

Adoption of Information and Communications Technology: An Evidence of Teacher Education Institutions in Davao City

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Abstract: This dissertation investigated the rate of ICT adoption of Teacher Education Institutions (TEIs) in Davao City. Specifically this research was conducted in order to determine the status of ICT institutional factors and the status of ICT adoption of TEIs in Davao City, to determine the behavior and reasons of teachers in adopting ICT and to identify the factors that best affect the rate of adoption.

The study used a questionnaire adapted from Becta School and a self survey assessment tool to gauge the ICT mark threshold of the different schools. A Contingent Valuation Method was used to determine the behavior of teachers in adopting ICT and Probit model in order to determine the factors that affect the rate of ICT adoption.

In the findings of the study, the factors that affect the rate of adoption are the years in using ICT, educational background and accessibility to teachers.

Key words: ICT, adoption, teacher education institutions, ICT Mark Threshold, contingent valuation method

1. Introduction

The momentum of the technological revolution creates rapid and disruptive changes in the way in which people live, work, learn and play. As the pace of technological advance shows no sign of slowing, the challenge is in learning to adapt to changes and to prepare people to work with new technologies competently and confidently. (Future Trends in Technology and Learning)

All of the ten countries in Asia such as Cambodia, India, Indonesia, Laos, Sri Lanka, Thailand, Vietnam, Philippines, Malaysia and China have national policy on ICT. While for the educational technology standards for teachers only China was able to finish it, Philippines and Malaysia are on the process of making it happen (Situational Analysis of TEIs on ICT Integration).

As in most other areas of modern life, computers and technology have had an important impact on higher education. For more than four decades, information technology has played an important role in the structure of schools and universities (Sherry & Gibson, 2002) and information technologies are widely available on university campuses. For example, approximately three-fourths of higher education institutions provide technology-based course management tools to their faculty (The Campus Computing Project, 2001). With technology more available on campuses, the integration of technology into teaching and learning in higher education has become more and more crucial since technology has the potential to reinforce the core of teaching and learning (Green &

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Gilbert, 1995). In fact, “if higher education wants to survive in the expansion of technology, then it must be prepared and must prepare its faculty to implement the new technologies within their classrooms” (Hagenson, 2001, p. 2).

Everybody is talking about technology integration, investing so much on it but few practicing teachers profess to know exactly how to proceed. The fact is that real integration requires change However, what seems to be lacking is a model that teachers can use to guide them through the necessary changes they will need to make to be successful in integrating new technology into their classroom (Johnson & Liu, 2000, p. 4).

In the Philippines, the move for K to12 paradigm implementation created a big leap in the change of our educational system. As what the Secretary of Education Armin A. Luistro said in his speech during the 4th National Convention of the Centers of Excellence, Centers of Development, Centers of Training and Association of Local Colleges and Universities last April 11-12, 2011 at Bataan, “If our TEIs are not yet teaching in a revolutionary pedagogy using Information Technology as a backbone in teaching and learning, then there is no future”. The way to the future is Information Technology and the backbone of education in the future is Information Technology.

The change in the Teacher Education Curriculum in 2005 has a tremendously effect in all Teacher Education Institutions. The thrust of the educational system includes the integration of technology in the curriculum with the inclusion of Educational Technology courses such as Educational Technology 1 and 2. But for many, the focus of these courses is typically on technology skills and applications rather than the integration of technology across the curriculum (Smith, 2001). This has been referred to by Pelgrum and Law (2003) as the learning about ICT phase.

Many Teacher Education Institutions (TEIs) have also progressed to the learning with ICT phase, whereby teacher educators are using their computer capabilities to enhance instruction without necessarily changing beliefs about the approach and methods for teaching and learning. The third phase, learning through ICT is not commonly practiced in pre-service teacher education. In this phase, ICT is integrated completely as an essential tool in the curriculum (Pelgrum & Law, 2003)

Moving to this level of integration, where technology infiltrates all aspects of the teacher education curriculum is perceived as out of reach for a large proportion of TEIs. Many of their teacher educators do not have sufficient skills or knowledge to model the use of technology in their classes. Despite funding for the transformation of schools through technology, the classroom was still driven by lectures, textbook, and passive learning (Kromhout & Butzin, 1993.) Opportunity to use technology across a range of both pre-service and in-service classes are further restricted in different schools where a more traditional teacher education and school curriculum is delivered with its focus on lecture style, rote learning and exam based result (Smith, 2001).

Very few teachers are integrating technology into their classes due to the different problems such as availability of resources, training, access and administration support. It is in this premise that the researcher would like to find out the threshold level and the factors that may affect in the TEI's adoption of ICT.

This study seeks to identify the factors that affect the rate of adoption of Information and Communications Technology in the Teacher Education Institutions in Davao City.

Specifically it sought to answer the following specific questions:

(1) What is the demographic profile of the respondents in terms of:

- a. Sex
- b. Age
- c. Length of service in teaching

- d. Number of years using ICT
- e. Number of ICT trainings attended
- f. Subject taught
- g. Educational Background

(2) What is the status of ICT Institutional Factors in terms of:

- h. resources
- i. connectivity
- j. policies
- k. Accessibility to teachers
- l. Accessibility to students
- m. support
- n. training

(3) What is the status of ICT adoption of Teacher Education Institutions in Davao City?

(4) What is the behavior of teachers and the reasons in adopting ICT for instruction using the contingent valuation model?

(5) What are the factors that significantly affect the rate of adoption of ICT?

2. Objectives of the Study

The purpose of this study was to examine and to give a picture of the status of ICT adoption of TEIs in Davao City and to identify the different factors that may affect the rate of adoption.

This study hopes to offer more arguments in the growing body of knowledge concerning ICT in education. Also, this hopes to provide contribution for TEIs strategic ICT plan, and policy implication for school adoption and assessment of ICT with more contextualized application and implementation.

3. Methods Used

A causal research design using contingent valuation method is used in this study. Causal research design attempts to explain the relationship between two variables (if A causes B to occur). Causal Research explores the effect of one thing on another and more specifically, the effect of one variable on another. This research design is used to measure what impact a specific change will have on existing norms which is the status of adoption and allows researcher to predict hypothetical scenarios upon which an institution will base its technology integration plan.

Contingent valuation method (CVM) was used which involves directly asking people in a survey how much they would be willing to pay for specific services or how much compensation they are willing to accept to give up specific goods and services (Pearce & Turner, 1993). This method is referred to as a “stated preference method” because people are asked directly to state their values, rather than infer values. Dichotomous choice was used to elicit the willingness to pay/willingness to accept. The possible range of values for the maximum WTP (or minimum WTP) of individuals was pre-set. This is to gauge the willingness to pay (WTP) of the teachers for ICT. Estimation of WTP typically involves asking prospective respondents whether or not they would be willing to pay at various hypothetical prices.

The sources of data are primarily from the survey questionnaires given to the respondents in order to determine the demographic profile of the respondents such as sex, age, length of service, number of years using

ICT, number of ICT trainings attended, educational background and subjects taught. The institutional factors of the Teacher Education Institutions with the following indicators: resources, connectivity, policies, accessibility of students and teachers, training, and support are also included in the survey questionnaire.

The general attitude and behavior of teachers and the willingness to pay are also gathered through the third part of the questionnaire using a likert scale and the contingent valuation questionnaire respectively. The status of technology adoption is determine through the part four of the survey questionnaire using rubric for ICT mark threshold which is adapted from Becta school.

The respondents were the teachers teaching in the identified teacher Education Institutions in Davao City. These teachers are handing professional, core and major subjects and teaching in a full time basis. There are 147 teachers from 21 TEIs comprising from private universities and state university respectively.

4. Results

For the socio-demographic profile of the respondents, majority of the ICT adopters and non-adopters are female and most of them ages between 31–40 years old. Adopters are teaching already from one to ten years in the Teacher Education Institutions. For the number of years using ICT majority falls between 0–5 years. It was found out that most of the teachers were not able to attend even a single training on ICT and they are usually teaching non-ICT related courses. A higher percentage of adopters are with MA/MS degree.

The second focus of this study is on the institutional factors in which constitute the profile of TEIs with 47.6% are 1:1 ratio of computer to student and for the speed of internet connection 32.7% has a speed of 256 kbps. The institutional factors such as resources turned out to be given emphasis of the TEIs since 90.5% have funds allocation for the maintenance and support of technology. However most of the TEIs don't have a strong or fast internet connection or wireless connection though most of the schools are providing resource center where teachers can use computers and can be connected to internet. Teacher's accessibility is very evident to TEIs as well. Even students have access to computer laboratories especially if there is prior arrangement by teachers.

TEIs are very weak on policy when it comes to ICT, only 15.6% and 25.2% consider ICT test for teacher's regularization and promotion respectively. When it comes to support such as technical and administrative, majority of TEIs were given support such as access to equipment for instructional purposes, the booking of computer laboratories and class schedule to accommodate teachers in the use of it and the provision of technicians who are available if teachers need them. In the case of training, most of the teachers do not receive trainings specifically on advanced course in the use of the internet such as creating website, developing homepage or video conferencing. Most of the teachers in the TEIs of Davao City are not exposed to latest development and trends on ICT.

The third part of this study is about the status of ICT adoption using the questionnaire on identifying the threshold level. Result shows that in all the indicators for ICT adoption the TEIs turned out to have a low capacity which means below the international standard threshold of 2.0. It implies that TEIs in Davao City are still on the process of starting to adopt ICT in education. Although from the survey the focus of adoption is for the teaching and the learning process with the highest mean of 2.8503 compared to other indicators but still it is interpreted as low capacity. The lowest mean result 3.0935 is on resources since the environment for online learning is not very evident in most TEIs.

Teachers exhibit also a positive behavior towards ICT since the resulted mean are 3.77 and 3.78 respectively

focusing on proper use and maintenance of equipment so that the next batch of students may still benefit through their learning experience and process in the classroom. However, most of the teachers are not open to the idea of paying something for the equipment and its maintenance.

Under contingent valuation result it was found out that 92.5% of the teachers are adopters of ICT and only 7.5% are non-adopters. Schools are usually the source of ICT for them comprising 37.4% and 18.4% are using ICT on their own. The number of hours spend for computers every month ranges from 1–420 hours and most of the teachers spend one to fifty (50) hours every month which is 41.5%. Teachers are spending from Php 80.00 to as much as Php 8,000.00 per month for ICT and the highest percentage of 15.6% amounting to Php 1,000.00 which means that most of the teachers are spending at least Php 1,000.00 every month for ICT alone. Thus, 74.8% of the teachers are willing to pay for ICT in the amount of Php 100.00 every month. They have the reasons why they are willing to pay because they believe that it's one way of helping prolong the life span of ICT equipment so in the future there are still many students who can benefit from them. They are in favor of collecting it through salary deduction comprising 74% while others prefer to have it on a voluntary basis.

Out of 147 respondents, 35 or 23.8% of them are not willing to pay due to the reason that they believe it's the sole responsibility of the school to allocate funds for the budget of ICT for teachers use and 28.57% do not want to pay however are willing to do so but they have limited resources. There are also 108 or 73.5% who are willing to volunteer to help in the maintenance of ICT facilities.

The probit analysis resulted to the following significant factors such as years in using ICT which is positively related; educational background exhibits a negative result wherein an increase in the years of educational attainment there will be a decrease in the probability of adoption; and the last significant factor is the accessibility to teachers with a positive sign indicating that if teachers are given access the higher is the possibility of ICT adoption. All estimates are based on the self-assessment survey by Becta School on the international ICT mark threshold set at 2.0.

5. Conclusion

This study focused on the rate of technology adoption of the TEIs in Davao City. The ICT mark threshold of Becta School used by international schools as a self-survey in determining ICT mark whether below or above the threshold was used as a dependent variable. The threshold level is equivalent to 2.0 which means that the result is greater than 2.0 it is below the threshold level and if less than 2.0 it is considered as above the threshold level and represents the rate of adoption of teachers and TEIs as a whole, used throughout the data analysis.

Results indicated that the three factors namely age, number of years in using ICT and accessibility to teachers are the significant factors that affect the rate of adoption of ICT with the estimates of parameters using tobit analysis. The probit analysis method for the factors affecting the rate of ICT adoption resulted to also three significant factors such as years in using ICT which is positively related meaning, the increase in the number of years in using ICT to increase also in the rate of adoption. The educational background with a negative sign connotes that the higher the educational background the decrease in the rate of adoption which implies that most of the teachers who are PhD and EdD degree holders are lagging already in the adoption which is also in consonance with the result of age variable, the older the teacher the lower is the rate of adoption. The third one is the accessibility to teachers, if the TEIs shall provide teachers with facilities and opportunities on the accessibility of technology, the rate of adoption will increase.

The CVM was used also to determine the willingness to pay of the teachers, taken into consideration that the WTP will opt for the adoption of technology. The teacher adopters' valuation of ICT has an average amount of Php 129.85, and this is the amount they are willing to pay every month for the adoption of ICT.

Taken together, these findings suggest the importance of creating support networks for teachers as well as giving opportunities for faculty development through continuous training and access to technology.

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