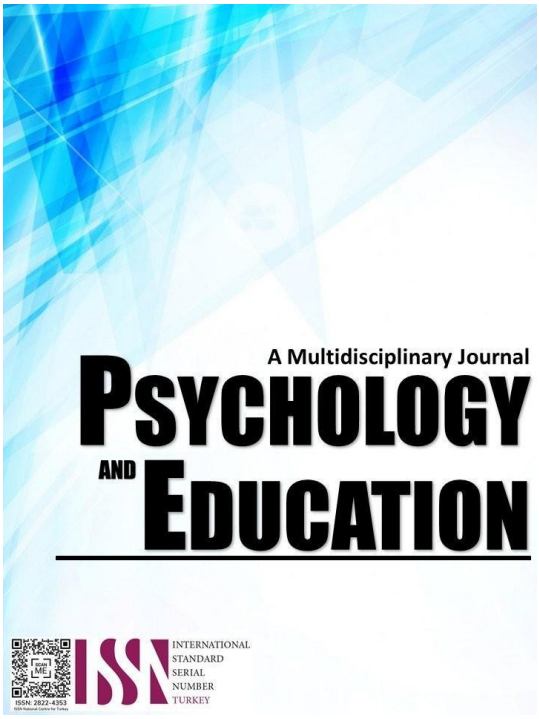
GRADE 11 ICT STUDENTS' MASTERY LEVEL IN SETTING UP COMPUTER NETWORKS INSTRUCTED USING CSS DROID



PSYCHOLOGY AND EDUCATION: A MULTIDISCIPLINARY JOURNAL

Volume: 17
Issue 2
Pages: 165-168
Document ID: 2024PEMJ1552
DOI: 10.5281/zenodo.10667040
Manuscript Accepted: 01-24-2024

Psych Educ, 2024, **17**(2): 165-168, Document ID:2024PEMJ1552, doi:10.5281/zenodo.10667040, ISSN 2822-4353

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Research Article

Grade 11 ICT Students' Mastery Level in Setting Up Computer Networks Instructed Using CSS Droid

Mark Wendhelle Jeff A. Aquino*
For affiliations and correspondence, see the last page.

Abstract

This research endeavor aimed to find out whether the use of Computer System Servicing (CSS) Droid application would improve the mastery level of grade eleven students on the topic setting up computer system networks. The study made use of Single subject research design particularly the one-group pretest-posttest design. Fifty-seven students were used as respondents of the study. Mean and t- test were used as tools in the analysis of data. The results of the study revealed that there was a significant difference in the pretest and posttest mean scores of the respondents in the topic setting up computer system networks. It can be concluded that the mastery level of students was greatly enhanced after CSS Droid application was employed in teaching the lesson. Therefore, the employment of CSS Droid was effective in teaching setting up computer system networks. Furthermore, it was recommended that the CSS Droid app be used as intervention material or strategy in teaching the concepts setting up computer system networks.

Keywords: *droid application, intervention material, strategy, computer network*

Introduction

Information and Communication Technology (ICT) in education is the mode of education that use information and communications technology to support, enhance, and optimize the delivery of information. (Linways Technologies, 2017)

In these changing times, students are more driven towards using a mobile phone for every purpose. A smartphone they call it. The world is at your fingertips, and a student can access any information anywhere. This reduces the chance of visiting a library and searching for the data. Hence, a mobile phone can be used for a number of such purposes. What makes the information easily available is mobile applications. Every mobile app has a unique feature that offers its own set of services. (Roy, 2017)

A study conducted by Foti et al. (2014) stated in their findings that students turn their mobile devices into learning tools through mobile applications, or "apps". Apps prove to be useful resources in that they provide the user with instant access to specialized information in a manner that is faster and more efficient than using search engines. Unlike web resources, apps require fewer selection steps and keystrokes to access information as their content is highly targeted and specific to an area of interest.

Following the overall vision of the Department of Education (DepEd), our vision is "21st Century Education For All Filipinos, Anytime, Anywhere." This means an ICT-enabled education system that transforms students into dynamic lifelong learners and values-centered, productive, and responsible citizens. (DepEd ICT4E Strategic Plan, 2015)

Current ICT integration in education remains a large task. For example, student-computer ratios and teacher-computer ratios can be improved. The education system lacks infrastructure for connectivity and access to technologies. While most teacher training institutions (TEIs) have incorporated computer courses into their curriculum as a requirement for graduation, computer literacy is not a requirement for teacher certification/licensure. Partly for this reason, in-service training is generally limited to basic computer literacy. (DepEd ICT4E Strategic Plan, 2015)

Learning is a continuous process, and the focus has now completely shifted to eLearning. Due to mobile phones and the various feature-oriented applications, students can learn at their own pace and take their time to understand things, as everything is just a click away (Roy, 2017) or simply self-paced learning.

Self-paced learning is defined as a specific learning method in which the learner can control the amount of material they consume as well as the duration of time they need to learn the new information properly000 (Hubauer, 2018). Using CSS Droid, learning and setting up computer networks will become flexible because students can learn whenever they feel like it and wherever they feel like it.

One of the features of the K to 12 programs of the Department of Education is offering Technology-Vocational-Livelihood courses for Senior High School, particularly the Information Communication Technology strand with the specialized subject in Computer Systems Servicing, and one of the competencies is setting up computer networks.

The researcher observed from his previous classes that grade 11 students have encountered difficulties in setting up computer networks, thus, from the teaching perspective, the CSS Droid is encouraged to attain maximum potential growth and development of the students.

Hence, this action research was conducted and geared towards the effective use of CSS Droid to increase the mastery level of grade 11 students in setting up computer networks at Bintawan National High School.

Research Questions

This action research aimed to improve the mastery level of Grade 11 ICT students of Bintawan National High School in setting up computer networks using ICT-based learning materials.

1. What is the mastery level of Grade 11 ICT students of Bintawan National High School in setting up computer networks before and after the implementation of CSS Droid?
2. Is there a significant difference in the mastery level of Grade 11 ICT students in setting up networks before and after the implementation of CSS Droid?

Methodology

A descriptive comparative type of research was employed, and a quantitative method was utilized. The data gathered were used primarily to describe students' level of mastery in setting up computer networks. This study used twenty-one test questions for the pre-test and post-test. Single-subject research design, particularly the one-group pretest-posttest design, was employed to examine the effectiveness of the Computer System Servicing (CSS) Droid on students' mastery level in setting up computer networks. The respondents were the fifty-seven Grade 11 students of Bintawan National High School. The CSS Droid was the main instrument. It is an android-based learning material downloaded from Play Store developed by Eton A Rondero, Robin L. Villaruel, Adrian Florence Lopez et al. Further, CSS Droid has different 4 phases: (1) Introduction to CSS Training; (2) Install and Configure Computer System; (3) Set Up Computer Networks; and Set Up Computer Servers. On each phase, students have to pass the checkpoint/test to unlock the next phase.

The application was used during the Independent Cooperative Learning (ICL) schedule. The students downloaded and installed the application in their android mobile phones and this was a self-paced learning.

The students were given the pretests and posttest before and after the treatment and their scores in every treatment was tallied and interpreted by the researcher to determine whether there is or there is no significant differences on their mean scores in the pretests and posttests.

To describe the level of mastery of the grade 11 students in setting up computer networks as indicated by their scores in the pretest and post test scores, mean and standard deviation were utilized. Mean scores were transformed to mean percent and were described using the table next page.

Table 1. *Mastery Level Description Equivalent*

Mean Percent	*Mastery Level*	*Description*
96-100	Advanced	Without the assistance from the teacher
86-95	Meets expectations for target	Needs little assistance from the teacher
35-85	Partial mastery of target	Demonstrates partial understanding, or can perform portions of the target with assistance
0-34	Little or no mastery	Cannot demonstrate mastery even with instructor assistance

DepEd NAT Interpretation and Standard-based rating (2019)

Participants

This study will be conducted in Bintawan National High School, particularly in the Grades 11 ICT 1 and 2 for the School Year 2019-2020 who undertake Computer Systems Servicing as their specialization subject. There will be thirty (30) participants in Grade 11 ICT 1 and thirty (30) participants in Grade 11 ICT 2 for a total of sixty (60) participants.

Procedure

This action research will determine if there is a significant change in the student's mastery level in learning Setting-up Networks in the subject Computer Systems Servicing by using mobile applications, particularly the CSS Droid of Grade 11 students of Bintawan National High School, Second Semester, School Year 2019-2020.

A pre-assessment of the student's previous knowledge about networking will be done during the first day of classes. This result will be recorded and tallied. After one semester of teaching and integrating the use of CSS Droid, a post-assessment with the same content as the pre-assessment will be conducted for the participants.

The proponent will use an evaluation sheet adopted using the Self-Assessment Guide from the Technical Education and Skills Development Authority in Computer Systems Servicing NCII under the Setting Up Computer Networks Competency.The results of the pre and post-evaluation will be compared, analyzed, and interpreted using appropriate statistical tools.

Results and Discussion

Frequency distribution table of Students' level of mastery in setting up computer networks: a) prior to the intervention; b) after the intervention instructed by Computer System Servicing (CSS) Droid

Table 2. *Frequency Distribution table on the Mastery Level of Students in setting up computer networks before and after the intervention*

Level of Mastery	*Pretest*		*Posttest*	
	f	*%*	*f*	*%*
Advanced	0	0	38	66.67
Meets Expectations for target	0	0	4	7.02
Partial Mastery of target	7	12.28	14	24.56
Little or No Mastery	50	8.72	1	1.75
Total	57	100	57	100

Surfacing in Table 2 is the mastery level in setting up computer networks prior and after the intervention. Results revealed that most of the students have a little or no mastery on the learning competency, 7 (12.28%) students have partial mastery before the intervention. After the intervention, there was only 1(1.75%) student who has little or no mastery or cannot demonstrate even with the assistance of the teacher, 14(24.56%) student have partial mastery, 4 (7.02%) who have met the expected target and 38 (66.67%) students have advanced mastery.

The table further reveals that, after the utilization of Computer System Servicing (CSS) Droid as an intervention, there was a great decreased number of students who have little mastery in setting up computer networks. Interestingly, more than half of the total number of students have advanced level of mastery.

Students' level of performance in setting up computer networks: a) prior to the intervention; b) after the intervention instructed by Computer System Servicing (CSS) Droid

Table 3. *Performance Level of Students in setting up computer networks*

n	*Pre-Test %*	*Description*	*Post Test %*		*Description*
Mean Percent Score	57	11.95	Little or No Mastery	89.31	Meets Expectations for target
Std. Deviation		20.38		18.84	

A careful examination of Table 3 shows that before the learning unit, a mean score of 11.95 (little or no mastery) surfaced as the level of mastery of the students and 89.31 (meets expectations for target) level after employing Computer System Servicing (CSS) Droid in setting up computer networks. This would show that there was an increase of 77.36 in the mean percent score of the students before and after the intervention.

Further, the results indicate an increase in the students' mastery level in setting up computer networks from pre-test to post-test exams.

Significant difference between student's level of mastery before and after the intervention.

Table 4. *Paired Sample T- Test*

	n	*Mean*	*Std. Error Mean*	*t*	*df*	*Sig. (2-tailed)*
Pretest	57	11.95	3.94	19.63	56	.000*
Posttest		89.31				

*significant at the 0.05 level.

As can be gleaned in Table 4, there is a significant difference in the mean scores obtained from the pre–test (11.95) and post-test, which (89.31) results, as evidently shown by its p-value of 0.000 with a t-value equal to 19.63. This tells that the strategy, which is the use of CSS Droid, is effective in improving the mastery level of the students in setting up computer networks.

The experiential learning theory supports this finding. Experiential learning theory defines learning as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience"(Kolb 1984). Learning by doing is a key concept and has a long history in Experiential Learning. Instead of giving a lecture, the teachers in this theory function as facilitators with the use of the CSS Droid, which is to aid the students when it comes to their own understanding.

Further, a study conducted by Nuestro (2018) concluded that the use of CSS Droid application was able to get a result statistically extremely significant difference in the academic performance of the respondents. Furthermore, Dahar (2011) investigated the effect of instructional materials' availability on students' academic performance. He mentioned that instructional materials play a very important role in the teaching-learning process.

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Affiliations and Corresponding Information

Mark Wendhelle Jeff A. Aquino
Bintawan National High School
Department of Education – Philippines