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THE DRIVERS FOR ACCEPTANCE TABLET BY POSTGRADUATE STUDENTS AND IMPLICATIONS FOR EDUCATION

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ABSTRACT- *Today, technology and education are strongly related. In education, the implementation of technology could increase students' learning and effectiveness of teaching. Tablet is one of technologies that give a big chance to create a portable lesson experience. The portability and ease of note taking of the tablet have attracted students to improve their enhance learning. In Indonesia, tablet technology is moving forward very rapidly. The objective of this study is to examine the driving factors acceptance within the context of students' acceptance of tablet. This research uses the model of the Unified Theory of Acceptance and Use of Technology known as UTAUT developed by [1] and this study extends our understanding of technology acceptance. In this model, performance expectancy, effort expectancy, social influence, and facilitating conditions are key variables that influence user intention and usage behaviour. Proposed model in this study extends previous model which put on price sensitivity as driver that influence behaviour intention. This research was conducted by distributing questionnaires to postgraduate students at Bandung Institute of Technology, Indonesia. We used Structural Equation Modelling to analyze data. The model of UTAUT can be a strategic tool for managers to evaluate chances of success on the emergence of new technology products and useful for marketers in designing sales training program in order to attract new markets of technology lovers. The results validate UTAUT and can be the most salient drivers of acceptance when applied to students in higher education. Also, the result also presents choice of tablet brand and usage behavior of postgraduate students.*

Keywords- Unified Theory of Acceptance and Use of Technology, Technology acceptance, Tablet, Students

I. INTRODUCTION

Education is the process to transmit the values and accumulated knowledge of a society, while other definition states that education is knowledge disseminated from person to other person. The use of technology has contributed giving positive impact for education. If it is used properly, technology could increase the performance of the student. A research by [2] found that after using multimedia technology, knowledge of students when doing research is growing, able to implement theory to best practices, increasing skill of organizational, and more interest in the subject matter.

One of recent technology, which supports the use of multimedia in the class is tablet. A tablet is a piece mobile computer which offers a touch screen, with finger or pen of digital rather than uses mouse and keyboard. Growth of tablet PC devices in Indonesia recorded a proud achievement. Market absorption is increased significantly, even beyond the growth of the laptop or notebook. Based on forbes report Indonesian smartphone and tablets reached to 55% in 2014. Market research firm of International Data Corporation also recorded a massive growth in tablet shipments in Indonesia in 2013. In the second quarter 2013, it recorded an increase of about 100% compared to the first quarter, while in the third quarter recorded a growth of around 50%. According to statista research, at the end of 2014 Android hold the market leader of tablet in Indonesia with market share more than 60% as shown in Fig. 1.

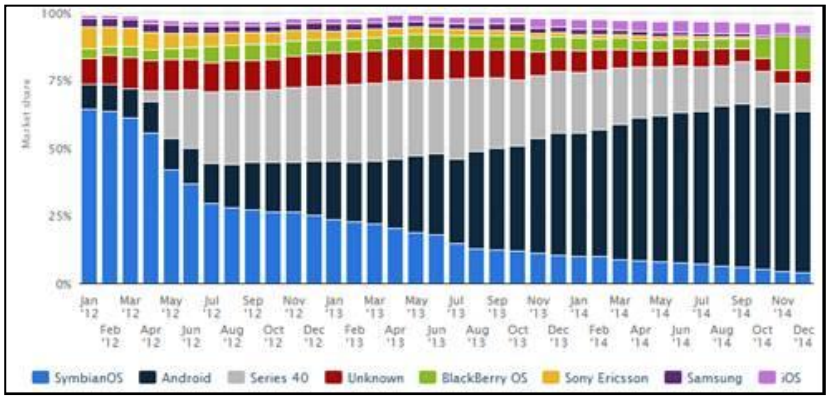


Figure. 1 Indonesia Tablet Market Share by OS, 2012-2014

Changes in lifestyle trends, social media, and need to get connectivity make Tablet can replace notebook and laptop. The portability and ease of note taking of tablet attract many users from different sectors such as manufacturing, construction, healthcare, telecommunication, and education. Now, Tablet is used students both for lifestyle and for improving their education. Tablet has changed students' learning behavior in classroom. Bandung Institute of Technology in Indonesia supports their students to use Tablet

in classroom. Postgraduate students are aware their necessary to use technology to make their study easier.

A study by [1] have identified that after incorporating tablet pc into the learning environment, students feel that their overall learning experience are heightened, learning environment is more interactive and learning materials can be easily accessed anytime and anywhere. Tablet can offers a lot of benefits. Tablet PC is practical to carry anywhere. Users can do the job, play games, chat, to learn anywhere in home, car, work, and waiting room. Tablet offers many applications to support students, for example e-book, Studios (student planner app), skedule, my gradebook: student grades, write (tablet notepad/journal), evernote, iAnnotate PDF, OfficeSuite Pro, Dictionary, so and on. Internet facility in tablet has also been provided for browsing, email, chat, and social networking.

Tablets have reached many customers, unfortunately market in school or university adopted slowly and hard to understand. There are many reasons to answer these issues, might be caused by higher prices, no support from teachers, family, institution, and infrastructure. This background provides us to examine the key to accept of Tablet technology in university.

This study applies Unified Theory of Acceptance and Use of Technology (UTAUT) model developed by [1]. We insert variable price sensitivity in this model. We suggest that price sensitivity is one variable considered by students when they have the desire to use Tablet. This study displays previous studies followed by an overview of our research models and hypotheses. The goal of this study aims to identify factors influencing acceptance of consumer and positive behavioral intention toward Tablet. In this study we also report Tablet brand choice and usage behavior of postgraduate students.

II. LITERATURE REVIEW

In this literature review, we briefly explain about UTAUT model. This research applied model of UTAUT to examine variables that influence students to employ Tablet and implication for their education. Many literature studies can affect the receiving of new product of technology. Technology acceptance literature has many collections of proposed models and theories used to describe information technology innovation adoption [3-1]. To understand technology acceptance of Tablet in education field, we need a model to study this phenomena. Schools have invested a lot of money on computer-based technology to complete school, but only a little positive evidence of such technology on student achievement and classroom practices [4-5]. The use of computer technology in the classroom can improve teaching when is used appropriately [6]. [7]) stated that the model of technology acceptance can give benefit when evaluating competitive products for example technology system and text books. In addition, this model serves a good tool for students and teachers. TAM or Theory of Technology Acceptance Model is used to investigate students' perception of usage, usefulness, and ease of use of web-enhanced instruction or WEI used in Blackboard [8]. The other study, [2] applied TAM model to develop perspective integration to analyse participation of students and involvement in system of e-Learning. In relation to tablets, Other [9] analysed and evaluated faculties who used Tablet by applying the Unified Theory of Acceptance and Use of Technology known as UTAUT. The results found that voluntariness and performance expectancy are the most salient drivers of acceptance for business faculty. In addition, [10]) states that tablet can be useful for faculty in a pilot study. The results showed that educators believe Tablets have an impact on learning, as a whole, only a small proportion using the Tablet and only one third are replacing their notebook with Tablet.

UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT)

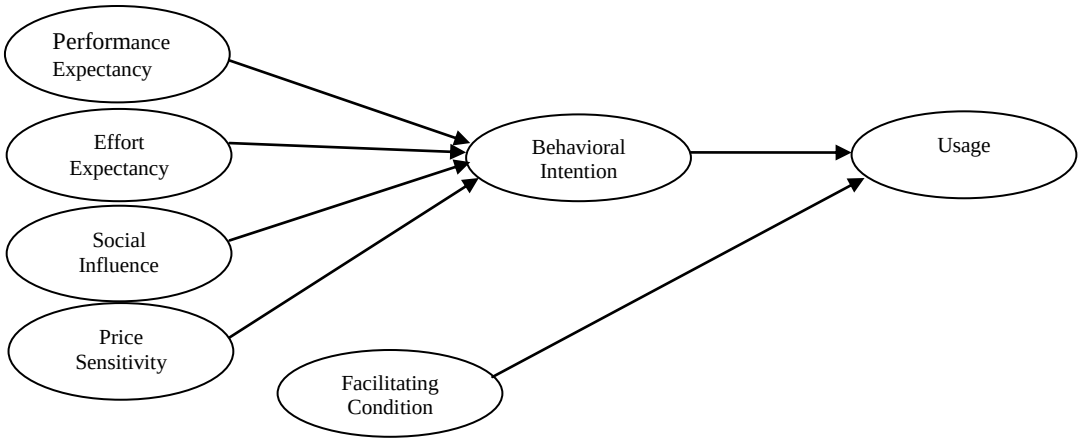
Many scholars made significant attempts in creating theories to investigate and predict the decisive of technology acceptance of user [11- 12]). There are a lot of tools for understanding the many factors influencing consumer acceptance behavior, on social, psychological perspective, such as TRA or the theory of reasoned action, TPB or the theory of planned behaviour. Authors elsewhere [1] strived to improve the predictive ability of the model to identify individuals with equality and utilize the best aspects. They created model of UTAUT. This model is developed to mix eight theories, which enter TAM or the technology acceptance model, IDT or innovation diffusion theory, the motivational model, TRA, TPB, a model combining between the TAM and TPB, PC utilization model and theory of social cognitive. UTAUT used four constructs including performance expectancy, effort expectancy, and social influence and facilitating conditions that affect user when adopting an information technology. The UTAUT model is able to explain about 70 percent of the variance in intention to use technology, far superior variance explained by the eight individual models, which are between from 17 and 42 percent. Given some of the literature is limited to the reception comprehension tablet technology in education; this study is conducted to examine the factors that affect the acceptance of the tablet by the students and their implications for education.

III. RESEARCH MODEL AND HYPOTHESES

According to UTAUT, [1] used four constructs that play a significant role as determinants of user acceptance and usage behaviour: performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). Research hypothesis defined for this study were taken from the original model [1]. This research added variable price sensitivity (PS) as factor that influence intention to use. Four hypotheses studied the effect of the importance of direct determinants such as PE, EE, SI, and PS on behavior intention and two hypotheses like FC and BI employed influence on Usage behavior. Figure 2 shows our model that adapted UTAUT without the moderators (age, gender, voluntaries, and experiences).

Definition of the expectations of performance is the extent to which an individual believes that using the system will help him or improve his performance. In [1] some found performance expectancy to be the strongest predictor in UTAUT. Therefore, we predict a positive connection between performance expectancy and tablet use.

Effort expectancy includes variable perception of ease of use, complexity, and ease of use than previous models, and the level of ease associated with the use of the system [1]. From Innovation Diffusion Theory, ease of use investigated the extent to



H1: Performance Expectancy (PE) will positively affect behavioral intention to use Tablet.

Figure. 2 Research Model

which an innovation is regarded as difficult to use [13].

Complexity, of PC Utilization Model, gauges the perceived difficulty of the system for users [14]. We propose that the effort expectation can lead to a positive relationship with the behavioral intention to use the tablet.

H2: Effort Expectancy (EE) will positively affect behavioral intention to use Tablet.

Social influence is the extent to which an individual perceives that the other person is important to believe when he must use a new system. Others [1] found that social influence has a low positive correlation in UTAUT. Hypotheses relating to the building UTAUT social influences are as follows:

H3: Social Influence (SI) will positively affect behavioral intention to use Tablet.

Price is one of the most important cues are used during the process of consumer decision-making. Prices can be defined as the representation of consumer perception or subjective perception of product price objectives [15] and proposes that encodes consumer and interpret the actual price in a way that is meaningful to them [16]. Related to "overall reaction to the price", price sensitivity can be defined as how consumers feel about paying the price for the victims [17].

Price insensitivity of consumers are willing to pay higher prices for the same goods than the consumer price sensitive and more willing to buy if prices rise [18-19]. Price-sensitive consumers seek lower prices and tend to buy when prices rise. The price level is used to make a big difference in price so as to measure their impact on consumer intentions to use the tablet. Tablets product is a luxury item. So we suggest that tablet buyers are not price sensitive. We propose the following hypothesis:

H4: Price sensitivity will negatively affect behavioral intention to use Tablet

Facilitating condition is the extent to which an individual believes that technical infrastructure and the organizational exist to support the use of the system. Some [1] found that facilitating conditions was a significant predictor of behavior in the use of UTAUT. Thus, we propose that facility conditions will positively affect the Tablet use.

H5: Facilitating Conditions (FC) will positively affect Use of Tablet.

Behavioral intention to use the technology or actual use of technology as dependent variable is often tested in the study of UTAUT. The definition of behavioral intentions is an indication how people are willing to try, how many of them are planning to deploy efforts, in order to perform the behavior [20]. This construct is often used in the Theory of Reasoned Action, Theory of Planned Behavior, Technology Acceptance Model, TAM-TPB Association, and Motivation Model. Based on the large body of research in the literature acceptance of the technology, so we propose behavioral intention will have a significant positive effect on the use of tablet.

H6: Behavioral intention will positively affect Use of Tablet

IV. RESEARCH METHODOLOGY

A. Participants

This study is conducted at Bandung Institute of Technology which have the initiative to use the Tablet. The participants consists of 117 postgraduates of School of Business and Management Department at Bandung Institute of Technology. All participants own Tablet and use the device in class environment.

B. Instrument of Survey

The survey instrument is based on technology acceptance constructs validated in prior research [3] and adapted to the

context of this study. The variables are measured, such as effort expectancy, performance expectancy social influence, facilitating conditions, behavioral intention, and usage. These variables were gauged with a 5-point Likert scale that range from "strongly disagree" to "strongly agree", except usage variable. This research also collected additional information for example gender, age, the number of tablets that they possess, brand choice, and the length of usage.

C. Collection of Data

The survey instrument was delivered using online survey and distributing questionnaires directly to respondents. The survey was conducted during May 2013. The result of the survey respondents is ilustrated in Table 1.

Table 1 Characteristics of Survey Sample

Respondent's Demographic	Category	Percentage
Age	20 – 25 years old	59.8%
	26 – 30 years old	29.9%
	31 – 35 years old	6.8%
	Above 35 years old	3.4%
Gender	Male	48.7%
	Female	51.3%
The number of Tablet owned	One	90.6%
	Two	9.4%
The length of usage	Less than six year	19.7%
	6 months – 1 year	38.5%
	1 – 2 years	37.6%
	2 – 3 years	3.4%
	More than 3 years	0.9%
Brand choice	Samsung	52.1%
	Apple Ipad	36.8%
	Others (Advan, Axio, Huawei, Speed up, Tabulet)	11.1%

V. DATA ANALYSIS

A. Analysis of Measurement Validity

This study used structural equation modelling for the statistical analysis method. We applied two procedures that were recommended by Anderson and [21]). They employ Confirmatory Factor Analysis (CFA) to establish measurement and structural model. The CFA aims to analyse validity of convergent and discriminant from all items with Lisrel 8.70 by using maximum likelihood estimation. Based on the results of CFA, test of the chi-square was significant, $\chi 2$ is 719.98 with 449 degrees of freedom, with $p < 0.05$, and showed that the model is a lack of satisfactory. In addition, we then assessed the fit of model by seeing the variety of model indexes, CFI = 0.907 (>0.9); IFI=0.908 (>0.9); RMSEA = 0.072 (<0.08). Therefore, the conclusion is the CFA model fit with the data reasonably and could be considered in this study.

Table 2 displays standardized loading above 0.5. If viewed from the coefficient lambda, all variables are significant ($t > 1.96$). The values obtained in composite reliability coefficient are above 0.6. The values of the extracted variance analyses (EVA) are above 0.5 so it means that the model fits relatively well. The reliability at between 0.6 and 0.7 is acceptable as long as other indicator of the construct validity is a good model to demonstrate the internal consistency of the measurement model. [22] stated that AVE could be considered as a measure of reliability if it exceeds 0.5. Therefore, items that meet the requirements and have sufficient evidence can be maintained. Discriminant validity is used to check whether the square correlation between the two constructs is lower than the average variance extracted on each construct [22]. The results shows that the validity of the discrimination to be confirmed.

Table 2 Individual Loadings, t-values, Composite Reliabilities (CR) and AVE

Constructs	Items	λ	t-value	CR	AVE
Performance Expectancy	PE1 (Using tablet in my job help me to accomplish tasks more quickly)	0.68	7.92	0.61	54%
	PE2 (Using tablet would improve my education performance)	0.64	7.34		
	PE3 (Using tablet would enhance my effectiveness on learning)	0.64	7.33		
	PE4 (Using tablet would make it easier to do my tasks)	0.80	9.97		
	PE5 (This tablet is useful in my course)	0.80	10.00		
	PE6 (Using tablet in my study would increase my productivity)	0.78	9.60		
Effort Expectancy	EE1 (Interaction with this tablet was understandable and clear)	0.67	7.90	0,88	59%
	EE2 (It was easy to do whatever I want)	0.67	7.92		
	EE3 (Applications on my tablet is easy to use)	0.78	9.77		
	EE4 (I feel easy to learn operating this tablet)	0.86	11.16		
	EE5 (I become skilful at using this tablet)	0.88	11.55		
Social Influence	SI1 (People who effect my attitude opine that I should use tablet)	0.82	9.59	0.87	61%
	SI2 (People who are necessary to me think that I need to use tablet)	0.87	10.26		
	SI3 (The senior in college helped me in the use of tablet)	0.65	7.26		
Price	PS2 (I do not have problem if there is a new product	0.62	5.16	0.62	35%

Constructs	Items	λ	t-value	CR	AVE
Sensitivity	that is likely to be more expensive than the older)				
	PS4 (I do not mind to pay more to buy new technology products)	0.56	4.80		
	PS6 (I do not mind buying new technology products by spending a lot of money)	0.60	5.05		
Facilitating Condition	FC2 (To use Tablet I have enough knowledge)	1.00	15.23	-	-
Behavioral Intention	BI1 (I intend to use the system in subsequent months)	0.90	-	0,93	82%
	BI2 (I predict I will be using a tablet in the following month)	0.91	14.80		
	BI3 (I plan to use the tablet in the next month)	0.93	15.65		
Usage	US1 (Searching for course materials)	0.72	-	0,86	36%
	US2 (Saving data and e-book)	0.64	6.46		
	US3 (Documenting lectures notes)	0.65	6.47		
	US4 (Doing college task)	0.52	5.25		
	US5 (Doing presentation)	0.65	6.56		
	US6 (Communicating each other by e-mail, chat)	0.63	6.28		
	US7 (Sharing files and documents)	0.62	6.18		
	US8 (Extracting or processing data (calculators, converters, formulas)	0.50	5.02		
	US9 (Saving the course schedule)	0.58	5.84		
	US13 (Checking course score)	0.57	5.75		
	US14 (Filling out questionnaire)	0.58	5.85		

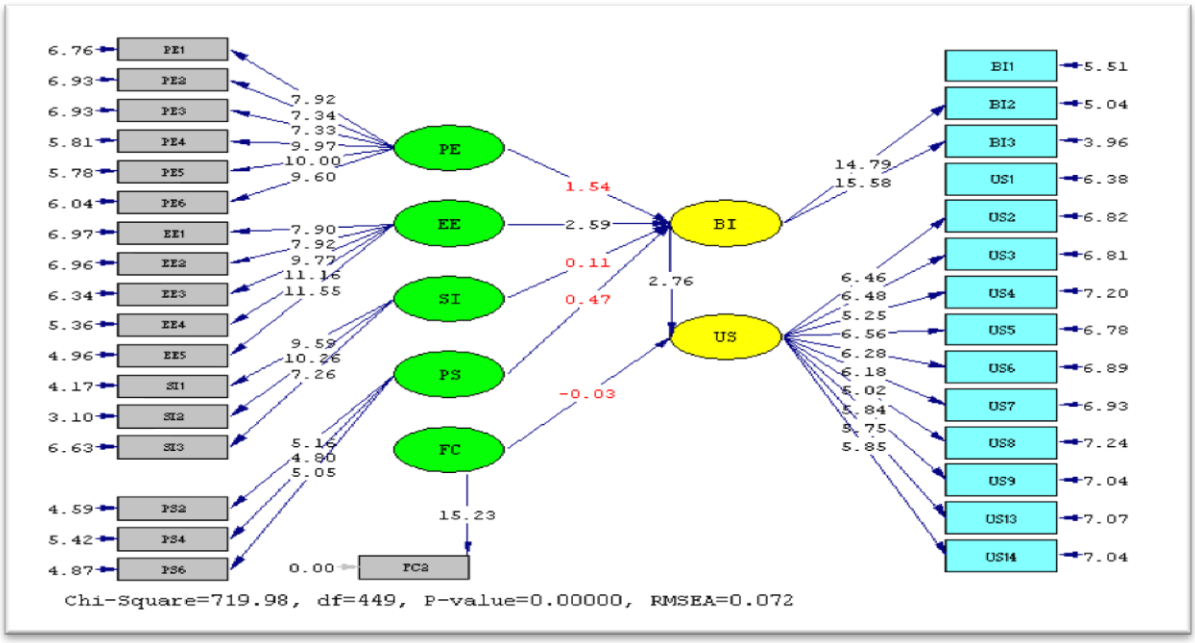


Figure. 3 Structural model

B. **Model Testing Results**

Fig. 3 shows results of structural model. From variance in behavioral intention, perceived usefulness, effort expectancy, social influence explained 17.11%. Behavioral intention and facilitating condition explained 0.83% of variance in usage. We used path significance to hypothesize relationship. Our model supports only H2 ($\gamma = 0.30$, $t = 2.59$, $p < 0.05$) and H6 ($\beta = 0.29$, $t = 2.76$, $p < 0.05$), but does not support H1 ($\gamma = 0.18$, $t = 1.54$, $p > 0.05$), H3 ($\gamma = 0.01$, $t = 0.11$, $p > 0.05$), H4 ($\gamma = 0.06$, $t = 0.47$, $p > 0.05$), and H5 ($\beta = -0.00$, $t = -0.03$, $p > 0.05$). The model shows that effort expectancy affects behavioural intention. However, performance expectancy, social influence, price sensitivity, and facilitating condition do not have effect to use of Tablet.

VI. DISCUSSION AND CONCLUSION

This study takes advantage UTAUT models to investigate the use of Tablets in graduate students. Our analysis suggests a number of findings that are relevance to research and technology management in education context. With respect to salient driver of Tablet acceptance, Effort expectancy has the most direct influence. The students believes that the use of tablet will be easy and effortless. This research is consistent with previous research [11-23-1] that effort expectancy is also a significant determinant of students' acceptance of Tablet. Our research is consistent with prior research [1- 10]

that facilitating condition is found not significant with the use of Tablet. Realizing that effort expectancy and social influence are important variables in user acceptance based on prior research [11-23-1] otherwise we found that our result did not support this theory. The result is consistent with [23] formulated the more robust Theory of Reasoned Action (TRA), behavioral intentions as predictive of usage behavior or actual behavior. The result showed that price sensitivity has positively relationship with behavioral intention. It can be acknowledged that tablet user is also sensitive toward price. This result does not support with previous study [18].

This study shows that Tablet technology has changed students' lifestyle. Previously there are only Personal Computers, then came laptops. Laptops are created to give someone the ability portable. A full laptop is probably the right choice for students as well as workers. The high resolution screen fits big spreadsheets more easily, and higher CPU with more RAM allows people for doing multitasking. After that technology comes with Netbook, it same as a laptop but with less functionality. While Netbook has small screen and keyboard, they increase portability. However, the smaller keyboard might lead to discomfort when typing. Netbook is good for people who just need to check email, read news, find location, but less good if used for serious work. Beside Netbook, Smartphones are found to provide features phones with more computer functionality and connectivity than a regular phone. Phone applications are not able to help people to perform tasks either college or the office in which only has a small keyboard (either physical or on screen). Then the presence of tablet technology has been able to replace the previous technology. Tablet is created to give more computing features of a Smartphone. Tablets are like a Smartphone but in a larger scale with a touch screen interface. With a wide range of possibilities, this tablet phone can provide advantages and disadvantages at the same time. The tablets are a valuable and important piece of educational tool. The tablets are available in different sizes, speed, design and features that one would fit in the needs of the community and they can go anywhere. Advantages that can be obtained from such tablets such as connecting internet from anywhere, doing task, great for note taking, checking email, saving data, good for doing presentation, provide a very powerful audio recording, and longer battery lifetime. In addition Tablet can also be used like a phone used to communicate each other such as phone call, video call and messaging. But, there are some shortcomings of such tablets, compared with Laptop. They have small screen size which are not widely preferred, connectivity via tablet apps are not always as convincing as what promises laptops. Tablets can be very distracting. Once, tablets provide a complete application that allows you to work or to get pleasure. They have the opportunity to be toys. It can be annoying when students play games when learning process in the classroom. However, not a few people think that Tablets are still considered as expensive technology.

From the description results of usage behavior, the postgraduate students explained use tablet to help him/her to do activities namely searching for course material (65.8%), data storing (67.5%), lectures documentation (25.6%), finish their tasks (13.7%), presentations (16.2%), communication such as email, chatting (80.3%), files and document sharing (44.4%), data extraction (28.2%), save the course schedule 38.5%, reminder (41.9%), job seeking (24.8%), check score results (32.5%), and fill out the questionnaires (35.9%). We can see that the students who have been using it as a tablet device that helps facilitate activities in education. Today, some manufacturing companies offer varying rates of tablet priced from under one million rupiah to over 5 million rupiah. So that it is possible for students to have. However, if students have, they must know how to share when it is appropriate to use it for study or for fun. Postgraduate students are encouraged to possess Tablet because a lot of benefits that can be derived to improve their performance in education.

We use technology acceptance model to judge factors that encourage postgraduate students in receiving Tablet. Analysis of the results provide engagement for the development of higher educations. The institutions need to involve in tablet initiatives to students by providing programs aimed at influencing students' behavior intention and perceptions toward Tablet. They can emphasize the utility and show the user-friendliness of Tablet to students. This program will benefit for campus development, system learning between faculty and students become more active and not boring and can motivate students to learn independently.

This study has also provided insighful of brand choice and usage behavior. Almost of postgraduate students use Samsung Tablet as brand choice. Students' preferences show that Samsung with the inception of Android operating system is the most widely use compared to other brands. The result can guide for OS vendors to think why consumers choose and adopt one brand compared to others. We suggest they need to concern of effort expectancy which capture the concept perceived ease of use and complexity. OS vendors should increase belief that consumers when using Tablet can be more relaxed effort, easy to understand and use, and less time to learn a new innovation. This study also provide contribution to application designers to look and investigate what applications students need and want to increase their education performance based on usage behavior above. The postgraduate students also explained that they need applications that able to synchronize with laptop and projector, easiness to access e-book and journal, and share file with lecture (private network for class). In addition, they need other applications such as speech to text application, presentation tool, virtual teacher, mindmap creator, E-library, teleconference, virtual learning, grammar checking, plagiarism checking, and schedules of public transportation.

VII. LIMITATION AND FUTURE RESEARCH

Our research has some limitations. The context of this research was a university setting using only postgraduate students in a department (School of Business and Management). Sample size was another limitation, and only 117 students was participated in the research. If this study would be repeated in the future, we recommend increasing the size of existing sample. Following from model of the Unified Theory of Acceptance and Use of Technology that is

presented here, subsequent research could focus on the identification of the construction that is able to improve the prediction of intentions and usage behaviour. Therefore, we could test larger sample with the moderators in model of UTAUT (such as age, experience, gender, voluntariness). This study advances individual acceptance research by unifying the theoretical perspectives common in the literature. All these limitations and future research considerations can be addressed by extending the study to additional universities and disciplines.

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