# ADOPTION OF WIRELESS FIDELITY(WI-FI) IN CEU: USING UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY MODEL: BASIS FOR MOBILE LEARNING IMPLEMENTATION

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## ABSTRACT

The next big thing is mobile learning. An evolution brought about by the tremendous change in technology. Mobile devices connecting to Internet wirelessly in a breeze 24/7 not only became a fad but more of a necessity. These changes made an impact by reshaping the way we do things. Mobile devices could be a tool to enhance the teaching and learning process.

This research determined if the user would adopt mobile learning by studying the adoption and use of wireless fidelity (wi-fi) in Centro Escolar University(CEU) through the use of Unified Theory Of Acceptance And Use Of Technology Model (UTAUT). The factors that made implementing technology a failure or a success were also identified. The results are used as the basis for mobile learning implementation of CEU in the future.

The Descriptive method and UTAUT model are utilized in gathering data. Stratified Random Sampling is used in selecting respondents. Data were analyzed and treated. Findings show that age and gender when relate to performance expectancy, effort expectancy, social influence and facilitating conditions toward using technology are factors whether the user will adopt the technology.

The study found out that CEU is ready in implementing mobile learning provided adjustment in effort expectancy and facilitating conditions should be made to achieve successful implementation of mobile learning.

**Introduction**

The quest to give an education in a borderless environment is now within the reach of every individual through mobile learning (m-learning). At present, there are 5.3 billion or 77 percent of the world's population is mobile subscribers [1]. This phenomenon was taken advantage by different establishments by installing access points or hotspots to provide additional service to its clientele. Provision for unlimited free access to the internet became a common commodity just like water and electricity. This technological advancement gave birth to m-learning. An additional option to deliver quality education by providing meaningful teaching and learning process is now available 24/7 either stationary or while on the move.

Learning depending on the learner's time and place is what makes mobile learning a famous area to look into by educators and researchers worldwide. M-learning enables the extension of learning such that it weaves itself into a person's work or personal activities, when and where they need it [2]. To join the increasing growth of studies related to m-learning the researcher made use of the Unified Theory of Acceptance and Use of Technology (UTAUT) to study the rate of adoption of wi-fi technology in Centro Escolar University (CEU) and relate it to the adoption of m-learning.

The factors in the adoption of wi-fi technology using the determinants on user intention namely performance expectancy, effort expectancy, social influence and facilitating condition were identified and were used as a basis in implementing m-learning. This study also sought if wi-fi adopters will also adopt m-learning.

**Statement of the Problem**

1. What is the profile of the respondents in terms of:
   - 1.1 age;
   - 1.2 gender;
   - 1.3 experience;
   - 1.4 voluntariness of use?

2. How do the respondents assess the use of WI-FI and m-learning based on the following determinants of user intention?
   - 2.1 Performance Expectancy (PE);
   - 2.2 Effort Expectancy (EE);
   - 2.3 Social Influence (SI);
   - 2.4 Facilitating Conditions (FC);

3. How do the respondents assessments of WI-FI technology and mobile learning in terms of performance expectancy, effort expectancy, social influence and facilitating conditions compare when grouped according to age, gender, voluntariness of use and experience?

4. Is there a significant relationship between wi-fi and m-learning adoption?

**Methods & Procedures**

The Sloven's Formula was used to identify the number of respondents needed in this study. The questionnaire was composed of two parts. The first part is for demographic profiling that includes the age, gender, voluntariness of use and experience. These profiles were considered as the moderating variables. Part II is patterned to the UTAUT model using the determinants of behavioral intention namely performance expectancy, effort expectancy, social influence and facilitating conditions. A marked of .957 or excellent verbal interpretation when the questionnaire was checked for internal consistency using Chronbach's Alpha. 404 questionnaires were distributed among the students and employees in CEU. These were tested and treated using Statistical Packages for Social Sciences (SPSS) application. The following statistical method, frequency distribution, percentage, mean, standard deviation, T-test, Analysis of Variance (ANOVA) and Pearson r to come up with the needed answers to the question posted.

**Theoretical Framework**
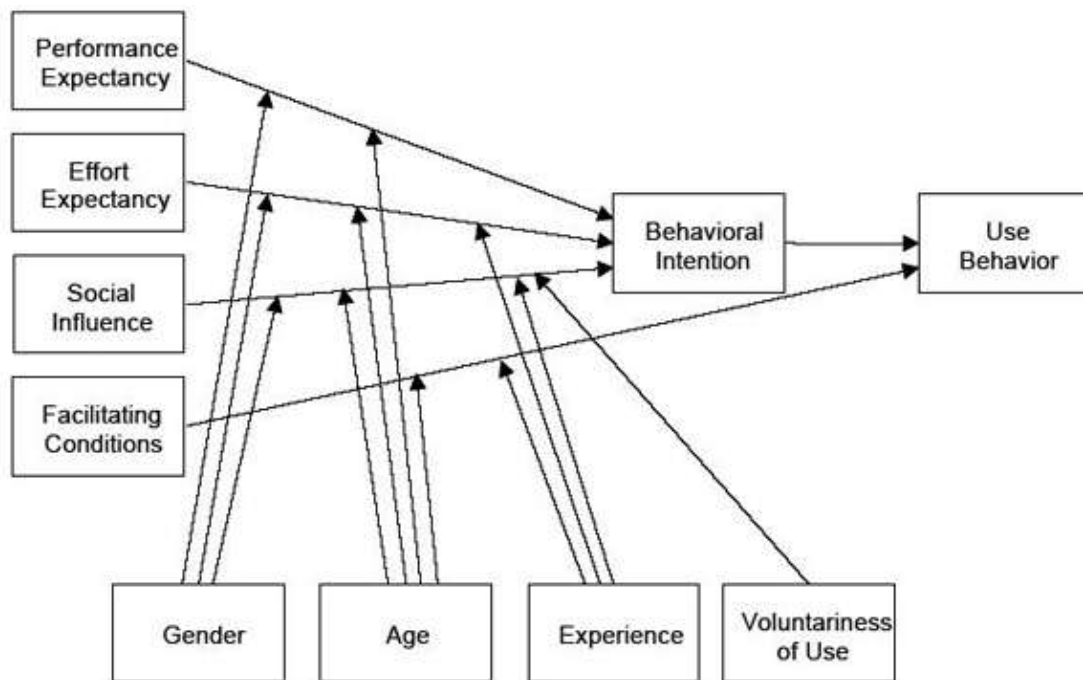


**Unified Theory of Acceptance and Use of Technology(UTAUT)**

**Results**

**Profile Of The Respondents**

Out of 404 respondents, majority of it is within the age ranges from 19 to below or 75.4% percent. The respondents were mostly female, which is in the third year level and consider that the use of wi-fi and mobile learning as voluntary.

# Comparison On The Assessment On The Use Of Wi-Fi And M-Learning

In terms of performance expectancy, respondents perceived that using wi-fi is useful in their study. This helped them in their task to be accomplished quickly and and increases their productivity. The same perception was derived when asked on the performance expectancy of mobile learning.

However in terms of effort expectancy, respondents feel that they will have a hard time connecting and looking for hotspots of wi-fi, but rated mobile learning effort expectancy otherwise. This only shows that signals to connect to wi-fi are too low in some areas in CEU. Mobile learning is higher because respondents would be able to try it out at anytime and in anyplace.

The same with social influence, opinions and suggestions of people who are important to the respondents do not matter when it comes to connecting to wi-fi. However when it comes to mobile learning they value the influence of the people whether they will use m-learning or not. This further validated that Social influence have significant impact on user adoption.[7]

It is noteworthy to say that social influence validated the findings in effort expectancy. Having a hard time connecting to wi-fi and the difficulty looking for hot spots and other negative remarks may be the reasons why individual decided not to suggest connecting to wi-fi among his friends and colleagues. A different scenario in m-learning since the device is on hand, an individual could easily show it among his or her friends how the technology may work. The M-learning impact on individual is more felt compared to wi-fi.

Facilitating conditions for wi-fi and m-learning scored the same; the respondents believed that technical infrastructure such as hardware, software and people resources are available in CEU to facilitate wi-fi connection and m-learning. This shows that CEU administrators are dedicated to provide facilities and services among its clientele particularly those that could help in the teaching and learning process.

## Comparison Of The Respondents' Assessments Of WI-FI Technology In Terms Of Performance Expectancy, Effort Expectancy, Social Influence And Facilitating Conditions When Grouped According To Age Bracket

| | | Mean | SD | F | Sig. | V.I. | Pair |
|---|---|---|---|---|---|---|---|
| Performance Expectancy | 19 below | 2.9973 | 1.19556 | 5.728 | .001 | Very Significant | 19- below VS 40-above & 20-29 VS 40-above |
| | 20 - 29 | 3.3333 | 1.13430 | | | | |
| | 30 - 39 | 3.9545 | .90013 | | | | |
| | 40 above | 4.5000 | .45644 | | | | |
| | Total | 3.1084 | 1.19310 | | | | |
| Effort Expectancy | 19 below | 2.5296 | .98564 | 5.361 | .001 | Very Significant | 19- below VS 40-above 20-29 VS 40-above 30-39 VS 40-above |
| | 20 - 29 | 2.5923 | .96457 | | | | |
| | 30 - 39 | 2.7273 | 1.30602 | | | | |
| | 40 above | 4.5000 | .57735 | | | | |
| | Total | 2.5676 | 1.00415 | | | | |

On wi-fi assessments on the different determinants of user intention, performance expectancy and effort expectancy when grouped according to age are higher on older respondents compared to younger respondents. This result validated the findings of Venkatesh that performance expectancy has a positive effect on intention to use a technology among older respondents.[5]

The data implied that teachers use wi-fi in their job while students' priority in connecting to wi-fi may not be related to their studies at all. The difference on the effort expectancy result is due to access point location. Since wi-fi connections are available in all faculty rooms in CEU, this made it easier for the teachers to use wi-fi, compare to students who need to locate the nearest hot spots just to connect.

When it comes to m-learning the response in performance expectancy, social influence and facilitating conditions reply are almost the same. Younger or older individual perceived that m-learning would help them in their task, infrastructure are available and would listen to people who are important in adapting m-learning. This means that m-learning fits all ages.

On the other hand, only result in effort expectancy found to have a significant relationship when grouped according to age in m-learning. Younger respondents believed that they need to exert extra effort in looking for hotspots to use m-learning.

Agarwal and Prasad in their study identified that several individual differences including level of education and extent of prior experience have significant effects on technology acceptance[3] .With the consolidated result of both wi-fi and m-learning and as a validation of the aforementioned study, this implied that teachers compared with students have higher tendency to adopt m-learning.

**Comparison Of Respondents' Assessments Of Mobile Learning Technology In Terms Of Performance Expectancy, Effort Expectancy, Social Influence And Facilitating Conditions When Grouped According To Age Bracket**

|  |  | Mean | SD | F | Sig. | V.I. | Pair |
|---|---|---|---|---|---|---|---|
| Effort Expectancy | 19 below | 3.3037 | .98543 | 3.182 | .024 | Very Significant | 19-below VS 40-above |
|  | 20 - 29 | 3.5417 | .97316 |  |  |  |  |
|  | 30 - 39 | 3.8182 | .82228 |  |  |  |  |
|  | 40 above | 4.2500 | .50000 |  |  |  |  |
|  | Total | 3.3768 | .98426 |  |  |  |  |

**Comparison Of The Respondents' Assessments Of WI-FI Technology In Terms Of Performance Expectancy, Effort Expectancy, Social Influence And Facilitating Conditions When Grouped According To Gender**

| | Gender | Mean | Std. Deviation | t | Sig. | V.I. |
|---|---|---|---|---|---|---|
| Facilitating Condition | Male | 3.1768 | .88731 | 1.974 | .049 | |
| | Female | 2.9816 | .97008 | | | Significant |

Among the determinants of user intention, only facilitating condition found to have a significant results when grouped according to gender. Wi-fi male users have higher believed that technical infrastructure such as hardware, software and people resources are available in CEU to facilitate wi-fi connection.

This only shows those males are more technology savvy and more aggressive to connect and use wi-fi compared to women. The reason may also be attributed with the advent of action on line games such as DOTA, Online Role-Playing Games(RPGs), Massively Multiplayer Online Role-Playing Games(MMORPGs), Online Shooters, and Free Games which are popular among male.

However there is no significant when respondents' assessments of mobile learning in terms of performance expectancy, effort expectancy, social influence and facilitating conditions when grouped according to gender. This only shows that mobile learning fits regardless of gender.

**Comparison Of The Respondents' Assessments Of Mobile Learning In Terms Of Performance Expectancy, Effort Expectancy, Social Influence And Facilitating Conditions When Grouped According To Voluntariness Of Use**

There is no significant finding on the respondents' assessments of WI-FI technology when grouped according to voluntariness of use and compared with the different determinants of user intention. This means that all respondents have almost the same response in the performance expectancy, effort expectancy, social influence and facilitating condition.

On the other hand, results in mobile learning found to have a significant difference, though respondents perceived that mobile learning bring positive gains in their performance but they do not exhibit voluntariness to use. Moreover they will use m-learning due to social influence and if facilitating condition are in place.

However, their perception on the three determinants will change as suggested by the effort expectancy result. The respondents will not use m-learning if they would have a hard time connecting and looking for hotspots. This may be the reason why self-management of learning was considered as additional construct in UTAUT in the study of Wang, et.al. They found out that it is a significant determinant of behavioral intention to use mobile learning in all respondents.[6] This suggests users should have a technical know how on how to go about the entire process of learning using mobile devices. Familiarity with the devices and user skills has an impact toward acceptance and use of mobile services and technology.[4]

**Comparison Of The Respondents' Assessments Of Wi-Fi In Terms Of Performance Expectancy, Effort Expectancy, Social Influence And Facilitating Conditions When Grouped According To Experience**

| | | Mean | SD | F | Sig. | V.I. | Pair |
|---|---|---|---|---|---|---|---|
| Performance Expectancy | 1st Year | 3.0525 | 1.11944 | 3.294 | .011 | Very Significant | 1 VS 5 |
| | 2nd Year | 3.4645 | 1.24428 | | | | |
| | 3rd Year | 3.0127 | 1.20667 | | | | |
| | 4th Year | 2.9265 | 1.31626 | | | | |
| | Employee | 3.9464 | 1.13162 | | | | |
| | Total | 3.1085 | 1.19753 | | | | |
| Effort Expectancy | 1st Year | 2.5543 | .94596 | 4.152 | .003 | Very Significant | 1 VS 5 |
| | 2nd Year | 2.6968 | 1.01341 | | | | |
| | 3rd Year | 2.4552 | .98122 | | | | |
| | 4th Year | 2.7500 | 1.12152 | | | | |
| | Employee | 3.5179 | 1.31728 | | | | |
| | Total | 2.5675 | 1.00756 | | | | |
| Social Influence | 1st Year | 2.8804 | .97094 | 2.564 | .038 | Significant | 1 VS 5 |
| | 2nd Year | 3.1330 | .95104 | | | | |
| | 3rd Year | 2.7690 | .94394 | | | | |
| | 4th Year | 2.9265 | 1.07079 | | | | |
| | Employee | 3.4286 | 1.0620 | | | | |
| | Total | 2.8800 | .97122 | | | | |

Performance Expectancy, Effort Expectancy and Social influence are higher among teachers compared to the students. This validated the result found in comparing the respondents' assessments of WI-FI technology when grouped according to age bracket. Teachers have higher perception that using wi-fi will helped them in their task like doing research, getting updates on the latest trends on work related matter. This also suggests that students have priority when connecting to wi-fi may not be for his/her studies at all. Updating status in their social media account and online games, contributed to the difference when performance expectancy result is considered between teachers and students.

When experience is compared with the different determinants of user intention, the results implied that there is no significant finding on the respondents' assessments of mobile learning. This only shows that m-learning will fit to any individual be it on students or among teachers.

**Relationship Between The Wireless Fidelity And M-Learning Adoption**

| | | Pearson Correlation | Sig. (2-tailed) | V.I |
|---|---|---|---|---|
| Wi Fi Behavioral Intention | Mobile Behavioral Intention | .511[**] | .000 | Very Significant |

A marked significant relationship in wi-fi adoption was found when relate to mobile learning adoption. This means that wi-fi adopters will most probably adopt m-learning.

**Conclusions:**

**M-Learning Adoption**

1. M-learning would be useful to attain positive gains in user's performance.
2. Users of M-learning would never have a hard time looking for hotspots.
3. Social influence is a factor in adapting m-learning.
4. Technical infrastructure such as hardware, software and people ware to support m-learning in CEU is in place.
5. M-learning will fit on all ages and regardless of gender.
6. Teachers have a higher tendency to adopt m-learning compared with students.
7. Though users perceived that m-learning would bring positive results in their performance, they do not exhibit voluntariness to use.
8. Users would try m-learning due to their perception on performance expectancy, social influence and facilitating conditions, however all these will be meaningless if effort expectancy would not be met.

**Wi-fi Adoption in CEU**

9. Wi-fi is useful to attain positive gains in user's performance.
10. Users exerted extra effort looking for hotspots in CEU.
11. Social influence is not a factor in using wi-fi.
12. Technical infrastructure such as hardware, software and people ware for wi-fi CEU in place.

**UTAUT Validation**

13. Performance expectancy and effort expectancy are higher on older respondents compared to younger respondents
14. Younger respondents believed that they need to exert extra effort in looking for hotspots to connect to wi-fi and m-learning.

15.    On gender differences male users have higher belief that technical infrastructure such as hardware, software and people resources are available in CEU to facilitate wi-fi connection.

**M-learning and Wi-fi.**

16.    Wi-fi adopters will most probably adopt m-learning.

**Recommendations:**

1.    Restructuring of access point for wireless connection that includes cabling, reviewing and or studying location on where best to install hot spots.
2.    Information Dissemination through flyers, signage's, meetings on the hotspots area in CEU.
3.    Consider revision of interfaces when connecting to wi-fi that will fit to lower years.
4.    Create a department whose main task is m-leaning implementation. This department will focus and/or study the following: additional infrastructure needed, creation of policies, creation and or revision of curriculum, content development, and trainings for m-learning implementers that include teachers and staff and other operational issues.
5.    Consider enforcing m learning to teachers and students.
6.    A study on the effectiveness of m-learning in the academic performance of the students.

# REFERENCES

1. Global mobile statistics 2012. (n.d) Retrieved January 5,2012 from MobiThinkingdotMobi Website:http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats

2. ICT in Education: International Mobile Learning for Expanding Educational Opportunities. (n.d) Retrieved January 5, 2012 from Unescodoc Website: http://unesdoc.unesco.org/images/0013/001390/139028e.pdf

3. Agarwal, R. and J. Prasad, "Are Individual Differences Germane to the Acceptance of New Information Technologies?," *Decision Sciences*, Vol. 30, No. 2: 361–391, 1999.

4. T. Koivimäki, A. Ristola, and M. Kesti, "The perceptions towards mobile services: An empirical analysis of the role of use facilitators," Personal & Ubiquitous Computing, vol. 12, no. 1, pp. 67–75, 2008

5. Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003). User acceptance of information technology: Toward a unified view, MIS Quarterly, 27(3), 425-478.

6. Y.-S. Wang, M.-C. Wu, and H.-Y. Wang, "Investigating the determinants and age and gender differences in the acceptance of mobile learning," British Journal of Educational Technology, vol. 40, no. 1., pp. 92–118, 2009.

7. Zhou, T., Lu, Y. B. and Wang, B. (2010). Integrating TTF and UTAUT to explain mobile banking user adoption. Computers in Human Behavior, 26(4), 760-767.