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COMPUTER GAME-BASED LEARNING TOOL FOR TECH-VOC ICT SENIOR HIGH SCHOOL STUDENTS IN A STATE UNIVERSITY

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ABSTRACT

Computer games are tremendously accepted medium across all age and have considerably impacted on the means that millennial people spend their free time. Educationalists are optimistic that they will be able to utilize the encouraging attributes of computer games for learning purposes. The University is offering senior high school computer related strand like Tech-Voc ICT. This track have subject Introduction to Computing. Teaching this subject requires thorough discussion for the better understanding of the student. This paper will present the findings of the use of computer game-based learning. This paper will also report the results of experimental work performed over a semester period to Introduction to Computing subject using a computer game- based application. The results show that a sense of success was evident. Thus, the proposed Computer Game-based learning is effective as a Self-Paced Learning, and Interactive Learning.

KEYWORDS: *Evaluation, technology acceptance, Game-based learning.*

INTRODUCTION

The fame of games in classic society has spurred many to question how games might be used to attach young people inside the classroom. Student right to use to technology is no longer an opportunity it is a prerequisite for complete participation in high-quality education opportunities. Undoubtedly, students without access to technology-based environments will be greatly disadvantage in efforts to sort out and plan their academic pursuits and accomplish in academic endeavor. Computer-based technologies are now ordinary in classrooms sitting and the combination of these medium into the teaching and learning of computer subjects is supported by government policy in most developed countries. Computer Game-based learning is a sample of an educational game tool or an E-Learning game which could help students in their studies. This game will cover question anything about computer education only. This is to provide ease of

learning to students especially the students under the Tech-Voc ICT strand in the university.

Every game aims to entertain users. Meaning a computer game should not just stop in providing additional information or knowledge about a certain factor in education. It should also give its best to exercise one's technical ability.

In this game, students will be required to have presence of mind for them to be able to read and understand the questions given and be able to think for the best choice of answer among four choices which will be presented during the game trial. This is a question and answer game and along the game process, student who plays the game will have his/her own view of statistic or score as a summary of his performance after his trial.

A game is a procedure activity, usually undertaken for enjoyment and as an educational tool. Games are samples of an art which handles most the evaluation of ideas so the main aim of this study is to

accommodate a better system process that will support the needs of every student from learning more accurate and reliable information concerning computer words as highly part of the computer technology in this present time. This will result to a better understanding and a more competitive individual.

Statement of the Problem

Students are having hard time learning in an active way inside a class having the traditional instructional materials. So this study is intended to solve the following concerns:

1. What is the demographic profile of Tech-Voc ICT students?
2. What instructional tool to be developed that would help improve the learning, understanding, and address the problem of traditional teaching method?
3. How the proposed Computer Game-based learning will be evaluated?

RESEARCH METHODOLOGY

This chapter contains the types of testing/evaluation done for the system to test its acceptability and usability. This also includes screen shots of the system’s actual processes and also discusses the assessment that covered the research design, respondents of the study, data gathering procedure and statistical instrument used.

Research Design

Table 1: Population and Sample Distribution of Respondents According to Grade Level (N=62)

Respondents	Population (N)	Sample (n=48)	Percentage
Senior High school Students			
Grade 11	37	37	59.67
Grade 12	25	25	40.33
Total	62	48	100

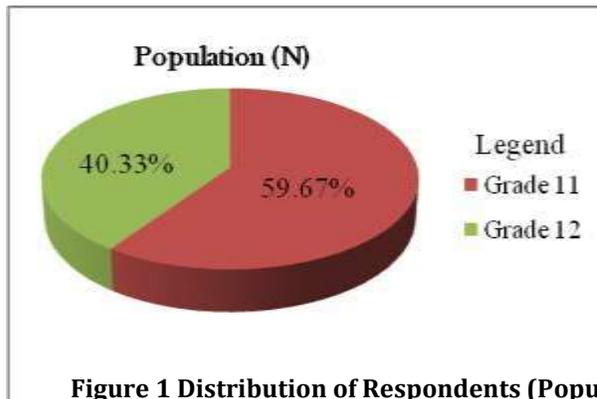


Figure 1 Distribution of Respondents (Population)

The researcher used descriptive/evaluative method of this study. This study adopted the IBM Computer Satisfaction Questionnaire. During the evaluation period, the researcher have prepared questions as an evaluative tool in accordance to the requirements and objectives of the study. The evaluation that has been made was aiming to measure the performance of the proposed study in order to come up with progressive way of development.

Efficiency Testing – End User

The end user of the study could be any person from the Senior High School. It could be in a form of a student or any of the instructors. But during the evaluation period the researcher uses a student to evaluate as the system end user. Since the study is aspiring as one sample of a Computer Aided Instruction (CAI). The efficiency testing of the system was made to check and verify that all the requirements were able to meet.

Respondents of the Study

In getting the number of respondents, the researcher take the whole class population of the Grade 11 and Grade 12 of the Tech-Voc ICT strand of the Senior High School students. The researcher used the Samples and Sampling Technique to get samples for the collection of information needed by the researcher. Based on the actual data gathered, there was a total population of 62 total enrollees in the Senior High School Tech-Voc ICT strand for the school year 2016-2017, 37 for Grade 11 and 25 for Grade 12 respectively.

Instrument

The instruments used in gathering the data were the IBM Computer Usability Satisfaction Questionnaire, interview, and research. The researcher conducted interviews using the structured questionnaire to understand the respondents’ remark on the recent computer trends that they know. This was used by the researcher in gathering data which is essential to craft the Computer Game-based Learning reliable, efficient and effective to the users.

The data gathered was analyzed to appreciate fully the performance of the Computer Game-based Learning and to know the drawbacks of the traditional teaching method in order to provide possible solutions that will help in making the proposed Computer Game-based Learning a better one.

Statistical Tool

The evaluation was made to test if the system met the satisfaction and expectations of the users. After the evaluation of the respondents using the structured questionnaire the researcher calculated the results of

the assessment. The formula used by the researcher in determining the result of the questionnaire included the formula for getting the Mean values and the qualitative description in determining the level of usability of the proposed Computer Game-based Learning.

Quantitative Description

Scale	Mean Score	Interpretation
5	5.00 – 4.51	Strongly Agree
4	4.50 – 3.51	Moderate Agree
3	3.50 – 2.51	Neither Agree or Disagree
2	2.50 – 1.51	Moderately Disagree
1	1.50 – 1.00	Strongly Disagree

RESULTS AND DISCUSSION

This chapter presents, analyzes the results and discussion of the data which provide answers to the questions raised in the study.

Respondents Profile Results

Gender. Data on gender of respondents are presented in table 2

Table 2 Age of the Respondents

Gender	Age Group			Total
	16 Years old or Younger	17-19 Years Old	20 Years Old or Older	
Male Percentage	5 (20%)	19 (76%)	1 (4%)	25 (100%)
Female Percentage	8 (22%)	29 (78%)		37 (100%)
Total Percentage	13 (21%)	48 (77%)	1 (2%)	62 (100%)

Table 2. Shows that the most of the respondents age ranges 17 to 19 years old (n=62,77%)

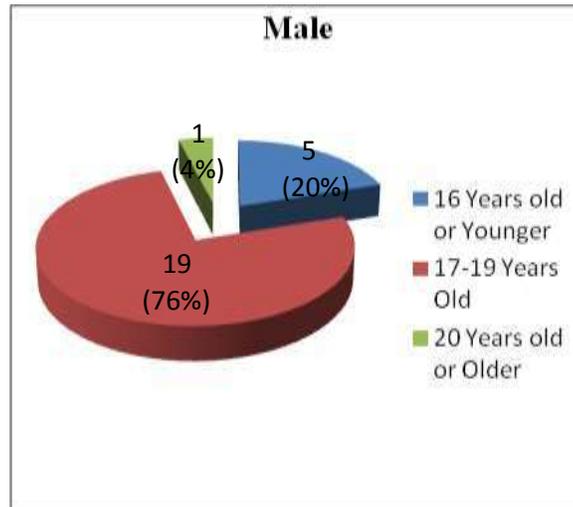


Figure 4 Age of Respondents (Age Group)

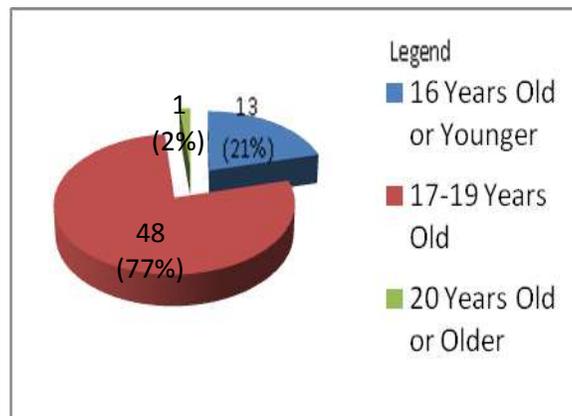
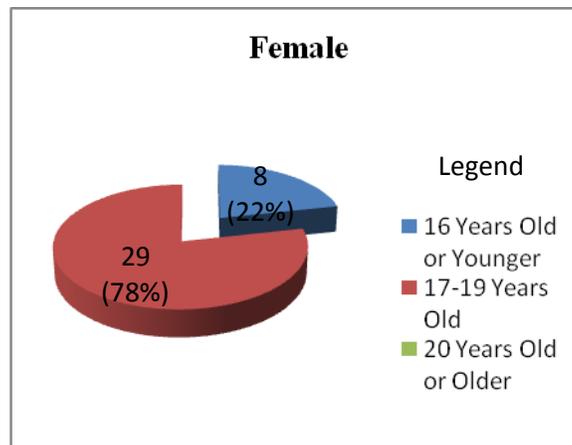


Table 3 Gender Respondents
N=62

Gender	Respondents	Percentage
Male	25	40.32
Female	37	59.68
Total	62	100

Table 3 shows that out of the 62 students in the Tech-Voc ICT strand 25 or 40.32% were male while 37 or 59.68 % were female. The data reveals that the gender of respondents of the Senior High School Tech-Voc ICT strand in ESSU Borongan was dominantly female.

Table 4. Shows the Computer Satisfaction rating of the Computer Game-based Learning System.

IBM Computer Usability Satisfaction Metrics							
Criteria Evaluated	Strongly Agree	Moderately Agree	Neither Agree or	Moderately Disagree	Strongly Disagree	Weighted Mean	Interpretation
	5	4	3	2	1		
1. It was simple to use this system	58	3	1	0	0	4.9	Strongly Agree
2. Can effectively complete the task using this system	55	4	2	0	1	4.8	Strongly Agree
3. I am able to complete my work using this system	52	6	4	0	0	4.7	Strongly Agree
4. I feel comfortable using this system	60	1	1	0	0	4.9	Strongly Agree
5. It was easy to use this system	58	3	1	0	0	4.9	Strongly Agree
6. Whenever I make a mistake using the system, I recover easily and quickly	55	4	3	0	0	4.8	Strongly Agree
7. The organization of the information on the system is clear	51	7	4	0	0	4.7	Strongly Agree
8. The interface of this system is pleasant	53	5	4	0	0	4.7	Strongly Agree
9. I like using the interface of this system	59	2	1	0	0	4.9	Strongly Agree
10. Overall, I am satisfied with how easy it is to use this system	54	5	3	0	0	4.8	Strongly Agree
Average weighted Mean						4.8	Strongly Agree

The respondents of the study were the Grade 11 and Grade 12 students enrolled in the Tech-Voc ICT strand. To answer the performance of the Computer Game-Based Learning majority of the students highly evaluated and tested as “**Strongly Agree**” and efficient instructional tool in students learning. In relation, the performance of the Computer Game-Based Learning the variables were evaluated and the

FINDINGS, CONCLUSION AND RECOMMENDATION

Findings

Senior High School is offering computer related strand like Tech-Voc ICT track. This track have subject Introduction to Computing. Teaching this subject requires thorough discussion for the better understanding of the student. Traditional teaching method may not cater all the level of learning of the students especially those slow learners. During complicated topics, the student sometimes finds it hard to ask the instructor to repeat the discussion.

For the development of the study, the researcher conducted an interview to acquire the needed information. The structured questionnaire was used in evaluating the performance of the Computer Game-Based Learning and have those students enrolled from Tech-Voc ICT in the School Year 2016-2017 as the respondents.

The gathered data were analyzed statistical and computed. Based on the gathered data from the researcher’ respondents, the overall weighted mean of the evaluation in terms of performance of the Computer Game-Based Learning were 4.6 and rated as “**Strong Agree**” in general.

Conclusion

table reveals the summary of the overall weighted mean of the system evaluation were **4.8** which rated as “**Strongly Agree**” in general. In this study, the result has shown the positive response of the respondents in all areas in terms of performance Evaluation of the Computer Game-Based Learning.

After the evaluation on the proposed Computer Game-based learning the researcher had the following conclusions:

1. That the proposed Computer Game-based learning can give the students freedom on where, what and when to study.
2. That the proposed Computer Game-based learning can provide an immediate Feedback on the answered quiz.
3. That the proposed Computer Game-based learning provides a lively interaction on learning of the subject. Thus, the proposed Computer Game-based learning is effective as a Self-Paced Learning, and Interactive Learning.

Recommendation

Given with the conclusions, it is thereby recommended that the system would be implemented to meet the desired solutions to the problems and to benefit the students, the faculty and staff of the Senior High School, the future researcher who will be referring into this study and most especially to acknowledge the honor of the researcher in making this study a success.

Screen Shots

This contains the image created by copying all the parts or all of the displays on a computer screen at a particular process to demonstrate the use of a piece of software.



Figure 7 Splash Form

This appears upon starting the game. This consist the title of the study and a timer in loading the progress bar.



Figure 5 Enter Name Form

Is where the player name is being entered. It contains two different buttons which serves as the choices of the player whether to continue or to cancel



Figure 6 Menu Form

Right side of the Menu Form contains the buttons and other options to be clicked by the user and right side of the form is the tooltip text which function is to display the brief description per button upon mouse move.



Figure 7 Hall of Fame Form

This form includes all the high scores of all the categories.



Figure 8 Option Form

Option Form contains the setting of the status of the game sounds, Maintenance and Done button.



Figure 9 Admin Log Form

This form is exclusive only for the end user. Whenever the button Maintenance in the Option form has been clicked then, Log Form will automatically appear.



Figure 10 Maintenance Form

This form appears right after the log in process has been granted. This contains two buttons to be clicked whether to proceed with the Subject maintenance or to proceed with the Question maintenance.

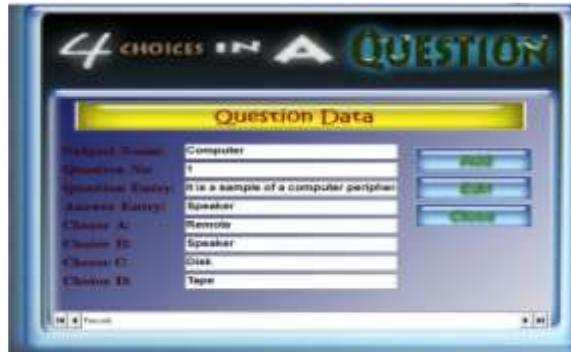


Figure 11 Question Form

This is where the end user can add, edit and delete Question entry.



Figure 12 Category Form

This form appears upon clicking the button Subject Entry in Menu form. There are three buttons in yellow color which indicates the three major categories of the game.

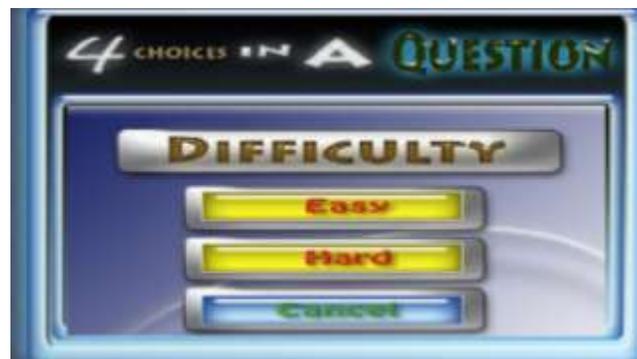


Figure 13 Difficulty Form

Difficulty Form contains the two different level of difficulty of the game, namely the Easy and the Hard level.



Figure 14 Instruction A Form (Hard Level)

This form contains the first instruction of the Hard Level.



Figure 15 Main 2 Form (Hard Level)

Main 2 Form for Hard level has a timer between the choices. Then 3 buttons located at the right side of the form namely, Play, Pause and Quit button.

REFERENCES

1. Shaffer, D, W. *How computer games help children to learn.* 2007
2. Joyce, A., Gerald, P., & Derby, M. *How are Digital Games used in Schools.* 2009
3. Honey, M. A., & Hilton, M. (Eds). *Learning Science through Computer Games and Simulations.* 2011
4. Virvou, M.K.G., dan Manos, K, "Combining Software Games with Education". 2005
5. Paraseva, F., Mysirlaki, S. & Papagianni, A., *Multiplayer online games as educational tools: Facing new challenges in learning.* 2011
6. Lardizabal, *The Success of Teaching-learning process is determined by the performance and effectiveness of the instructors.* (2000)
7. Darling-Hammond, L., *Teacher quality and student achievement: A review of state policy evidence, Education Policy Analysis Archives,8(1),* 2000
8. Chris Dede, *Raid Advances In Information Technology Are Reshaping The Learning Styles of Many Students in Higher Education.* (2005)
9. Dockstader, *Technology Integration is using Computers Effectively and Efficiently in the General Content Areas.*
10. Carrison, and Vaughan, *Blended Learning,* (2008)
11. Ebner, M. and Holzinger, A. *Successful implementation of user-centered game based learning in higher education: an example from civil engineering, Computers and Education,*(2007)
12. Sandford, R., Ulicsak, M., Facer, K. and Rudd, T. *Teaching with games: using commercial off-the-shelf computer games in formal education,* (2006)
13. Carbon, M., Szafron, D., Cutumisu, M., and Scaefffer, J. *Computer-game construction; A gender-neutral attractor to Computing Science. Computer Education.*(2010)
14. Cuenca Lopez, J. M., and Martin Caceres, M. J. *Virtual games in social science education. Computer And Education.* (2010)