

Acceptability of Unified ICT-based Assessment System for IT Subjects among BS Computer Science Students at Capiz State University Pontevedra Campus

Virginia G. Figueroa, and Shawn A. Dacles

Computer Education Department, College of Education, Arts and Sciences
Capiz State University–Pontevedra Campus
Pontevedra, Capiz, Philippines

Abstract

This study was conducted from June 2017 to June 2018 in Capiz State University – Pontevedra Capiz. It aimed to develop, design, and determine the acceptability level of the Unified ICT-based Assessment System for IT Subjects at the Campus by the targeted users when grouped as a whole. The Iterative Model of System Development Life Cycle was used in developing and designing the system and descriptive design in gathering information for its acceptability to 89 BS Computer Science students using purposive sampling. An adapted instrument was used to gather the necessary data in this study. The criteria are as follows: a) appearance, feature, and visual quality; b) user interface, simplicity, and intuitiveness; c) ease of use and learning curve; d) user guidance; and e) assessment of software usability and satisfaction. The acceptability of the software in terms of appearance; user interface; ease of use; user guidance; and usability obtained the grand mean of 4.33, 4.24, 4.34, 4.19 and 4.43 respectively while the overall acceptability of the system was 4.31. The results indicate that the software was acceptable among the respondents using the range of 1.0 to 5.0, with 5.0 as highly accepted. This indicates that they are interested in using the software as part of their everyday activities in school.

Keywords: Assessment, ICT-based, Information Technology, test bank, Unified

Corresponding author: Virginia G. Figueroa

Address: Capiz State University - Pontevedra Campus, Pontevedra, Capiz, Philippines

E-mail: vgfigueroa@capsu.edu.ph

ISSN 1908-2843 Print

Introduction

Teaching is considered to be a noble job. This profession does not simply consider the usual duty as an employee but a duty with moral responsibility. Tasked not only as a classroom teacher but also designated an individual assignment to comply with the requirements of the institution, wherein he/she is serving. Considering the type of learners, teaching styles and methods should also be considered in preparing the students for the future. Being a teacher, workloads inside the classroom are most of the time, being brought even at home which is one of the reasons why some of the teachers do not have time left for himself, and worse, for the family.

One of the main functions of this profession is to measure the learning of the students. Different assessment methods such as examinations may be used, may it be written, oral, or a practical one. Test construction is not an easy job since the teacher spends much time in preparing it, and it takes mostly a day for just a single subject.

Known for simplifying various tasks in our daily lives, technology is a great help in the teaching profession. With the advent of technology, and integrating this in this profession, a mentor's life can be a lot easier. Moreover, since we are now in the digital age, technology in the classrooms is a common thing. From lecture preparations, delivery or lecture presentations, and computation of grades, technology is running. In test preparations, computers are also being used. But if not automated, it will still be time consuming before a teacher could finish constructing an examination for just a subject.

This study aimed to design and develop a Unified ICT-Based Assessment System for IT Subjects at Capiz State University at Pontevedra Campus and determine its acceptability among the BS Computer Science students. The result of this study can be a comprehensive solution for creating, administering, and scoring tests. The software includes many features to save time and generate information to assess and improve student performance. It allows for the quick production of examination and assessment result. Using this software, a user can enter their questions and can automatically generate scores.

Materials and Methods

Software Design Model

System Development Life Cycle (SDLC) Model – The Iterative Model

SDLC is the acronym for Software Development Life Cycle or System Development Life Cycle. In simple words, it is the process or method applied to create or alter software projects. SDLC consists of several distinct phases that are followed by methodically (Oz, 2002). Each of these methodologies defines a unique way to create a new software module or program.

The SDLC of this study utilizes the iterative method due to its flexibility and efficiency with the proposed system. The flexibility of this method allows the researcher to make adjustments in accordance with the demands of the client in the middle of developing the system without creating disarray in the flow of the development. This method is efficient in producing a detailed observation and results in every stage of the development due to its monitoring stage. This method also allows the researcher to save time and efforts by detecting problems that need verification early in the stage and be able to modify it in the previous stages (Shelly, 2003).

Theoretical Framework



Figure 1. ICT-Based Assessment System for IT Subjects at Capiz State University-Pontevedra Campus

This study used the input–process–output (IPO) model, or input-process-output pattern. This model, as shown in Figure 3, was used in many introductory programming and systems analysis texts which introduce this as the most basic structure for describing a process (Goel, 2010).

Flowchart

A system flow chart symbolically shows how data flow throughout a system and how event-controlling decisions are made (Farell, 2011). The flowchart in Figure 2 shows the flow of transactions used in the design and development of this system. Research Design (Acceptability of the System).

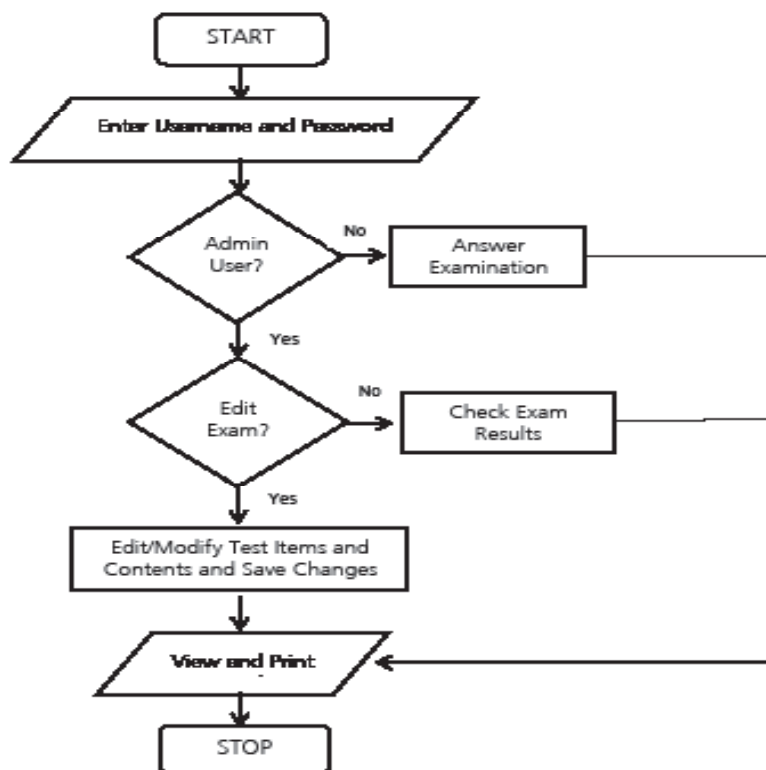
Descriptive statistics are numbers that are used to summarize and describe data (Hebl, 2018). Descriptive research provides a clearer picture of the present condition of the respondent's acceptability of the developed software. The perception and assessments of the respondents generated in the study were qualified using means.

Sample Size and Sampling Techniques

There were 89 respondents conveniently sampled in the study with the BS Computer Science students of Capiz State University-Pontevedra, Campus. The respondents of the study were chosen using purposive sampling. It was utilized in order to effectively measure the acceptability of the developed system since the respondents have knowledge about the procedures where the developed system was designed for.

Respondents of the Study

The BS Computer Science students of Capiz State University-Pontevedra, Capiz were the respondents of the study. There were 89 respondents who were asked to use the system and rate the level of acceptability of the Unified ICT-Based Assessment System for IT Subjects at Capiz State University – Pontevedra Campus.



Capiz State University-Pontevedra Campus

Research Instrument

The study used an adapted instrument from Villanueva (2014) in the study entitled: "Design and acceptability of Chemisics and Educational Quiz Game for K-12 Students." This will be answered by the users/respondents as to the acceptability of the system in terms of a) appearance, feature, layout, and visual quality; b) user interface simplicity and intuitiveness; c) ease of use and learning curve; d) user guidance; (e) assessment of application usability and satisfaction.

The data were analyzed using: 1) frequency counts, mean, percentage, and total score point; and 2) weighted mean counts to test the level of acceptability on

the software by the respondents.

Data Gathering Procedures

The survey questionnaires were distributed among the respondents, along with a presentation of the system. After the presentation, the respondents were asked to use the developed system and were given ample time to explore it. After using the system, the respondents were asked to fill each item on the questionnaire on how acceptable the developed system was. The data were gathered for tabulation and were prepared for analysis. A tally sheet was provided where the responses of the respondents were recorded, and to avoid repetition of encoding the responses, the questionnaires were consecutively numbered. The gathered data were tabulated and prepared for analysis by the university statistician.

Scoring of Responses

The development and acceptability of the study were expressed from the Department of Education in terms of weighted means which were interpreted as follows:

Range of Score	Verbal Interpretation	Description
4.5 - 5.0	Highly Accepted	Respondent agrees to all the features of the system.
3.5 – 4.49	Accepted	Respondent agrees to about 80% of the system's features.
2.5 – 3.49	Moderately Accepted	Respondent is satisfied with the features it offers.
1.5 – 2.49	Slightly Accepted	Respondent is slightly beginning to dislike some of its features.
1.0 – 1.49	Unaccepted	Respondent does not accept all the features of the system

Data Analysis Procedures

Responses to each aspect of the questionnaire were gathered, and results were tallied in a datasheet then tabulated and categorized for mathematical and statistical analysis using the following statistical tool:

Mean. The statistical tool that measures central tendency as the sum of all scores divided by the number of cases (Lane, 2018). In this study, it is used to calculate

the average central tendencies of any group of responses

Results and Discussion

System Functions

The following features are available in the Unified ICT-based Assessment System for IT Subjects at Capiz State University – Pontevedra Campus: a) System Authentication that allows the user to be recognized by the system. This assures the administrator the authenticity of the exam takers. A username will then be assigned for each user and be provided with own password; b) Assessment Classification that allows the user to select the number of items and the type of examination preferred by the course facilitator; c) Performance Evaluation that uses an algorithm by randomly selecting questions for the students to perform. The users must answer each item based on the given questions. This also covers the automatic computations of scores obtained by the students; d) Records Management that includes a database that will serve as the databank to store the test questions answer keys, and examination results. This function handles the encoding of information needed for the examination data file. Entries on this module will be used as a reference for generating test items during the examination. Encoded data can also be updated and viewed, and e) Report Generation that allows the user to review and generate reports and test results.

Acceptability of Unified ICT-based Assessment System for IT Subjects among BS Computer Science Students at Capiz State University – Pontevedra Campus

Table 1. The acceptability in terms of appearance, feature, layout, and visual quality of ICT-Based Assessment System for IT Subjects at Capiz State University – Pontevedra Campus.

Appearance, Feature, Layout and Visual Quality	Mean	Verbal Interpretation
1. The appearance of the system tells you how to use it.	4.44	Accepted
2. The viewer's attention and focus go to with the examination itself	4.26	Accepted
3. The system works the way it is supposed to work.	4.37	Accepted
4. The labels are appropriate and clear.	4.35	Accepted
5. The color contrasts are good.	4.21	Accepted
Grand Mean	4.33	Accepted

The items for Appearance, Feature, Layout, and Visual Quality obtained a grand mean of 4.33, which is verbally interpreted as “Accepted.” This implies that the respondents agreed to the appearance, feature, layout, and visual quality of the Unified ICT-based Assessment System for IT Subjects.

Table 2. The acceptability in terms of the user interface, simplicity and intuitiveness of ICT-Based Assessment System for IT Subjects at Capiz State University – Pontevedra Campus.

User Interface Simplicity and Intuitiveness	Mean	Verbal Interpretation
1. The system interface is structured logically.	4.19	Accepted
2. Necessary prompts are available for inputs.	4.19	Accepted
3. The system informs about its progress.	4.39	Accepted
4. Error messages are available.	3.98	Accepted
5. The system is designed for all levels of users.	4.45	Accepted
Grand Mean	4.24	Accepted

In terms of the user interface, simplicity, and intuitiveness, the respondents rated the ICT-based Assessment System for IT Subjects as “accepted”, with a mean of 4.24, which implied that the respondents agreed to the user interface, simplicity, and intuitiveness of the developed system. This means that it provides the user with an articulated graphical output and appearance on the computer monitor.

Table 3. The acceptability in terms of ease of use and learning curve of ICT-Based Assessment System for IT Subjects at Capiz State University – Pontevedra Campus.

Ease Of Use And Learning Curve	Mean	Verbal Interpretation
1. The system is easy to access /ease of use/ user-friendly.	4.47	Accepted
2. It takes a while to get the first results from the system.	4.36	Accepted
3. The system can be used easily, and it does not take a lot of time.	4.30	Accepted
4. I find the system flexible to interact with.	4.22	Accepted
5. I find it easy to get the system to do what I want it to do.	4.35	Accepted
Grand Mean	4.34	Accepted

For the ease of use and learning curve, which is the user-friendliness and ease of usage of the software, a grand mean of 4.34 was obtained with the verbal interpretation of “accepted”. This means that the user can easily use the ICT-based Assessment System for IT Subjects and is considered to be user-friendly.

Table 4. The acceptability in terms of user guidance of ICT-Based Assessment System for IT Subjects at CAPSU – Pontevedra Campus.

User Guidance	Mean	Verbal Interpretation
1. The system provides CANCEL option	3.98	Accepted
2. The error messages displayed are helpful.	4.18	Accepted
3. HELP option is provided.	4.16	Accepted
4. The completion of processing is indicated.	4.25	Accepted
5. A comprehensive user’s manual is provided to assist users with the technicalities of the system	4.36	Accepted
Grand Mean	4.19	Accepted

The items for user guidance obtained a grand mean of 4.19 which is verbally interpreted as “accepted”. This implies that the respondents are satisfied with the user guidance through the instructions in Help Options provided by ICT-based Assessment System for IT Subjects.

Table 5. The acceptability in terms of assessment of application usability and satisfaction of ICT-Based Assessment System for IT Subjects at CAPSU – Pontevedra Campus.

Assessment of Software Usability and Satisfaction	Mean	Verbal Interpretation
1. The software satisfies the needs of end-users in terms of user experience.	4.46	Accepted
2. The software is efficient and effective to use (that is, the examination saves time for the teachers to evaluate the students).	4.49	Accepted
3. Using a computer in preparing and declaring results minimizes clerical mistakes.	4.42	Accepted
4. The results of the Unified ICT-based Assessment System for IT Subjects are reliable.	4.42	Accepted
5. I am satisfied with the model.	4.38	Accepted
Grand Mean	4.43	Accepted

In the assessment of application, usability, and satisfaction, a grand mean of 4.43 was obtained with a verbal interpretation of “accepted”. This means that the respondents are in agreement that the ICT-based Assessment System for IT Subjects is applicable, usable and satisfactory.

Table 6. The overall acceptability of the Unified ICT-based Assessment System for IT Subjects at Capiz State University – Pontevedra Campus.

Acceptability Of Unified Ict-Based Assessment System For It Subjects	Mean	Verbal Interpretation
A. Appearance, Feature and Visual Quality	4.33	Accepted
B. User Interface, Simplicity, and Intuitiveness	4.24	Accepted
C. Ease of Use in Learning Curve	4.34	Accepted
D. Documentation and Supplementary Materials	4.19	Accepted
E. Assessment of Software Usability and Satisfaction	4.43	Accepted
Grand Mean	4.31	Accepted

The overall results of the acceptability of the ICT-based Assessment System for IT Subject classified by the type of query that was asked is evident from the survey results that all respondents agreed that the ICT-based Assessment System for IT Subjects was “accepted” by the users, with a grand mean of 4.31. This indicates that the respondents are interested in using the software as part of their everyday activities in school.

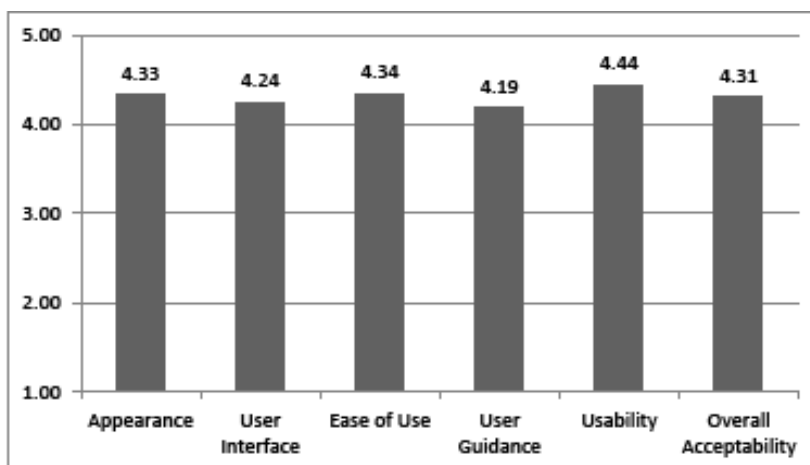


Figure 4. The acceptability result of the ICT-based Assessment System for IT Subjects among BS Computer Science Students at Capiz State University - Pontevedra

Conclusions and Recommendations

The Unified ICT-based Assessment System for IT Subjects at Capiz State University – Pontevedra Campus was designed, developed, and tested for acceptability. The system has the following features: System Authentication, Assessment Classification, Performance Evaluation, Records Management, and Report Generation. The results of the acceptability tested in the software indicated that the software was acceptable among the respondents using the range of 1.0 to 5.0, with 5.0 as highly accepted. Receiving the highest grand mean, the assessment of the application, usability, and satisfaction criterion indicates that the respondents are interested and believe in its usefulness in their everyday activities in school. This only proves that we are now in the 21st-century learning where Information, Media, and Technology Skills are parts of the knowledge and expertise students should master to succeed in work and life in the 21st-century (Partnership for 21st Century Learning, 2015).

Today, we live in a technologically motivated environment with access to a great amount of information, fast changes in technology tools, and the ability to work together and make individual contributions on an exceptional scale. To prepare our students to be effective in the 21st-century, we must teach them to create, evaluate, and effectively utilize information, media, and technology.

Based on the conclusions of this study, it was recommended that training on this software might be conducted to help the interested faculty members save time in preparing different documents such as quizzes, major examinations, and keeping of databases of their teaching materials. Improvement on the features of the software may be developed in the future to enhance its features such as automatic construction of Table of Specifications, and calculations on Item Analysis to suit the particular needs of the faculty members in terms of exam preparations.

Acknowledgments

The researchers would like to convey their appreciation, in thanking the people who shared their knowledge in their fields of expertise during the conduct of the study and their help in making this research possible:

To the Capiz State University – Pontevedra Campus family, for giving them the opportunity to conduct this study; and

To Dr. Leo Andrew Biclar and Dr. Louis Placido F. Lachica, for the assessment and suggestions for the betterment of this study.

References

- Farell J., (2011), Programming Logic Formulation, 6th Edition, Cengage Learning Asia Pte. Ltd., Pasig City, Philippines.
- Goel, A. (2010). Computer Fundamentals, Pearson Education India.
- Hebl, M. (2018). Introduction to Statistics, Online Edition, Retrieved on August 20, 2017, from http://onlinestatbook.com/Online_Statistics_Education.pdf
- Kendall, K. E., and Kendall J. E. (2011). Systems Analysis and Design, Eighth Edition, Pearson Education South Asia Pte Ltd., 23-25 First Lok Yang Road, Jurong Singapore 62733, p.31.
- Lane, D. M. (2018). Introduction to Statistics, Online Edition, Retrieved on August 20, 2017, from http://onlinestatbook.com/Online_Statistics_Education.pdf
- Oz, M. (2002). Management Information System Fifth Edition, Pearson Education South Asia Pte Ltd., 23-25 First Lok Yang Road, Jurong, Singapore 62733, p.25.
- Partnership for 21st Century Learning, (2015). Framework for 21st Century Learning. Retrieved on August 21, 2017, from <http://www.p21.org/our-work/p21-framework>
- Shelly, G. B., Cashman, T. J, & Rosenblatt, H. J. (2003). Systems Analysis and Design, Seventh Edition, Thomson Learning Asia, 5 Shenton Way #01-01 UIC Building Singapore 068808, p.368.
- The Systems Development Life Cycle (SDLC). Retrieved December on 29, 2016, from W3 Computing website, <http://www.w3computing.com/systemsanalysis/systems-development-life-cycle/>
- Villanueva, C. (2014). Design and Acceptability of Chemisics and Educational Quiz Game for K-12 Students. The Technocrats Research Journal, Vol. 9, No. 1, page 14-24