Gender Disaggregated Analysis of the E-Learning Readiness State of Students in a Public Higher Education Institution

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Abstract - **E-learning is not for everyone; in any institutional environment students must be prepared in adopting eLearning. An assessment of the readiness of students is conducted to identify how student will accept changes in learning using technology. The University of the City of Muntinlupa is not only concern with the state of the students they also endeavor equality hence, a gender disaggregated analysis of the e-learning readiness state of the students is essential. The focal intention of this study is to analyze the different factors identified in the literature that supports the success in the e-learning environment and these are: technology skills, technical access and attitudes. The study utilized the quantitative research design. Specifically, a survey research method has been implemented. The sample size of the study is three hundred sixty students from the different year levels and programs of the College of Information Technology and Computer Studies. The two-tailed Analysis of Variance was used in order to determine the existence of any significant relationship between the variables subjected in the study. The findings indicated that in terms of technical access to computer and internet connection, the percentage of female is higher than male, which was also observed in the category of technological skills. Furthermore, the attitude of the students towards learning was also taken into account in this study and the survey quantitatively shows that three out of four sub-categories for attitude presented the male students as obtaining a higher mean value than female, having a verbal interpretation of *Usually*. The categories being referred to are the study habits, abilities, and motivation. When it comes to time management, the survey summary shows that the mean value for female students is higher than the figure for the male, with *Usually* as the interpretation. Finally, it was found out that there is significant difference in how both genders will thrive in an e-learning environment hence the school must look into this when they prepare the e-learning course materials so that both gender will be able to embrace the e-learning implementation of the school.**

Keywords - **Blended Learning, E-Learning, Public Higher Education Institution, E-Learning Readiness Assessment, Technical Skills, Technical Access, Attitude**

I. INTRODUCTION

Educational technology is not restricted to high technology. Nonetheless, electronic educational technology, also called e- learning, has become an important part of society today, comprising an extensive array of digitization approaches, components and delivery methods.

Understanding eLearning is simple. eLearning is learning utilizing electronic technologies to access educational curriculum outside of a traditional classroom from brick-and-mortar. In most cases, it refers to a course, program or degree delivered completely online.

There are many terms used to describe learning that is delivered online, via the internet, ranging from Distance Education, to computerized electronic learning, online learning, internet learning and many others. By definition eLearning as courses that are specifically delivered via the internet to somewhere other than the classroom where the professor is teaching. There is always a teacher or professor interacting and communicating with the students' grading the participation, assignment and tests. eLearning has been proven to be a successful method of training and education is becoming a way of life for many citizens in North Carolina.

In recent years, the knowledge-based economy has exhibited a pervasive and ever-increasing demand for innovative ways of delivering education, which has led to dramatic changes in learning technology and organizations. As the new economy requires more and more people to learn new knowledge and skills in a timely and effective manner, the advancement of computer and networking technologies are providing a diverse means to support learning in a more personalized, flexible, portable, and on-demand manner. These radical changes in learning needs and technology are stimulating a transition in modern learning in the era of the Internet, commonly referred to as e-learning.

The trend brought by eLearning has motivated all sectors of society and institutions around the world. In the Philippines, Information and Communications Technology (ICT) has been transforming the way of life by tearing down borders and making them real. Learning, likewise, has extended beyond the four walls of the classroom and now takes place at home, or anywhere.

In the present situation of Pamantasan ng Lungsod ng Muntinlupa in particular at the College of Information Technology and Computer Studies, the fourth year IT research students is not required to have a regular class meeting and will only have consultation hour with their respective advisers. One of the problems encountered is there's no proper tool for monitoring student's progress in their research. The absence of proper monitoring results to cramming of students in preparing their research works, time is not being managed well and absence of team collaboration. In effect, the CITCS department needs to find way on how to incorporate technology in the course and use a tool that may help the students to have a regular communication with their advisers.

II. RELATED LITERATURE

The Commission on Technology and Adult Learning (2001) defined e-Learning as the instructional content or learning experiences delivered or enabled by electronic technology. eLearning nowadays plays a vital role in the institutions for the improvement for their curriculum instructions. Universities are gradually bringing e-Learning into the mainstream of their educational programs and it is often an integral part of a classroom-based course (OECD, 2005).

Globally eLearning is being accepted and promoted to institutions that wants to improve their education based technology according to McCombs (2005) stated that the rate at which a variety of institutions are entering the distance learning arena is increasing rapidly. Though, Information and Communication Technology (ICT) has been integrated in education in many developing and developed countries as mentioned by Contreras, (2015). But not all institution implementing eLearning had been successful, in a rush to employ e-Learning, many institutions however, are making ominous blunder usually caused by their unfamiliarity with requisites of e-learning. Any attempt to institutionalize e-Learning will prove futile without first attaining its vital requisites (Trinidad, 2002).

In developing an eLearning assessment tool there are issues that need to be considered by the administration, faculty and students. According to (Mercado 2008) a successful e-learning endeavor must always involve a systematic process of planning, designing, developing, evaluating and implementing an e-learning environment where learning and teaching is actively fostered and supported. Other issues concerned where cited in the following literature by Mercado (2008):

Khan (2002) cites issues along eight critical dimensions: pedagogical, institutional, technological, interface design, evaluation, management, resource support, and ethical considerations.

Chapnick (2000) grouped together a wide variety of factors into eight categories that allows practitioners to use the same process to assess the vastly different stakeholders in the system. The factors include psychological readiness, sociological readiness, environmental readiness, human resource readiness, financial readiness, technological skill readiness, equipment readiness and content readiness.

According to Pirani (2004), institutions must provide adequate and reliable technical infrastructure to support e-learning activities, instructors and student must possess the technical skills to use e-learning tools and instructors must redesign their courses to incorporate e-Learning effectively into their pedagogy.

Anderson (2002) looked into five critical success factors--or the five Cs that will help companies make sound e-learning decisions hope to eliminate some failures. The five Cs of successful programs are culture, content, capability, cost, and clients.

Volery (2000) using an empirical study among college students proposed a framework for the critical success factors in online education with emphasis on three aspects in e-learning. These include technology (ease of access and navigation, interface design and level of interaction). Another factor is the instructor along attitudes towards students, instructor technical competence and classroom interaction. The other factor identified is the previous use of technology from a student's perspective.

Tham (2002) cites the framework that discusses critical institutional, technological, and student issues that must be addressed for effective online learning to take place.

Readiness is fortified by the ability to work independently, have self-motivation, mature reading and writing skills, and a proactive approach to learning, as well as a positive attitude about the learning experience in general (Kaminski, et al, 208). The students should try their best to cope up with fast pace of development especially in technology. Success in an e-learning world demands new forms of literacy and expertise of students (Oliver, 2001). This will empower the student to meet with a high level of performance and demand in ICT (Mercado, 2008). The readiness criteria provide a goal for the institution as it develops its capability to implement an online learning environment. It is also important for the institution to meet the high demand of developing technology use as a learning tool (Red, Borlongan, Briagas, Mendoza, 2013).

III. METHODS

To further assess the readiness of students with equality, a quantitative research design was applied using the survey research method in gathering data. The study utilizes this method in the administration of its questionnaire because it is useful in describing the characteristics of large population. Consequently, assessing large sample becomes more feasible, thus making results to be statistically significant even when analyzing multiple variables. The questionnaire composed of two parts, the demographic profile, and the readiness assessment for e-learning, were given to 360 students from different year levels and programs of CITCS and having an equal number of male and

female respondents.

TABLE I
SUMMARY OF RESPONDENTS

Stakeholder	Male	Female
ACT	60	60
BSCS	60	60
BSIT	60	60
Total	**180**	**180**

A review of the different factors considered in the study; technology access, technical skills and attitude was made through the survey. To fully analyze the attitude of the respondents, it was subdivided into four categories; study habits, abilities, motivation and time management. To determine the existence of any relationship between independent variables (gender, age, and attitude) and dependent variables (technical skills, technology access, and readiness), the study applied the two-tailed test Analysis of Variance (ANOVA). A table was presented, computed and interpreted to test the hypotheses of the existence of a significant relationship between male and female, and the non-existence. The survey was conducted in the Pamantasan ng Lungsod ng Muntinlupa, in the College of InformationTechnology and Computer Studies in particular.

The instruments contain a total of 53 questions divided into three (3) parts-technology access, technology skills, and attitude towards elearning. Also, this study is interested in the profile of the students of CITCS by describing their age, gender, year level and program and the students' viewpoints and personal experiences on using the web. The number of respondents was known using Slovin's formula, by analyzing the result gathered through extracting using weighted mean formula and interpretations of data, this method helps further understand if the attitude towards characteristics of successful online student along selected dimensions such as study habits, abilities, motivation and time management.

The instruments used in the study were in likert scale and the scale below was used to interpret the responses of all the respondents by computing the weighted mean as shown in the Table II.

TABLE II
LICKERT SCALE INTERPRETATION

Assigned Points	Verbal Interpretation
4.20 - 5.00	ALWAYS
3.40 - 4.19	USUALLY
2.60 - 3.39	ABOUT HALF OF THE TIME
1.80 - 2.59	SELDOM
1.00 - 1.79	NEVER

IV. RESULTS AND ANALYSIS

Table III shows the students' attitude towards eLearning categories showed a mean of 3.95 in study habits, 4.19 in abilities, 4.03 in motivation and 3.30 in time management were all for male which have the highest mean for students which under the sub-category such as study habits, abilities and motivation which indicate that the students are self-starter, able to communicate effectively with others using online technologies, able to express their thoughts and ideas in writing, and take responsibility of their own learning can be verbally interpreted as usually. Similar with the female students, the students' time management criterion is computed to have the highest mean compare to male. However, there is a need of improvement on the student's study habit for female, and time management for male, since it has shown the lowest mean compared to other categories.

TABLE III
STUDENTS ATTITUDE TOWARDS ELEARNING

	MALE	**Verbal Interpretation**
Study Habits	3.95	USUALLY
Abilities	4.19	USUALLY
Motivation	4.03	USUALLY
Time Management	3.30	USUALLY
	FEMALE	**Verbal Interpretation**
Study Habits	3.41	USUALLY
Abilities	3.45	USUALLY
Motivation	3.43	USUALLY
Time Management	4.03	USUALLY

The results for technology access shows the highest rate which 68.47% own or have an access to a computer, internet connection received the lowest which is 54.10%, and tools with 62.64%as shown in Table IV.

TABLE IV
STUDENTS' TECHNOLOGY ACCESS

Technology Access	YES	NO
Computer	68.47%	31.53%
Internet Connection	54.10%	45.90%
Tools	62.64%	37.36%

Table V shows the technology skills of the respondents in which 91.60% of them have computer skills and the category literacy having the lowest percentage on software application is 77.22%, and basic internet skills having the percentage of 78.64%.

TABLE V
STUDENTS' TECHNOLOGY SKILLS

Technology Skills	YES	NO
Computer Skills	91.60%	8.40%
Basic Internet Skills	78.64%	21.36%
Literacy on Software Application	77.22%	22.78%

To determine the existence of any relationship between independent variables (gender, attitude) and dependent variables (technical skills, technology access, readiness), the study applied the two-tailed test Analysis of Variance (ANOVA). A table was presented, computed and interpreted to test the hypotheses of the non-existence of a significant relationship between male and female.

The table consists of two sources of variation, the gender and attitude. Using a 0.05 level of significance and the computed degree of freedom, the sum of two squares and their mean were computed. Using these values and the total sum of squares will arrive for the computed value of F. Comparing it to the tabular value of 17.4434 which is too much higher will result in rejecting the null hypothesis as shown in Table VI.

TABLE VI
ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Sum of Squares	Computed F-Value
Gender	0.99405	1	0.99405	864.39
Attitude	0.0443	3	0.0148	12.86
Error	0.00345	3	0.00115	
Total	**1.0418**	**7**		

V. CONCLUSION

The study aimed to have the students ready for the implementation of elearning in the University of Muntinlupa. To establish equality in the readiness for both male and female, a disaggregated gender analysis was conducted considering various factors for a successful elearning environment in the university. A quantitative research design was implemented using the survey method to assess the technical skills, technolgy access and attitude of the respondents with regards to elearning. Using the average mean and analysis of variance, a comparison was made between male and female and a significant difference was cited.

The results indicated that there is a difference in the possible behaviour of both genders in an elearning environment. This input will be of great value for consideration in the preparation of elearning course materials so that both genders will embrace and enjoy the implementation of elearning in the university.

The LGU needs to support the enhancement of ICT by providing good infrastructure and fast internet connection in the university. According to Contreras (2015), a deliberate effort should be made to enhance accessibility to be reliable and fast Internet connectivity and other ICT's for learning and research.

eLearning can be applied to the problem stated by using a tool that will best suit for the learning environment of the students and teachers. There is a need for a project management software system for faculty advisers in monitoring the progress of the student's plan and schedule of activities for their research works.

There must be a proper training for the faculty and students for them to improve their skills in using and understanding proper use of eLearning so that students will be motivated to use LMS. The positive result of the study is a good indication to conduct another readiness assessment of the entire university for the eLearning implementation.

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REFERENCES

(Arranged in the order of citation in the same fashion as the case of Footnotes.)

[1] Anderson, T. (2002). "Is E-Learning Right for Your Organization?". <http://www.gc21.de/ibt/en/site/gc21/ibt/permanent/publicforum/dok/is_elearning_right_for_your_organization.pdf>. Accessed 5 October 2008.

[2] Chapnick, S. (2000). "Are you ready for elearning?". <http://www.gc21.de/ibt/en/site/gc21/ibt/permanent/publicforum/dok/are_you_ready_for_elearning.pdf>. Accessed 15 April 2008.

[3] Commission on Technology and Adult Learning. (2001). "A Vision of E-Learning for America's Workforce: Report of the Commission on Technology and Adult Learning". ADSL/NGA Washington, D.C. <http://www.nga.org/cda/files/ELEARNINGREPORT.pdf>. Accessed 1 May 2008.

[4] Contreras, J. (2015). "Assessment in E-Learning Environment Readiness of Teaching Staff, Administrators, and Students of Faculty of Nursing-Benghazi University". International Journal of the Computer, the Internet and Management Vol. 23 No. 1 (January-April, 2015) pp. 53-58.

[5] Red, E.R., Borlongan, H.G.S., Briagas, T.T., and Mendoza, M.J.M. (2013). "An Assessment of the eLearning Readiness State of Faculty Members and Students at Malayan Colleges Laguna". International Journal of the Computer, the Internet and Management Vol. 21 No. 3 (September-December, 2013) pp. 20-26.

[6] Kaminski, J. and et. al. "Planning your Online Course". Educationfor a Digital World. <http://www.colfinder.org/materials/Education_or_a_Digital_World/Educaiton_for_a_Digital_World_part2.pdf>. Accessed November 2008.

[7] Khan, B. (2002). "The Global e-Learning Framework: An Interview with Badrul Khan". <www.kfupm.edu.sa/dad/deanship/events/workshops/material/ws041002/../07%20The%20Global%20eLearning%20Framewo rk.doc>. Accessed May 2008.

[8] Mercado, C. (2008). "Readiness Assessment Tool for an E-Learning Environment Implementation". Special Issue of the International Journal of the Computer, the Internet and Management, Vol. 16 No. SP3, December, 2008. <http://www.elearningap.com/eLAP2008/Proceedings/18_fullpaper_cecilia%20Mercado_Revised.pdf>.

[9] Mccombs, B.L. "A Learner-Centered Framework for E-Learning". Teachers College Record Vol. 107, No. Aug 2005. <http://edtech.boisestate.edu/elearn/advEDTECH597/McCombs(2005).pdf>. Accessed May 2008.

[10] Pirani, J. (2004). "Supporting E-Learning in Higher Education". Educause Ceter for Applied Research. <http://net.educause.edu/ir/library/pdf/ERS0303/ecm0303.pdf>. Accessed August 2008.

[11] Tham, C. (2002). "Designing and Evaluating Elearning in Higher Education: A Review and

Recommendationa". Elearning in Higher Education. <http://cobacourses.creighton.edu/MAM/2002/papers/Tham.doc>. Accessed 15 May 2008.

[12] Trinidad, A.C. (2002). "An initial assessment of Philippines'preparedness for e-learning". Kasarinlan: A Philippine Journal of Third World Studies.