mcconatha, Praul & Lynch, 2008), thus, become a trendy approach for educators to shorten the distance with their learners.

Moreover, the lack of social communication also leads to the decrease of learning motivation due to many a challenge faced by online learning. Without direct interaction with other learners and teachers, students may

lose their interest in learning. Therefore, the impact of M-learning on students' learning autonomy, which has long been confirmed by many authors (Su & Cheng, 2015; Huang, Yang, Chiang & Su, 2016), should maximize its implication during this time. The benefits of M-learning plus the habits of using mobile phones and playing mobile games are the answer for this issue.

In this paper, the authors hope to learn about the learners' needs and requirements for online learning system by assessing their opinions on the current platform, then measure the importance of different external factors on their learning autonomy. The data were collected and analyzed to lend insight for educators in Vietnam and other Asian countries about learners' voices relating to online learning. Then, based on the results of the data, the authors also suggested an appropriate model for M-learning application, which served as a supporting tool for students at home, and in class to improve their learning autonomy. Moreover, the findings of the paper also reassured what has been found by other authors about the influences of external factors on learning autonomy.

The paper is set up to address the following issues:

- (1) Identify students' needs, ability and readiness to adapt to new M-learning system
- (2) Pinpoint factors influencing students' learning autonomy
- (3) Suggest an appropriate model that fits Nguyen Tat Thanh context and can trigger learner's autonomy.

2. Literature review

2.1. Learning autonomy and influencing factors

In response to the development of technology, teachers are no longer mainly in charge of transferring knowledge but more of facilitators directing learners to acquire the new information. Hence, developing learning autonomy skills has become the center of education these days. Many researches were conducted to define and discover the elements influencing learning autonomy as well as its impacts on learners. Entwistle, Thompson, and Wilson (1974) compared learning autonomy as a cleaner that sweeps away challenges and differences rooted in traditional methodologies and educational mindsets.

Researchers are directing their works to identify the factors affecting learning autonomy so that educators can simulate a learning environment that triggers this trait from students. Higgs (1988) pinpointed the four main factors influencing learning autonomy (1) teachers themselves, (2) students' responsibility, (3) tasks, and (4) environment. In 2016, Kemala tested this model, then added the fifth element, which is motivation and changed the second factor of students' roles into materials. Kemala (2016) listed the five elements affecting learning autonomy (1) motivation, (2) social environment, (3) task, (4) teacher and (5) material. In this paper, the questions are designed to test these five factors in the context of Nguyen Tat Thanh University. Therefore, by adjusting external learning conditions and improving interactions among learners, teachers can help enhance students' learning autonomy.

2.2. M-learning and its impact on learners

The popularity of mobile devices and mobile phones among the young generations leads to the flourishing of a new approach to education, which is M-learning – the application of mobile technologies so that learners can learn anywhere and anytime (Lan & Sie, 2010; Girgin, Kurt & Odabasi, 2011). To design a successful application in M-learning, Naismith, Peter, Giasemi, and Sharples (2004) suggested four considerable factors including: (i) the flexibility and operating speed of the application; (ii) accessible and adaptive materials; and (iii) operating fee, and (iv) the use of application as a support to formal education. The qualities of a mobile application in education are also outlined by Miangah and Nezarat (2012) with six elements: (i) the mobility of the device; (ii) social interaction of the application so that learners can exchange information with each other; (iii) contextualization, which means the knowledge in the application is categorized for different purposes and in different situations; (iv) connection, the application can connect to other devices to support learning; (v)

individualization, the application is personalized according to learners' needs and ability; and (vi) popularity of devices and the application.

This paper aims at conducting learners' needs analysis then based on these factors and elements to suggest an appropriate mobile application model that fits Nguyen Tat Thanh University context.

2.3. M-learning in Vietnam and Nguyen Tat Thanh university

In Vietnam, educators are investing into M-learning and making it a trendy approach widely, especially at tertiary levels. Khanh (2014) stated that applying technology in learning languages in Vietnam is necessary as it is essential for learners pursuing higher education or entering the labour workforce. They also emphasized the influences of technological support from universities on students' purposes and attitudes in adapting to the new teaching method. Besides, studying about the factors contributing to the success of technology in teaching is also another focus for researchers in Vietnam. Tran (2016) conducted research about applying technology in teaching in Vietnamese schools using Technology Acceptance Model (TAM). The research concluded that interaction among learners and between learners-teachers is the most important factor determining the effectiveness of E-learning and M-learning in practice.

M-learning at tertiary levels is also examined at Ho Chi Minh City University of Education (HCMUE) by Vu, N.N. Vu (2016) asserted that Vietnam universities are ready to adapt to the modern approach to teaching, which is M-learning as the majority of the students are equipped with mobile devices and the connections to the Internet are quite stable. He found out that though students at HCMUE though initially faced many difficulties getting used to the new system, they could quickly adapt to M-learning, some of them even showed great interest and outstanding talent for utilizing technology in learning. Vu (2016) also pinpointed that students are most interested in the multimedia materials as well as its accessibility, but are concerned about the decrease of interaction with their teachers. Moreover, computer skills also hindered some of the students to further develop using new methods. Hence, Vu (2016) suggested that it was vital for preparing them for the changes by introducing courses before the application of the new system.

However, not many universities in Vietnam focus on building M-learning systems that are intriguing to the students. Moodle is the most popular M-learning system being used with basic functions like online classrooms, testing and storing materials. Nguyen Tat Thanh University is no exception with its Moodle system supporting learning at schools and in pandemic periods.

Therefore, this paper aims at researching learners' needs about M-learning application at Nguyen Tat Thanh University. The data then is analyzed using a qualitative method, which provides insightful perspectives for educators and teachers to develop a new M-learning system at Nguyen Tat Thanh University.

3. Methodology

3.1. Procedure

The project is conducted in six months, lasting from May 2020 to November 2020 at Faculty of Foreign Languages, Nguyen Tat Thanh University, including three stages:

- (1) *Preparing*: identify factors influencing M-learning and learning autonomy, design appropriate surveys
- (2) *Collecting data*: surveys are posted on social media for students to fill in.
- (3) *Analyzing data and suggesting application model*

3.2. Samples

The paper selected randomly 120 students in the Faculty of Foreign Languages, Nguyen Tat Thanh University. To guarantee the number of students from different years joining the research, all the instructors in the Faculty of Foreign Languages were asked to support the authors by sharing and encouraging students in their classes filling the survey. The participants were mainly 18-25 years old. This helps provide diverse insights for the project. After collecting enough 120 forms from the participants, the link to the survey was closed. 112 forms were valid for analyzing after initial filtering.

Information about participants of 112 valid forms were listed in Table 1.

Table 1: The number of participants categorized by genders and year of study at the university

	First year	Second year	Third year	Fourth year	Sum
Male	9	7	12	4	32
Female	16	22	27	10	75
Others	2	0	2	1	5
Sum	27	29	41	15	112

3.3. Instruments

Surveys are used to collect students' perspectives and assess their ability to adapt to new systems at Nguyen Tat Thanh University. The questionnaire includes 20 questions, divided into three main parts:

- (1) Personal information: This part consists of 4 questions relating to name, gender, year of study and age. This information allows the authors to further their understanding about the participants.
- (2) Ability, needs and current situation of M-learning: 8 multiple-choice questions are asked to assess students' perspectives about M-learning.
- (3) Learning autonomy: 8 questions ask students to validate the factors influencing their learning autonomy. This part used a 5-scale Likert measurement to analyze the importance of each factor.

The survey was published on the Faculty of Foreign Languages' social media platform. The post after that was shared on each class' private group by the instructors. After 120 forms were collected, the link was closed. Students who finish the survey will receive a link to download free English books as a thank you gift from the author.

4. Findings

4.1. Needs analysis on students' readiness and requirements for M-learning

The data collected from the students was analyzed using Microsoft Excel and SPSS.

Firstly, students were asked about Internet connection at university and at home.

Table 2: Students' opinions about Internet connection at university and at home

	Very good	Good	Normal	Bad	Extremely bad
How is the Internet connection at your home?	11 9.8%	75 67.0%	22 19.5%	2 1.8%	1 0.9%
How is the Internet connection at NTT University	2 1.8%	59 52.7%	31 27.7%	18 16.1%	2 1.8%

Most of the students have good Internet connections at home with the percentage of more than 75%. Internet connection at NTTU is also reported to be quite good with more than 50% of students choosing 'Good' and 'Very good.' However, there still exist many students who said that the connection at NTTU is not good or normal with the figure of 45%. At NTTU, all the campuses are equipped with wifi connections. However, due to the enormous number of students and the largeness of the campuses, the wifi signal can sometimes be interrupted.

Stable connection both at home and at university is the foundation for developing M-learning, which means, students at NTTU can connect freely to the system without any connection difficulties.

Table 3: Students' habits of using technological devices

	Mobile phones	Laptops/ iPads	Computers (PC)	Not use	Others
Which devices do you use to support your study?	55	38	17	0	2
	49.1%	33.9%	15.2%	0%	1.8%
Which device do you use most frequently?	88	21	2	0	1
	78.6%	18.8%	1.8%	0%	0.9%

Table 3 shows students' habits when using technological devices. More than 80% of the students use mobile phones and laptops/ iPad to study. Moreover, most of the students reported using mobile phones most frequently everyday. As can be seen from the figures, with learners aged 18-25, who were born in the era of technology development, mobile phones are the most popular devices. Learners are familiarized with mobile phones and other technology inventions. There were also 2 students reported to use Kindle in their study. Hence, compared to traditional classes using notebooks and paper coursebooks, students would enjoy the application of technology more. This is a huge disadvantage for educators to integrate M-learning in teaching and learning as students can quickly adapt to the system. Moreover, using mobile phones most frequently, students can maximize their study anywhere and anytime if integrated.

Besides, students' opinions about the current Moodle system at NTTU are also collected.

Table 4: Effectiveness of Moodle system at NTTU

	Very good	Good	Normal	Bad	Extremely bad
What do you think about the effectiveness of Moodle system at NTTU?	6	83	23	0	0
	5.4%	74.1%	20.5%	0%	0%

With more than 80% of the students choosing 'Very good' and 'Good,' the majority of the students are satisfied with the University's system. At NTTU, the Moodle system is used to support online learning. Teachers can upload their materials categorized by topics, organize online classrooms by linking to Google Meet platform, design online tests and discussions, etc. Thus, the system can meet the basic requirements of the students and the teachers, especially in the pandemic periods, where online teaching is compulsory.

However, when asked about developing another new system of M-learning in learning, many students responded that it was necessary.

Table 5: Needs for further development of M-learning

	Very necessary	Necessary	No ideas	Not necessary
Do you think it is necessary to develop another M-learning system to integrate in learning and teaching?	49	55	8	0
	43.8%	49.1%	7.1%	0%

Most of the participants thought it was necessary to develop another system or application in studying. Many students explained their choices in the survey ‘I need a less formal platform to use everyday,’ ‘I need a system to interact with other learners,’ ‘A more exciting system would help,’ etc.

Though the current system provides all necessary functions for online learning, students need a more user-friendly and interesting application that fits their ages and serves also as emotional support when learning.

4.2. Factors influencing students’ learning autonomy

In this part of the survey, the questions focused on identifying positive factors influencing students’ learning autonomy. Students assess the importance of the listed factors on a 5-scale measurement in which 5 points equal to ‘very necessary’ and 1 point means ‘Not necessary at all.’

Table 6: Factors influencing learners’ autonomy

	1	2	3	4	5	Mean
The materials are easy to accessed	0	0	3	48	61	4.5
	0%	0%	2.7%	42.9%	54.5%	
The materials are classified appropriately	0	1	0	29	82	4.7
	0%	0.9%	0%	25.9%	73.2%	
Students can interact with other learners	0	0	0	13	99	4.9
	0%	0%	0%	11.6%	88.4%	
Students can compete with other learners	0	0	3	30	79	4.7
	0%	0%	2.7%	38.4	58.9%	
Students can interact with their teacher easily	1	3	11	32	65	4.4
	0.9%	2.7%	9.8%	28.6%	58%	
Teacher gives clear instructions	0	1	0	78	33	4.3
	0%	0.9%	0%	69.6%	29.5	
The tasks are challenging and interesting	0	0	0	44	68	4.6
	0%	0%	0%	39.3%	60.7%	
The tasks fit learners’ ability and competency	0	0	0	17	95	4.8
	0%	0%	0%	15.2%	84.8%	

Table 6 shows students’ perspectives on factors affecting their learning autonomy. As can be seen from the table, all the factors listed are reported to be important by the students with more than 80% of the students agreeing that all of the factors were necessary or very necessary. It is also noticeable that students emphasized the importance of learners’ interaction to their learning autonomy with the highest mean of 4.9. Meanwhile, the mean of teachers’ instructions was lowest, which can be interpreted as a less influential factor to learning autonomy compared to the others.

Factor 1, which relates to material characteristics, was generally reported to be essential for students to take responsibility for learning. They thought that it was important for the materials to be accessible (mean = 4.5) and easy to use with clear classification (mean = 4.7). This requirement can be easily met with the use of technology and Mobile devices. Compared to classical books in the library, a tiny device can carry such large information and display them categorically according to the designers.

Factor 2 about relationships with other learners receives the highest score with means for interaction and competitiveness 4.9 and 4.7, respectively. Students reported to prefer a class with more interaction among the learners. Competitiveness, though assumed to be stressful for learners, received considerable high scores from the students. It helps students be aware of their level of learning and motivates them to try hard for better results.

Factor 3 was ranked the lowest by the students with the mean of 4.3. This means among the other factors, teachers are the last external factor influencing the students' learning autonomy. However, with an average of 4.3, this is still considered an important element. The role of the teachers nowadays is usually as facilitators, who give instructions and guide the students to conquer the knowledge themselves. Hence, in order to let the students work on their own effectively, the instructions given need to be constructive and clear enough. To support for this factor, the authors suggest the M-learning model to have careful instructions for learning, and how to utilize the application efficiently.

Finally, factor 4 about tasks is also another key element that leads to learning autonomy with the means just after factor 2. To be autonomous learners, students need to be motivated with a sufficient number of tasks. To effectively utilize this factor, it is vital for teachers to design either challenging, interesting and appropriate exercises. With the support of technology, teachers can also integrate traditional exercises with exciting games on mobile phones, which are more attractive due to colorful visual displays.

In general, interaction among learners, easy access to materials and the appropriateness of the tasks attributed significantly to the students' learning autonomy.

5. Discussion

This paper examines the needs and perspectives of the students about M-learning and learning autonomy closely. The findings of the paper indicate that the students at Nguyen Tat Thanh University are willing to adapt to a new system or application employing M-learning in teaching and learning. They are well equipped with Internet connection both at home and at university, this is a necessary condition for applying M-learning. Furthermore, using mobile devices most of the time, they can adapt quickly to the new system on mobile phones. With almost 90% of the students needing another application for their study, it is advisable for the faculty to develop a new approach to M-learning that fits our learners.

Secondly, the factors affecting students' learning autonomy are also pinpointed. Based on the results of the survey, the authors suggest develop an application integrating the learning program with the following structure

- (1) Competitive games for learners to compete with each other
- (2) Library containing learning materials classified by categories
- (3) Leaderboard ranking learners and also analyzing the learners' strengths or weaknesses
- (4) Practice mode provides games categorized by levels for students to practice with the computer
- (5) Learning guide: offer clear instructions and an interaction platform to communicate with the teacher.

The structure allows students to interact and compete with each other via playing games. Learning materials are also included in the application so that students can access and learn every time, everywhere. On the other hand, the library helps provide access and categorize learning materials for students. Besides, students are guided to improve their skills by leaderboard, in which they can identify their strengths and weaknesses. Ranking system is also an element triggering learners' competitiveness so that they will try to study harder to improve their levels. Furthermore, practice mode offers students with choices of which kind of game or which level to practice. Based on the results of the leaderboard, students can develop plans and strategies to practice with the computer to improve their skills. And finally, the learning guide will work as online teachers to instruct students on how to utilize the application in study, how to make the best out the games and how to integrate the application in their formal study at school. Moreover, the learning guide also connects learners with the teachers in emergent cases or when students need it.

The insights from this paper are useful for teachers and educators not only in the faculty of foreign languages but also at Nguyen Tat Thanh University as well as educators at tertiary levels. The study suggests that students at Nguyen Tat Thanh University and in Vietnam are ready for the era of M-learning as they are familiar with mobile devices with Internet connections almost available everywhere. In addition, Vu (2016) 's conclusion about the readiness of Vietnamese students with Internet connection and mobile devices was tested and reported

to be true in the context of Nguyen Tat Thanh University. Lastly, the paper examined the four out of four factors of learning autonomy which are (1) social environment, (2) roles of teachers, (3) types of tasks, (4) materials and (5) motivation (Higgs, 1988; Kemala, 2016). The four factors examined were social environment, roles of teachers and types of tasks and materials. In Vietnamese context, the mean scores of the abovementioned factors were generally high ranging from 4.3 to 4.9. However, compared to the other three, the roles of teachers were listed to be the least important for Vietnamese students.

On the other, there still exist limitations to this study. Firstly, the students conducting the survey were from The Faculty of foreign languages. Hence, it is difficult to generalize the sample for students at Nguyen Tat Thanh in general. Besides, the paper used only one method to collect students' perspectives, which is survey. To deeply understand the students' needs and opinions, it is also essential to conduct interviews and collect diverse individual responses. Moreover, the study can only test for three factors influencing learning autonomy, excluding environmental factors. Finally, the study analyzed perspectives from only one stakeholder, which is students. However, to build a system, the opinions from the university and the teachers should also be put into consideration.

6. Conclusion and suggestions

The paper examines students' needs and readiness to employ M-learning in learning and teaching. In general, almost every student at Faculty of foreign languages and Nguyen Tat Thanh university possesses their own mobile devices which can be used for learning and a strong Internet connection at university and their home. This means the basic conditions for M-learning are met. Moreover, although satisfied with the current system of the university, they are also excited about the new M-learning system, which is user-friendly and more interesting. The results also imply that four out of five factors of learning autonomy (Higgs, 1988; Kemala, 2016) are tested to be valid in Vietnamese context. More interestingly, Vietnamese students regard learners' relationships as the most significant factor leading to learning autonomy. As a country with collective culture, it is possible that the learners in Vietnam will be more comfortable to study with each other. Accordingly, based on the data, the authors suggested a model of M-learning to use at Nguyen Tat Thanh University, which is a mobile application with four modes: (i) competitive games; (ii) library; (iii) leaderboard; and (iv) practice games and (v) learning guide.

However, the paper still has several limitations, which are the size of the sample, the subjects of the study and the factors to be examined. The size of the sample makes it risky to generalize for the whole university. Besides, it has not discovered perspectives from other stakeholders like teachers or the university leaderboard. Finally, the paper excluded the fourth factor, which was 'environment,' when considering the elements affecting learning autonomy.

Further research should be conducted to examine all four factors influencing learning autonomy. The last factor, which is the environment, is also an important element that decides the learners' motivation and emotions. Moreover, researchers can also focus on building a sample application containing the four suggested modes and test its influences on the students' learning autonomy and also academic performances. The application should also be applied in sample teaching and learning to examine its usage' possibility in class. This research, hence, should be a combination of quantitative and qualitative approaches.

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