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CONNECTING ACCEPTABILITY OF VIRTUAL DESK COMPUTERS (VDC) AND PERFORMANCE IN HARDWARE OPERATION

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ABSTRACT

This study examined the level of acceptability towards virtual desk computers (VDC) at CTU – San Francisco Campus during Second Semester, AY 2018-2019 to develop a technology management package. It utilized the descriptive-normative-correlation method with the use of survey questionnaire as the primary means of gathering data. The statistical treatments used were the simple percentage, frequency, average rank, weighted mean and the correlation-coefficient. Out of the 120 populations, 98 respondents were considered as sample in the study. Most of them are female and mostly falls on the age ranges between 17-23 years old. Obviously, they are the millennial or under generation Y. The frequency of use to VDC was rated sometimes and the period of use found out as one hour per day. Discussed in the findings are factors affecting on the use of VDC. There are six evaluation constructs used in the study such as, age and gender, frequency of use, period of use, perceived usefulness, and perceived ease of use, actual use and performance. As found out, the constructs are significantly correlated to the acceptability of VDC. During practical test, the performance level was rated very good. It was discovered that the level of acceptability on the identified evaluation constructs was rated A (acceptable) and certainly could still be improved into Highly acceptable. Some recommendations on how to improve or validate the results of the study were likewise drawn out of the results of the study. That is why this research developed a technology management package recommended for use.

Keywords: Virtual Desk Computers, Technology Management Package, Evaluation Constructs, Level Acceptability, Technology Acceptance Model

INTRODUCTION

Virtualization has become a primary strategy for addressing growing business computing needs (Roberts, 2015). It has provided us with an opportunity to profoundly transform the desktop computers. School-level expectations driving the adoption of information and communication technologies (ICT) in education worldwide include: increased quality of learning through access to more—and more effective learning resources; more student-centered, active and efficient in the school setting.

IT departments want to realize the acceptability and benefits of desktop virtualization-cost savings, ease of management, improved security, and platform independence (Auseklis, 2016). Streamlining the IT infrastructure footprint by hosting numerous desktops on simplified, centrally managed mainstream platforms means less e-waste when equipment eventually comes to the end of its life. Coupled with this is the extended lifespan on thin clients versus traditional PC.

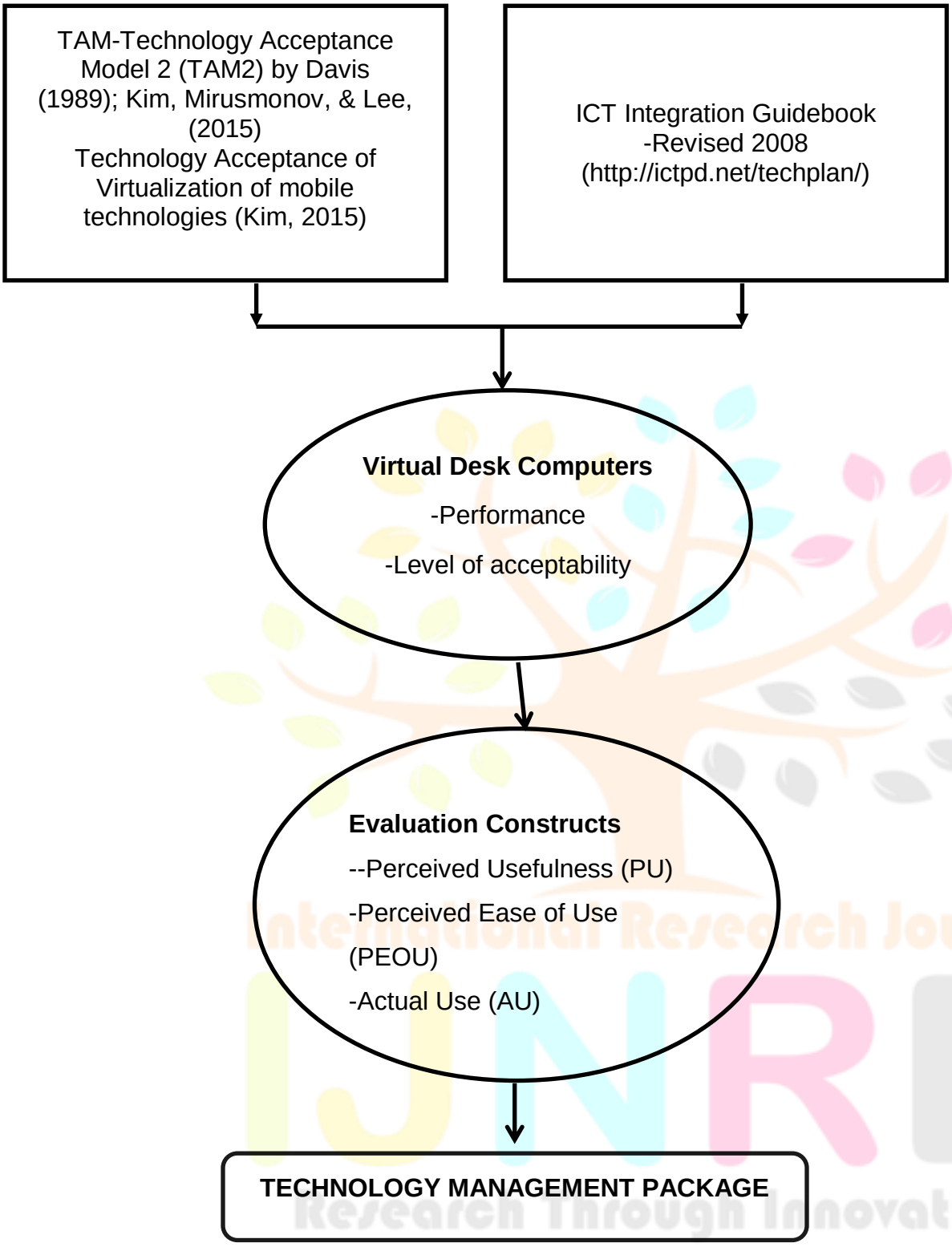
Virtual Desktops essentially offer all the features of a desktop computer, accessible from any machine or device, anywhere. This is accomplished by storing the "virtualized" desktop environment (Kim, 2015) using a data center or remote server and not the individual machine. Users interact with a virtual desktop in the same way they would use a physical desktop in the office. However, virtual desktops let the user remotely log in to access a desktop environment from any location. A virtual desktop infrastructure, or VDI, is desktop virtualization to link multiple virtual machines.

With the aid of this VDC, students may be able to see the difference between actual and virtual manipulation of the computer parts. There may be a doubt on what is really the actual scenario if using the manual way of computers but this will also aid the gap and answer the problem of the shortage of computer and other part of computer in the laboratory.

With the problem arises in a particular computer laboratory that is experiencing one computer to two or three students, traditional PC's typically around 3 years and e-waste pilling up faster than ever around the globe. Energy use and its associated cost has been the key driver for sustainable environment, a growing appreciation (Harmon, et.al., 2015). Thus, sustainability of the desktop virtualization is an important way for organizations and university particularly as it prevent unnecessary toxins such as mercury, lead and cadmium potentially going to landfill.

As people gearing towards with technological globalization, the need arises for enrolling computer courses that would cater the need of any business firm today. Universities are trying to give remedy to it by supplying more computers and other instructional materials for computer technology but it does not answer the problem. Thus, this study is made in order to empower and enhance the competencies of the students in working with virtual desk computers.

This study will help the university to assess the level of acceptability of virtual desk computer in order to make a sustainable program for VDC.



Theoretical and Conceptual Framework

Figure 1

THE PROBLEM

Statement of the Problem

This research evaluated the acceptability of virtual desk computer (VDC) at Cebu Technological University, San Francisco Campus during the second semester, AY 2018-2019 as basis for technology management package.

Specifically, this answered the following:

1. What is the profile of the users as to:
   1.1. age and gender;
   1.2. frequency of use; and
   1.3. period of use?
2. What are the different evaluation constructs on assessing VDC acceptability?
3. What is the level of acceptability based on the identified evaluation constructs?
4. What is the level of performance of users in practical test according to VDC functions?
5. What structural relationship can be determined using SEM analysis of the TAM constructs?
6. Based on the findings, what technology package can be developed?

Statement of Null Hypothesis

The Null Hypothesis is set at 0.05 level of significance.

H1: Perceived usefulness (PU) has significant relationship to respondents' performance to VDC.
H2: Perceived ease of use (PEOU) has significant relationship to respondents' performance to VDC.
H3: Actual use has significant relationship to respondents' performance to VDC.

RESEARCH METHODOLOGY

This section discusses the research design, environment, respondents, instruments, and data gathering procedures, statistical treatment, and scoring procedures.

Design

This study utilizes the descriptive-normative-correlation research to determine the level of acceptability towards virtual desk computers (VDC). In descriptive research, the information needed is clearly defined. It is pre-planned and well-structured and based on large representative samples. Descriptive research support in decision making process by providing the best solution among available and is appropriate approach wherever the objects of any class vary among themselves (Calmorin, 2016). Normative because surveys are frequently made to certain the normal or typical condition or practice, or compare local test results with a state or national norm (Good and Scates, 2015). Correlation because it tests the relationship of the the level of acceptability and performance on VDC.

Flow of the Study

Presented in figure 1 the flow of the study. Inputs are the different external variables that include the respondent's profile and level of acceptability on the VDC program. Data gathered were analyzed and statistically treated in order to arrive at a conclusion and recommendation. A technology management package for VDC will be proposed.

Environment

This study was conducted in Cebu Technological University – San Francisco Campus, San Francisco, Cebu. A satellite campus of CTU System with the main office at R. Palma St., & M.J. Cuenco Avenue, Cebu City, Philippines. The interest of conduct of the study is in the island called camotes located at the Northern part of Cebu between Danao Sea and Ormoc Sea. It is the only University in Camotes Island currently offering courses such as: BEED-CE, BSEd-TLE/MATH, BSIT-CT/ET, BSFi and BSHM.

The most numbered course in the campus is Bachelor of Science in Industrial Technology major in Computer Technology (BSIT-CT) which is currently changed into BIT-CT (Bachelor in Industrial Technology) major in Computer Technology. The course curriculum offered various computer related subjects to the students since first year up to its fourth year. Every semester the BSIT/BIT-CT student can hands-on computer in the designated computer laboratory. As of this moment, the problem is still unsolved because of its limited resources in terms of computer resources availability. But the management is trying its best to cope with the gap and hopefully this study will help the problem be solved.

Respondents

The respondent of this study were the faculty members, Staff, and the BSIT/BIT-CT students handling computers. They were selected because of the potential and capacity of manipulating computer resources particularly on VDC. They were identified using the purposive random sampling, also referred to as a judgmental or expert sampling, is a type of nonprobability sample. The main objective of a purposive sample is to produce a sample that can be logically assumed to be representative of the population. This is often accomplished by applying expert knowledge of the population to select in a nonrandom manner a sample of elements that represents a cross-section of the population, Lavrakas (2016).

Out of the 290 populations, eighty-nine and sixty-five percent (89.65%) of the entire population was considered as sample respondents because purposive random sampling focuses on the greater number of samples in order to get the nearest accuracy of the gathered data.

Instrument

The researcher used interview methods and researcher-made questionnaire, and some are adapted from the study of Kim, 2015 on virtualization acceptance as the technique in collecting and gathering data about the level of acceptability towards VDC.

To assist the gathering of the demographic profile of the respondents, a researcher-made instrument or checklist was utilized.

Another is the assessment of the respondents' perception and level of acceptability toward VDC that utilizes researcher-made and some adapted questionnaires based from the two (3) determinants of TAM model which are: perceived ease of use (PEOU), perceived usefulness (PU) and actual use (AU). Each determinant has its item with consideration of the definition of each determinant.

Data Gathering Procedure

This was followed after gathering all the necessary permissions and endorsement through transmittal letters. The research instrument was finalized under the guidance of the dissertation adviser. Proper coordination with the Campus Director and the Instructor/Professors was made to ensure one hundred percent (100%) retrieval of fielded questionnaires. The gathered data will be tabulated, subjected to statistical treatment, analyzed, and interpreted very well.

Treatment of Data

The following statistical techniques were used in this study:

1. *Simple Percentage*: This was used to treat the demographic profile of the respondents.
2. *Frequency/Frequency Distribution:* This was used to see the frequency of perception toward users' VDC perception and level of acceptability.
3. *Average Weighted Mean using Likert-Type/Five-Point Scale*: This was used to analyze the users' VDC perception and level of acceptability.
4. *Average Rank*: This was used to analyze and interpret the average of the perception of the users' and level of acceptability towards VDC.
5. *Correlation Method*: This was used to test the relationship of the performance and level of acceptability towards VDC

PRESENTATION, DATA ANALYSIS AND INTERPRETATION

This chapter covers the presentation, analysis and interpretation of data obtained from the respondents of Cebu Technological University- San Francisco Campus, San Francisco, Cebu who experienced using VDC system. The data presented are the following: the profile of the respondents as to,

age and gender, VDC frequency of use, and VDC period of use; level of acceptability towards VDC system; and the significant relationship of the VDC constructs and level of acceptability towards VDC system.

PROFILE OF THE RESPONDENTS

Age and Gender

Out of 260 respondents, there are 2 or 0.77 percent male respondents falls within the age bracket of 35 plus, while 10 or 3.85 percent male respondents were between 29-34 years old, 29 or 11.15 percent male respondent were between 24-28 and 47 or 18.08 percent male respondent belonged to the age bracket of 17-23 years old. On the other side, there are 5 or 1.92 percent female respondents falls within the age bracket of 35 plus, while 15 or 5.78 percent female respondents were between 29-34 years old, 44 or 16.92 percent female respondents were between 24-28 years old and 108 or 41.54 percent female respondent belonged to the age bracket of 17-23 years old.

It denotes that the majority of the respondents considered as youth or under generation Y. The age distribution of the above mentioned is expected to fall on the age bracket of 17-23 years old as the normal college student age is concern. According to Shih (2016), virtualization on the digital age results to the quality of gaining the entire information system of today's generation very visible. Where various studies have noted that the quality of information used in virtualization is the measuring of systems. The quality of the information acquired on virtualization includes an assessment of the effects of the web usage. The virtualization information quality is used commonly by the digital age in browsing into internet where many information could be acquired that relates more to virtualization. It is assumed that the perceived service quality on virtualization affects the use on it according to what the generations have perceived about it.

Frequency of Use

The *Webopaedia* [(2016); an online dictionary], defines frequency of use as the systematical and habitual response to a particular ICT device. Virtualization as found out to be an ICT, the frequency of the response in it will be determined below. Table 3 presents the VDC frequency of use.

There are 167 or 64 percent rated VDC use as sometimes. While there are 82 or 32 percent were falling in the VDC frequency of use as often. And 11 or 4 percent use VDC always. Maybe there is a misconception between sometimes and often but there is a big difference of the two. It falls into a frequency of sometimes if the user is using VDC one hour per day, seven hours a week or twenty-eight hours a month. On the other hand, it will be often if the user is using VDC three hours per day, twenty hours a week or eighty-four hours a month.

Noticeably, the VDC frequency of use falls into sometimes because the users or respondents are students. VDC are only available in the school particularly in the computer laboratory and they can only have their hands-on during laboratory hours or during major time. Some are using VDC often because it of the availability of the VDC in the computer laboratory. The issue of the one is to two or three computers really matters. The VDC is only installed to a computer and that a student will wait until the other student can finish using it. In short, time constraint is the concern for others particularly those who says often. Only few amongst the user are using it always because there are those who have installed VDC in their laptop for practice. Lastly, the willingness to learn and explore VDC really matters.

Period of Use

According to the Merriam-Webster Dictionary (2019), period of use refers to the length of time during which a series of events or an action takes place or is completed. VDC period of use could mean the length of time users spent to VDC. VDC period of use is presented in table 4.

There are 153 or 59 percent were falling on one hour per day, while 69 or 27 percent were falling on three hours per day, 27 or 10 percent were falling on seven hours a week, 9 or 3 percent were falling on six hours per day and 2 or 1 percent were falling on twenty-eight hours a month. Mostly users are using VDC one hour per day because they only have one hour to use it during major time. Those who are using VDC three hours per day are those students who extended their effort to use VDC like using it during break time, i.e, lunch break or class break. However, those who use VDC seven hours a week is just similar to the first

one. Lastly, only two amongst the users says they use VDC twenty-eight hours a month as they belong to the students who seldom use VDC. The availability of VDC is the main factor of the length of time usage by the users towards VDC.

In this study, it was found out that VDC is sometimes used by the user and somehow often. Hence, its level of acceptability may also continue to develop as they unceasingly use it.

VDC EVALUATION CONSTRUCTS

The research model was built based on TAM while introducing various modifications on the original model which yields directly to the creation of TAM2. User frequency of use is conceptualized as the affective reactions of individuals toward the use of virtualization and computer applications in general (King, 2015). Several variables such as perceived usefulness, perceived ease of use and actual use recommended these as the enough predictor to identify the performance of the users to a system. This suggests that these predictors are to be placed as specifications to measure the level of acceptability towards VDC.

Research Model

The theory of reasoned action (TRA) is a model widely studied from the different social studies which is concerned with the determinants of consciously intended behaviors (Kim, 2015). The foundation of its conceptual framework is to provide distinction between attitudes, intentions, beliefs and behaviors. According to TRA, a person's performance of a specified behavior is determined by his or her behavioral intention (BI) to perform the behavior, and BI is jointly determined by the person's attitude (A) and subjective norms (SN) concerning the behavior in question.

The Technology Acceptance Model (TAM) was first introduced by Davis (1986). It is an adaptation of TRA particularly tailored for demonstrating user acceptance of information technology. TAM aims to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations (Davis et al. 1989, p.985).

A key purpose of TAM is therefore to provide a basis for knowing the impact of external factors on internal beliefs, attitudes, and intentions. TAM2 was formulated in an attempt to achieve these goals by identifying a small number of fundamental variables suggested by previous research dealing with cognitive and affective determinants of computer acceptance.

Perceived Usefulness (PU)

Admittance to information offers the opportunity for improved human competence. Lombardi (2017) observed that the acquirement of capacity to access genuine information is prevented by users' reluctance to accept and use available strategies and techniques to access the information. Perceived usefulness, according to Davis (1989: Kim, 2014), is the extent to which a person believes that utilizing a particular method or technique would enhance his or her job performance or routine responsibility. This perception, he explains, is anchored on the consideration that the capacity acquired will strengthen performance.

Furthermore, he believes that people are naturally reinforced for better performance by raises, promotions, bonuses, and other rewards. The TAM2 undoubtedly presents value to many researchers because it has effectively demonstrated how such value can improve users' job performance. Perceived Usefulness and perceived ease of use has proven to be a very important factor for technology adoption in most recent studies (Teng 2015).

Perceived Ease of Use (PEOU)

Davis and Kim (2015) argued that perceived ease of use is the extent to which an individual considers that making use of a specific system would be effortless and hassle free; in other words, ease of use means freedom from complexity and trouble. Thus, an application that is perceived to be easier to use is generally accepted and utilized by more people. Zhu and Hsu (2015) add that perceived ease of use signifies the degree to which an individual accepts that using certain technology would be effortless and hassle free. The characteristics of the system can help the ease of use of technology and system usage can equally

lead to the acquisition of Information Technology knowledge. Nanthida (2015) enumerates certain factors that may influence the ease of use of modern resources such as characteristics of information resources, the ICT experience, technical equipment and support, etc.

Actual Use (AU)

In the opinion of Walker (2015), actual use and apply new skills is the willingness or extent to which an individual is consciously prepared to execute a particular action. Actual use is a dependent variable that predicts the performance level of a particular skill that will ultimately lead to attitude formation. One of the opinions that are constant among various models is that learners' behavioural intention to use a technology or embrace a skill that leads to the actual usage of the skill and expertise (Ajzen 2015) is important. Thus, users' participation, interaction with others and attitudinal change create a fertile ground for actual use a new technology.

Another is the contributor that may affect the actual usage of technology is the computer experience. This is a motivating factor that could lead to the actual use, therefore, computer literacy refers to the comfort level attained in using computer programs and other applications that are associated with computers. Therefore, a helpful component of computer literacy involves the knowledge of how computers work and function (Liao, 2018) and it can also determine the actual of a technology.

LEVEL OF ACCEPTABILITY TOWARDS VDC

This section presents the level of acceptability towards VDC with the aid of technology acceptance model (TAM) by Davis which he originally formulated this theory in 1989 and later adopted and modified by some researcher particularly by Kim et.al in 2014. The TAM variables use to determine the levels of acceptability towards VDC are: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Actual Use (AU) as the theory and research model in the study. On the other hand, level of acceptability towards VDC could mean as the degree of user's acceptance towards VDC. According to Alsamydai et al., (2016); virtualization experience generally influences a digital's usage, the degree to which a virtual computer experience affects a user's varies and it is a subject in which the particular technical support being examined. The use of virtual computers depends on the technical support itself and the experience level of the individuals using it. Virtual computer services will contribute positively to the perceived usefulness. According to Kwon (2015), virtual computer experience has been found to be associated with perceived usefulness. In the study of Chung (2016), the experience has an effect on the user's intentions and usage of virtual computer.

PERFORMANCE OF USERS ON VDC

Present in this section the performance of the users on VDC. Knowing the performances of the users on VDC, the acceptability level will be determined. According to Lincoln (2015), performance has been found to be associated with perceived usefulness, perceived ease of use and actual use. In the study of Chung (2016), the experience has an effect on the user's intentions and usage of virtual computers. According to Nunkoo et al., (2015) many researchers (Moon, 2015) have studied the relationship between perceived ease of use, perceived usefulness and actual use of the system. Perceived ease of use can also contribute in an instrumental way in improving user's performance on virtualization. Due to the fact that the user will have to deploy less effort with a tool which is easy to use against the manual way, they will be able to spare efforts to accomplish other tasks and yield a good performance (Kim, 2015).

RELATIONSHIP BETWEEN THE PERFORMANCE AND LEVEL OF ACCEPTABILITY TOWARDSVDC

The level of acceptability towards VDC as seen in previous presentations is high. It is necessary to know its relationship to the level of performance so that the users will be guided and become more

determined in accessing VDC. Not only the users but it is a target to influence other students and members in the institution to use VDC.

Table 11 presents the relationship between the level of acceptability and level of performance.

The performance on VDC and the level of acceptability towards VDC is significantly correlated. As mentioned earlier, many studies have supported it, particularly the study of Kim (2015) that the evaluation constructs affect the level of acceptability towards VDC and the level of acceptability affects the performance of the user on VDC.

Between the performance and level of acceptability, the computed r of 0.04801 is numerically lower than the critical p value of 0.96574 which is almost equal to zero. This was supported by the study of Brownlee, 2018 that if the correlation ranges from -1.0 to +1.0. The closer r is to +1 or -1, the more closely the variables are related.

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

This Chapter presents the summary, findings, conclusions and recommendations based on the gathered data and other significant information from the research.

SUMMARY

This study assesses the acceptability of virtual desk computers (VDC) at Cebu Technological University, San Francisco Campus during the second semester, AY 2018-2019 towards technology management package. Specifically, it analyzed the profile of the respondents in terms of age and gender, frequency of use and period of use. It also investigated the users' perceived usefulness, perceived ease of use, actual use and performance on VDC. The variables were identified to found out significant relationship on the performance and the level of acceptability on VDC.

This study utilized the descriptive-normative-correlation method. The null hypotheses state that there is significant relationship on evaluation constructs and level of acceptability towards VDC. In summary, this study provides theoretical contributions by proving the extended TAM model which is now the TAM2 with the perspective of measuring the virtualization acceptability.

FINDINGS

Based on the data gathered, presented and analyzed hereunder are the findings of the study.

On the age and gender profile of the respondents, it was found out that most of them are female with the age range between 17-23 year old. Mostly, they use VDC sometimes within the period of one hour per day.

On the evaluation constructs, it was found out that each construct are correlated with each other and necessary to combine to assess the level of acceptability towards VDC. The evaluation constructs used in this study are: age and gender, frequency of use, period of use, perceived usefulness, perceived ease of use, actual use and the performance on VDC.

On the level of acceptability towards VDC, the respondents rated A (acceptable) on the perceived usefulness, rated A (acceptable) on the perceived ease of use, and likewise rated A (acceptable) on the actual use. The overall assessment on the level of acceptability toward VDC is A (acceptable).

It was found out that there is significant relationship between the performance and the level of acceptability towards VDC and its construct.

CONCLUSION

Results of the study led to the users to extend their dedication to use VDC continually and heartily accept it with open arms. After all this could be their stepping stone to fully adopt technology trend in this generation brings.

Furthermore, it has been revealed that actual use of technology will be strongly incorporated the variable in assessing the level of acceptability to ICT.

Therefore, VDC is acceptable. Acceptability is related to performance and other evaluation constructs.

RECOMMENDATIONS

In the light of the conclusion presented, the propose virtual desk computers (VDC) with its user's manual and module must be adopted and highly recommended for use for computer hardware instruction.

Below are recommended for remedial actions in addressing possible weakness of the study:

1. The proposed VDC manual and module must be enhanced further to maximize the use of VDC.
2. The administrators should introduce and include the VDC user's manual and module in the BSIT curriculum.
3. The skills acquired in VDC should be the stepping stone on attaining high level performance on VDC.
4. Students must have a strong dedication in using this new technology (VDC).
5. All subjects must be integrated with Information and Technology.
6. The school must have the ability to organize and practice the existing mobile technologies today.
7. Future researchers are stimulated to conduct similar research in relation to this study to cope the needs of the digital user.

REFERENCES

Addo, H. (2014). Using UTAUT model to analyse students' ICT adoption. International Journal of Education and Development using Information and Communication Technology (IJEDICT), vol. 10, Issue 3, pp. 75-86, 2014.

Al-Gahtani, S.S. & King, Malcolm. (2015). Attitudes, Satisfaction and usage: Factors Contributing to each in the acceptance of information technology, 18:4, 277-297, DOI: 10.1080/014492999119020.

Chew, K-W, Shingi, P.M. M.I. (2016). IFIP International Federation for Information Processing , Volume 226, 2016.

Davis, WQ. (2016). A technology acceptance model for testing new end-user information systems: Theory and results.

Davis, WQ. (2016). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 113 (13).

Doolin, B.L (2016). Evaluating the use of virtualization in the global market. A case study from England, Industrial Management, 23(5).557-661.

Fishbein, N., & Ajzen, J. (2015). Belief, Attitude, Intention and Behaviour. An introduction to theory and research. MS: Reading

Hubona, G.S. and Geitz, Sarah (2015). External Variables, Beliefs, Attitudes and Information Technology Usage Behavior, Computer Society International Conference, 2015.

Kim, S. (2015). Acceptance on Mobile Technologies: Technology Acceptance Model Predictor Construct, International Journal on Science and Technology, Vol.3, 2016.

Kim, S.; Hsu, C.I (2014). Acceptance and roles of information technology: Technology Acceptance Model 2. (Unpublished dissertation).

Kim, C. (2015). An empirical examination of factors influencing the acceptance of virtual closets. International Jounal on Computers in human behaviour.

Lai, PC. (2017). The Literature Review of Technology Adoption Models and Theories for the Novelty Technology, JISTEM (Journal of Information Systems and Technology Management), Vol.14, No.1, Jan/Apr., 2017 pp. 21-38.