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The Core: An Instructional Learning Package for Core Competencies in Computer Systems Servicing

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ABSTRACT

This study was conducted to develop and evaluate an instructional learning package for core competencies in Computer Systems Servicing (CSS) following a descriptive–developmental–evaluative research design. The respondents included 75 Grade 10 TLE-ICTCSS students, two CSS teachers, two TESDA assessors, one LRMDS supervisor, and one Education Program Supervisor in Camarines Norte. Findings revealed that only a small percentage of students could possibly pass the four core competency clusters (COCs) based on the TESDA Self-Assessment Guide, with none qualifying for National Certificate II. To address this gap, the researcher developed an instructional learning package entitled "THE CORE," consisting of four print modules, a teacher's guide, and non-print resources such as interactive PowerPoint presentations and instructional videos. The package integrated four core competencies: installing and configuring computer systems, setting up computer networks, setting up computer servers, and maintaining and repairing computer systems and networks. Evaluation using the LRMDS rating sheet showed that both print and nonprint resources passed in terms of content, format, presentation, organization, instructional quality, and technical quality, with minor revisions recommended for accuracy and design. Conclusions highlighted that students were not yet ready for NC II assessment, but the developed package provided an innovative instructional resource aligned with DepEd's CSS curriculum and TESDA standards. Recommendations included conducting hands-on assessments, updating the package for compatibility with multiple platforms, encouraging regular practice, and utilizing the package in Junior and Senior High School to enhance competency mastery and readiness for national certification.

Keywords: *Computer Systems Servicing, instructional learning package, TESDA, core competencies, DepEd curriculum, National Certificate II, educational innovation, resource evaluation, TLE-ICT, LRMDS*

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INTRODUCTION

Education plays an important role in shaping the current situation and the future of the society and its citizens. Through its multi – faceted road for development, the students are able to acquire the proper attitude, values and aspirations that will lift them in achievement of their maximum self – realization. This has started even in the earliest of Philippine Educational system which has been through different paths of progress as the years go by.

The Spanish, American and Japanese colonization drew the gridlines of our educational system wherein it became folds of different folds to arrive to the decision of further evolution which led to the phasing out of the old 10-year education system. The implementation of the K to 12 Curriculum seeks to supplement the urgent and critical need of enhancing the quality of basic education in the country. The program provides sufficient time for mastery of concepts and skills and development of lifelong learners. With the advent of increasing sustainable jobs for the Filipinos, the competencies laid by this new curriculum has been seen as the prime weapons of the students. One of the learning areas of this curriculum is the Technology and Livelihood Education or TLE. This subject teaches high school students the basic fundamentals of technicalities that can be found in their everyday life. As early as Grade 7, the K to 12 program trains students in joining the workforce. The TLE subjects in junior high school follow the rules set by the Technical Education and Skills Development Authority (TESDA), a government agency tasked to manage and supervise technical education and skills development (TESD) in the Philippines. This allow the students to earn a National Certificate (NC) required by the industry. In Grade 7 and 8, exploratory mini courses are being introduced to the students once every grading period. No duplication of mini course shall be offered to the students. Every student has the chance to explore the four main TLE courses: Agri-Fishery Arts, Home Economics, Industrial Arts and Information and Communication Technology (ICT). Schools must offer a maximum of four TLE mini or exploratory courses in Grade 7 and another four in Grade 8 as per locality's needs and school assets. The exploratory courses serve as a preliminary in earning a Certificate of Competency (COC) in Grade 9 and an NCI/NCII in Grade 10.

In Grade 9, the student chooses one course to focus on from among the mini courses in Grade 7 and 8. Under this level, the student can earn a Certificate of Competency (COC). When the student reaches Grade 10, the student pursues the TLE specialization course in Grade 9. This allows the student to get at least an NC level I or II based on the TLE course. An individual need to undergo competency assessment for the identified qualification in any of the accredited assessment centers nationwide.

In senior high school, on the other hand, students study core compulsory subjects and a required specialty. They can choose from the three main tracks such as Academic, Technical-Vocational-Livelihood (TVL) and Sports and Arts. The student chooses TVL, and continue the TLE course in Grade 9 and 10. This will allow the students to earn NCII that can be used as credentials in applying for a job after SHS graduation.

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The legal basis of teaching TLE is also known as RA 10647 which is an act strengthening the ladderized interface between technical vocational education and training in higher education. In teaching TLE, several elements are being considered such as real-world task, ill-defined problem, multiple sources, collaboration, reflection, interdisciplinary perspective, integrated assessment, polished product and multiple interpretations and outcomes

R.A. 7796 on the other hand, strengthen the implementation of a basic education through a ladderized system of course implementation of program between the TESDA and DepEd. The Department of Education take charge of providing basic and essential education among students while those students who prefer to venture into a career tract is trained and prepared under joint venture of TESDA and DepEd. TESDA provides the training to teachers and instructors which includes granting them the certification to teach skills of their own preference, students are trained under the Department of Education thorough these teachers and instructors while the assessment, calibration and certification of the acquired skills are done by the TESDA. Additionally, the RA 10533 implements the enhanced of Philippine basic education thus providing more and strengthened opportunity to students who prefer to venture into technical vocational track. The teachers qualification are enhanced and teachers are trained further to ensure quality technical instruction. Courses offered under this strand is a preparation to collegiate courses or could already be a means of vocation and livelihood. Enlightening the students, guiding them on what career track suited their ability, skills and inclination best thus is deemed necessary as it could be a long-term effect. The track that they would chose should merit to their in-born talents and expertise much more with their inclination. These young minds thus need to be guided as they are too premature to identify a lifelong career path that would affect them for the rest of their lives.

Computer Systems Servicing (CSS) is one of the specializations offered in TLE-ICT in Junior high school and in ICT strand in Senior High School. This is a course designed to develop knowledge skills and attitudes of a Computer Service Technician in accordance with industry standards. It covers common and core competencies that will help the students to acquire technical skills in order to earn a national certificate. Because of the inclination to modernization which entails the use of computers and its systems, many students would choose to take this specialization.

Many of the students and even their parents prefer Tech-Voc because it is affordable and hands – on. Furthermore, it offers a better promise of good job in the future which is why the Department of Education continues to improve the quality of Tech-Voc program through the provision of CompetencyBased Curriculum, Teacher's Training, acquisition of physical facilities and development of instructional materials and resources. Last 2018, about 600,000 SHS graduates are expected to join the workforce and the 480,000 of it are graduates with specialization in various technical, vocational and livelihood programs.

One of the best ways to harness skills of the students is the use of instructional learning packages which are autonomous and self – paced to further advocate student – centeredness. As supported by several studies, just like the study of Sritaratorn and Sombunsukho (2011), they found out that the computer

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instructional package for a multimedia program could increase learning effectiveness and it was good enough to be used for self-study. With this, the researcher believes that the creation with one will be very effective for Grade 10 TLE-ICT students and for other students taking Computer Systems Servicing specialization. Moreover, the researcher being a teacher major in TLE-ICT and also a National Certificate holder in Computer Systems Servicing, noticed that the existing modules in Junior High School for the TLE-ICT subject are outdated and he also believes that a more comprehensive instructional resources, just like instructional learning packages will be a big help for the students to acquire the skills with mastery needed for them to pass the TESDA assessment and earn a National Certificate (NC). It will also help teachers to save time and effort in demonstrating lessons on CSS. Moreover, the researcher has a goal of uploading an instructional resource in the LRMDS portal in order to contribute something in the Department of Education that will help other educators in improving students' performance in TLE-ICT-Computer Systems Servicing specialization.

Statement of the Problem

This study aimed to develop and evaluate an instructional learning package for core competencies in Computer Systems Servicing (CSS). Specifically, it sought answer to the following questions:

1. What is the initial performance assessment of the student respondents in Computer Systems Servicing as revealed in the TESDA self-assessment guide?

2. What instructional learning package can be developed for core competencies in Computer Systems Servicing?

3. What are the core competencies that can be integrated in the instructional learning package?

4. What is the evaluation of the evaluators in the developed instructional learning package using the LRMDS evaluation rating sheet?

5. What are the recommendations made by the evaluators that can be integrated in the instructional learning package in order to enhance it?

Significance of the Study

The researcher believes that the developed and evaluated instructional learning package for core competencies in Computer Systems Servicing would be beneficial to the following:

Students. TLE-ICT students taking Computer Systems Servicing specialization will be benefitted by this instructional learning package in a way that it will guide them to master the core competencies/skills in CSS in order to pass the TESDA assessment and earn a National Certificate.

TLE/TVL Teachers. The output of this study will be very beneficial to TLE/TVL teachers because they could save time and effort in delivering the lesson to the students since, the proposed instructional learning package advocate student-centeredness. Moreover, the package is updated and comprehensive and will require just a minimal supervision/guidance to their students.

Other Teachers. The proposed learning package will also be beneficial to those teachers who wants to get a National Certificate in Computer Systems Servicing, they don't need to pay for the trainer because the instructional learning package itself is autonomous and self-paced and the content will focus on the core competencies of CSS.

Administrators. The usefulness of the proposed instructional learning package can be recommended by administrators to their subordinates specifically to TLE/TVL ICT teachers considering the fact that modules in ICT, if not outdated, are still lacking in the field.

The Community. When this study is realized and placed into implementation, the community as a whole will be benefitted because they will be filled with young people who are skillful and capable of learning on their own. Thus, can greatly contribute for the betterment of the community.

Future Researchers. Through this study, other researchers can conduct studies related to creation of instructional learning packages especially in those subject areas which still need additional learning materials. Other studies along this concern may shed further insights for improvement or enhancement purposes of other instructional learning packages in the field (if there's any).

Scope and Delimitation of the Study

The study focused on developing an instructional learning package for core competencies in Computer Systems Servicing. It also identified the initial performance assessment of the student respondents in Computer Systems Servicing as revealed in the TESDA self-assessment guide and the evaluation made by the evaluators in the developed instructional learning package using the LRMDS evaluation rating sheet for print and non-print resources. Furthermore, this study also looked into the recommendations given by the evaluators which can be integrated in the instructional learning package in order to enhance it.

The developed instructional learning package was evaluated by the evaluators coming from 3 selected public schools in Sta. Elena cluster offering Computer Systems Servicing specialization in Junior High School, consisting of 75 Grade 10 TLE-ICT-CSS students, two TLE-ICT-CSS teachers, two TESDA assessors and an Education Program Supervisor in TLE in Camarines Norte. However, the LRMDS supervisor was not able to evaluate the package due to the tasks assigned to her and to the COVID pandemic.

The study was conducted during the 3rd and 4th Quarter of the SY 2019-2020.

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Definition of Terms

The following important terms were used in the study and were defined conceptually and operationally to establish a common frame of reference which were used in the analysis and interpretation of the findings of this research:

Computer Systems Servicing (CSS). This refers to a course designed to develop knowledge, skills and attitudes of a Computer Service Technician in accordance with industry standards. In this study, this refers to the specialization in ICT offered in Junior High School TLE-ICT. This also refers to the subject of the study in which the instructional learning package will be made.

Core Competencies. This refers to the main ability or skill (Webster 2002). In this study, this refers to the core skills that needs to be mastered in Computer Systems Servicing. This includes: (1) install computer systems and networks; (2) diagnose and troubleshoot computer system; (3) configure computer systems and networks; and (4) Maintain computer systems and networks.

Information and Communication Technology (ICT). This refers to the study or business of developing and using technology to process information (Beal, 2012). In this study, this refers to one of the learning strands offered in Junior High School-TLE and Senior High School-TVL track. Computer Systems Servicing belongs to this strand.

Instructional Learning Package. This refers to documents/materials containing all that is necessary for a student to attain one or more educational objectives independently of the teacher (Guilbert, 2008). In this study, this refers to the material that will be developed for Grade 10 TLE-ICT students focusing on the core competencies in Computer Systems Servicing which includes printed materials such as modules for students, containing lessons in CSS, module for teachers as guide in delivering the lesson and non-print materials such as CD containing PowerPoint-based consolidated tutorial videos.

Recommendation. This refers to the suggestion about what should be done (Webster, 2002). In this study, this refers to the suggestions to be given by the experts and evaluators that can be integrated for the enhancement of the developed instructional learning package in ICT-Computer Systems Servicing.

LITERATURE REVIEW

Literature

A Learning Resource Package is a collection of materials used to conduct a course—whether a traditional, group-based course or another type of learning event. Components of a learning resource package usually include, but are not limited to a reference manual, participant's handbook, trainer's notebook, and presentation graphics. *(http://reprolineplus.org)* A Professional Learning Packages (PL Packages) for

teaching literacy were designed in Tennessee. These were designed to deepen educators' understanding of key topics related to literacy instruction. These packages were used by the different districts in Tennessee and based around Tennessee's professional learning standards. Each PL package is consisted of series of connected lessons (designed for 25-60) minutes which are action-oriented and have tangible outputs that can be used by teachers in the classroom. These were designed to be led by a learning facilitator and completed in a group setting with reflection and discussion.

Gunn and Pitt (2003) have mentioned in their article that in medical and biological science, Multimedia Computer Aided Learning (CAL) packages were introduced to replace the traditional lectures. They said that CAL package solved the problem of finding a suitable lecture room in a large class in a congested university timetable. They also mentioned that there's a study in which a package was evaluated by several groups of students. The experimental setup of the study is that during first year, students were allocated time to use computer rooms, then afterward, they were expected to organized suitable times to use the computer package themselves. The package was well-designed to empower students to become independent learners, rather than passive recipients of information. However, there is no strong evidence that students who were taught through CAL perform better in assessment rather than those who were taught using conventional lectures. Moreover, conventional teaching remains effective in teaching medical biochemistry in BPKIHS, Nepal, although, students enjoy supplementary computer teaching but when asked, they were still not enthusiastic about replacing their lecturers with computers.

Kaur et.al. (2015) on the other hand, found that the multimedia learning packages prepared by researcher for teaching English was more effective for academic achievement of class 8th students in English.

Watts (2007) in his article entitled *A Learner-Based Design Model for Interactive Multimedia Language Learning Packages*, discussed the design features of interactive multimedia packages for language learning. According to him, in designing an interactive multimedia packages, several approaches may be employed. He explained that technology-driven design models are dominated by hardware considerations while learner-based design models focused on the needs of users and sought to utilize to the maximum the technological resources available for learning purposes. He also cited that these approaches lead to the discussion of possible design model components for interactive multimedia programs appropriate to updated language learning requirements. The implications for program design were highlighted after each of the components were examined. He further explained that the potential of interactive multimedia for language learning is high but there was a need to develop a more learner-based orientation to realize that there's a need to break with the technology-driven models of the past.

Long (2004) have mentioned that there were two studies undertaken to determine the acceptability of computer-assisted learning (CAL) packages to general dental practitioners. The first was developed at the Bristol Dental School, which was designed to give experience in orthodontic cases assessment and treatment planning. The second was developed within Leeds Dental Institute, contained two modules, one on the surgical endodontics and the other on planning and management of dental biopsy. In the evaluation

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of the study, an identical self-administered questionnaire was completed by the respondents. The result revealed that the modules easy to use and useful. The CAL approach was rated positively compared to audio tapes, books and journals, but a less consistent pictures when CAL was compared with videotapes. The evidence for the acceptability and potential of the CAL approach to general dental practitioners were provided by the study.

Miller (1990) in his article *Developing self-learning packages* said that self-learning packages are viable, cost-effective methods of delivering instruction. He presented the step-by-step method for developing self-learning packages along with a comparative analysis of costs with the use of self-learning packages versus traditional classroom program.

Nikolajski (2002) on the other hand, suggested that self-learning packages can be a viable alternative or adjunct to traditional in-service programs for nursing staff development. He has mentioned that nursing shortage and high patient acuity levels make it difficult for nurses to attend traditional inservice programs. Moreover, time and financial constraints affect the staff educator's ability to teach needed topics to large numbers of nursing staff. Thus, he suggested the use of self-learning package to address the problem.

Vivekananda-Schmidt et.al (2004) discussed the methodological issues relating to the evaluation of multimedia-based learning tools, using the example of a specific package, Virtual Rheumatology. They discussed the reasons for the available evidence supporting the use of such tools in education, increasing interest in the area of computer-based learning, and issues about the design and production CD. To illustrate the considerable methodological difficulties in the research and evaluation of Computer-Assisted Learning (CAL) packages, they then discussed the evaluation of the package.

According to Bell (1997) of the University of Wollongong Australia, in her article entitled *Designing and using a learning package for teaching*, student-centered learning and resource-based learning (RBL) are the two of the buzzwords in tertiary education. One of the benefits of RBL is the facilitation of autonomous and reflective learning. The aim for the Introduction of Tertiary Teaching (ITT) subject for academics at Wollongong University is to facilitate reflective learning and the subject is being redesigned with RBL as one of its features to provide a modular program. The satisfaction of the diverse needs of participants and the encouragement of the "Deep Approach" to learning as identified by Marton & Siiljo (1976) were its intention, such that participants are motivated to seek meaning rather than simply passive receiver of information. Bell describes some of her experiences in the design and implementation of the first ITT module and offers some suggestions to staff interested in integrating RBL into their studies. She has mentioned that one of the advantages of the RBL module is that it gives opportunity to spend time thinking deeply about issues and the individual applicability of experience-based reflection. Moreover, some participants indicated the suitability of the RBL approach to their own perceived learning style. However, there were also some concerns in developing and implementing the ITT module and Bell suggested ideas for overcoming them.

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De Sousa (2015) from the University of Minho in Portugal wrote an article entitled *How to Deliver a Successful Learning Package for Family Medicine Trainees?* He mentioned that there were things that need to be considered in the planning stage of making the learning packages. First is, the teachers should have clearly defined the purpose of the module based in the assessment of the training needs, the knowledge and skills deficits of students and the objectives. The objectives should be clearly stated as measurable statements of what participants should be able to know and do. Ideally, the teaching and learning package must be tailored to the participants' knowledge or skills, so, the specific training needs of each trainee or group of trainees should be evaluated previously to the design of the program. Moreover, for him, certain number of skills were needed in delivering a successful learning package for FM trainees. In order to master the basic features of adult education, Family Medicine teachers and tutors should be aware of this and undergo some of the available training programs, which will also be a key element in ensuring the quality of future family physicians.

In the book entitled *Preparing Individualized Learning Packages for Ungraded, Continuous Progress Education* by Kapfer and Ovard (1971) have mentioned that individualize instruction and learning can occur when the curriculum, materials and activities are organized for self-pacing through Individualized Learning Packages (ILPs). Moreover, an individualized continuous progress curriculum allows each student to progress at his own best rate of speed, commensurate with his abilities, interest, needs and motivational patterns. In an article written by Mangunay (2013) in the Philippine Daily Inquirer, an official of Department of Education said that time constraint has forced the distribution of learning packages instead of textbook in public school to get the government's enhanced basic education program, or K to 12, up and running. According to Edwin Uy, the DepEd's program coordinator, learning packages were "more cost-effective" in ensuring that materials conform with new standards and were "faster" to publish. He said it could not be an option to took a year and a half to two years in publishing textbooks. While Uy acknowledged that the DepEd "might have missed out on certain things" in the distributed materials and said this was why it had opened its lines for comments and feedback from the field.

Smart Communications donated digital learning packages last March, 2018 to benefit Basilan learners under the Alternative Learning System. The digital learning packages provided students with mobile tools and digital contents that makes learning more fun and effective for them. Moreover, the digital learning packages composed of solar panel for recipients without access to electricity, tablets preloaded with fun educational content, and other devices. It also includes training for teachers and yearlong monitoring. The ALS Coordinator said that the learning packages' visual learning approach helps the learners to understand the lessons well and adult learners as well because they wish to learn through technology. She added that the digital learning package lighten up the heavy loads of teachers, particularly in terms of preparing visual aids. *(https://smart.com.ph)*

Last May 25, 2019 on the other hand, schools in Samar and Northern Samar received digital learning packages through the "school-in-a-bag" program led by UNICEF and in partnership with the Department of Education (DepEd), PLDT-Smart and SEAMEO-Innotech in order to improve students learning in multigrade classes. Multigrade classes are inclusive systems wherein children with different

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developmental levels, abilities and needs mix and learn together in one classroom under the guidance of one teacher. 50 portable and digital classroom packages were given. Each school-in-a-bag package handed over equipped classes with a projector, one teacher laptop and tablet in one, five student tablets, DVD player, USB memory drive, and pocket wifi with starter load. Around 2,500 disadvantaged school children were benefitted from the project. *(https://www.unicef.org/)*

Studies

Several related studies were cited to give the researcher some of the relevant insights and comparisons for his study. There were lots of studies done which mainly focused on the development and evaluation of learning packages.

In the study of Alaba and Tayo (2014), they focused on examining the level of knowledge and attitude of students to environmental education and on determining the influence of the socio-drama learning package they created about environmental hazard and pollution dangers in enhancing students' knowledge in environmental education. Pretest, posttest control group design was employed in the study wherein they randomly selected 200 JSS III students from four schools of Atakumosa-West Local Government Area of Osun State. The students were also randomly assigned into two groups: the experimental group who used the interactive drama learning package and the control group who were taught Environmental Educational concepts using the traditional method. The instruments used for data gathering in the study were survey questionnaire on students' prior knowledge of environmental education and environmental hazards, questionnaire on the effect of the interactive drama learning package on learning environmental education concepts and environmental hazards achievement test. The statistical treatment used in the data gathered were mean, standard deviation and t-test. The results revealed that interactive drama learning package was useful in broadening students' knowledge about environmental pollution and effective in the teaching of environmental education. The results further showed that the package enhanced not just the academic performance of the students, it also changed their attitude positively.

The study of Kumar and Kaor (2016) mainly focused on finding out the influence of Metacognition Integrated Multimedia Learning Package (MIMLP) on the academic performance of 100 B.Ed. trainee teachers. They examined if the performance in Educational Psychology of B.Ed. trainees taught using Metacognition Integrated Learning Package (MILP) is significantly higher than that of those who were taught through the present method of teaching. Their study revealed that there is a significant mean difference in the performance between the male and female students of B.Ed.

Sawangsri (2016) developed a Learning Package by means of the Inductive Teaching with Group Process (LPIDTGP) in his study which focused on the inductive teaching with group process and students' behavior as working in a group. Four research instruments were used in the study. Descriptive statistics were used. There were four finds that were revealed in the study.First, the effectiveness of LPIDTGP is higher than the fixed criteria. Second, the learning achievement of students is higher than the fixed criteria.

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Third, the behavior of students as working in a group, as overall, is good. Lastly, students were greatly satisfied in their learning using the LPIDTGP.

Murtafia et.al (2018) developed a learning package based on metacognitive strategies to build the students character. They used research and development approach for their study. Their research focused on metacognition strategies to build students character. The main products of learning device consisted of one RPS, and two lesson books. The methodology applied was the model 4D of research and development which is consisted of 4 phases namely defined, design, development, and disseminate. Several experts measured the validity of the device. The practicality of learning package was measured by the learning management sheet. The measurement show that the learning package had been practiced. This is indicated by the average observation results of all aspects at the 1st meeting until the 5th meeting are in good category and at 7th meeting until 8th meeting are very good category. The effectiveness of learning package was measured from 4 components – student learning outcomes, student activities, student responses, and management of student character development. The results showed that the learning package had been effective.

Also, there had been a study about computer-assisted learning packages. Gunn and Pitt (2003) in their study, evaluated the usefulness of providing students with information via website, self-assessment quiz and electronics notes. To gauged students' perceptions of each package, they used questionnaires, a computer system to monitor students' patterns of use of the electronic support and marks in the end of the module examination to measure the effect of provision of the materials on their performance. Their study revealed that CAL packages are at least as effective in imparting information as traditional lectures and that students value the opportunity to reinforce their learning through self-assessment quizzes and interactive lecture notes. However, students expressed that they would not like to have too much of their lecture time replaced by computer packages and they seemed to like a hard copy of the information for individual use. Therefore, as the study revealed, teachers must avoid overuse of computer-based packages in teaching students, instead they may use other forms of student–directed learning like problem-based tutorials. Also, the study suggested that if teachers want to support learning effectively, they should include at least as much contact time with students as in a formal lecture program.

Another computer-assisted learning (CAL) package was developed and evaluated in the study conducted by Chuthapisith (2009). The "Xerte" and "Macromedia flash" software was used to developed the CAL. Thirty-two (32) childcare students in the UK were randomly selected to watch the CAL package or to read the information leaflet containing the same information in order to evaluate its effectiveness. The aspects that were evaluated were the retention of performance, level of enjoyment, and level of confidence to identify the child with autism after interventions. The data gathered from the two studied groups was analyzed using unpaired Student's t-test, 95% confidence interval, and effect size. The result of the study revealed that those students who watched the CAL package had superior retention performance percentage scores and the level of enjoyment compared with students who read the information leaflet. However, there was no significant difference in the level of confidence to identify a child with autism. Based on the result

of the study, it was concluded that the developed CAL package was indeed an effective method of educating people who work with children about autism.

The study conducted by Hiran et.al (2019) focused on three objectives. First is to study and collect innovations and local wisdom in Sao Changok Sub The-District, Bangkhla the District, Chachoengsao Province. Second is to develop a learning package for innovations and local wisdom of Sao Changok Sub The-District, Bangkhla the District, Chachoengsao Province and third is to study the use of learning package. The research respondents were the community leaders, community scholars, school administrators, teachers, and lecturers in Bangkhla District. Standard deviation, percentage, and t-test were used to analyze the data. The study revealed that the innovation and local wisdom which should be preserved and carried on to learning management is the body of knowledge on mango: breeds, growing, harvesting, and processing of mango products in Sao Changoke Sub-district, Bangkhla District, Chachoengsao Province, the outcomes of the learning package and innovation on local wisdom resulted in a new package learning, called "Good Mangoes at Sao Changok" which is consisted of three learning activities, namely "Mango Breeds", "Mango Tree", and "Mangoes Processing Product". And lastly, the study revealed the effects of the use of the learning package in terms of students' outcomes after they had studied through learning package. It was found out that after the use of learning package, it was statistically significant at a level of 0.01. It was also found out on the other hand, that the overall students' skills were at a good level and the love and deep bound among their students who had studied through learning package was at the highest level. The study concluded that the learning package was valuable for students, schools and communities.

In the study of Taurista et.al (2017), they developed a learning package based on guided-inquiry learning model and integration of local knowledge specifically, topics about cells and tissues. A syllabus, lesson plans, and a module comprised the package. The developmental model proposed by Dick and Carey (2009) was the method employed in the study. There were three stages carried out for instructional testing, mainly, expert appraisal, small group test and main field test. The results revealed that the study produced a learning package with high validity, practicality and efficacy.

Allifianto (2017) developed and validated the effectiveness of a Physics learning package based on guided inquiry. Plomp and Nieven research design was used in the study. Three experts from UNESA validated the developed learning package. Validated sections include Syllabus, RPP Scenario, Student book, and Student Worksheet. In the validation of the package, the syllabus got an average score of 3.79 which was interpreted as with high validity. Second, the RPP Scenario got a validity score of 3.71 which was interpreted as with high valid category. Third, the student book got a validity score of 3.47 which was interpreted as with valid category. Lastly, the student worksheet got 3.71 interpreted as with high validity category. The result of effectiveness was seen after using the developed learning package. Before using the package, the students' science process skills score averaged 29.2, while after using the developed instrument, the student's science process skills score was 85.7. The results of validity and effectiveness of the learning package of Physics based on guided inquiry showed that it is suitable to be used in learning to improve student's science process skills.

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The main purpose of the study conducted by Ardinez (2001) from De-La Salle University was to develop and evaluate a self-learning module on the topic of magnetism for high school physics students. The module was developed based on the establish principles of the construction of self-learning packages. The module was evaluated by three experts in the field of physics using the validation for sourcebook form and an evaluation questionnaire. On the scale of 5 to 1, where 5 is for strongly agree to the positive statement on the aspect of the module and 1, strongly disagree, the objectives, content, manner of presentation, pretestposttest, and time allotment of the module were rated. The overall average of the evaluation is 4.3. Two of the evaluators gave it a "passed" rating and one a "passed with revision".

Ramirez (2001) of Mariano Marcos State University developed three self-learning packages on ecological concepts that include natural hazards and man-made hazards in the ecosystem. Each self-learning package contains several subtopics relevant to the study of ecology. The research-based development methodology was employed. It follows the following steps: 1) preliminary preparation; 2) detailed writing specifications; 3) writing the self-learning packages; 4) internal validation of the self-learning packages; 5) revision of the self-learning packages; 6) tryout of the self-learning packages; 7) evaluation tryout-results; and 8) modification and final production of self-learning packages. Twenty-one teacher of biology from various schools of Ilocos Norte evaluated the self-learning packages. Based from their judgement, the results showed that the self-learning packages are valid. All four criteria, objectives, content, activities and instructional characteristics were rated highly satisfactory. After suggested revisions were made, the selflearning packages were tried out to a heterogenous class of 40 second year students from Ilocos Norte National High School. The results were measured using the t-test for correlated samples, showed that there was a significant increase in the mean scores of the students.

In order to address the increasing demand for curriculum materials in Mathematics, Aguilar et.al (2016) developed and validated a prototype learning package in secondary mathematics consisting of authentic learning tasks, also known as performance tasks (PeTa), and the rubrics as assessment tools for these learning experiences. One of the significant findings of their study is that implementing performance tasks in mathematics classrooms can engage students in their transfer of deep and lifelong learning. The learning activities and experiences included in the package are mathematical modeling, storybook making, role playing, interviewing, designing (artwork, product, game), composing a song, reflective writing, problem solving, poetry writing, surveying, photography, urban planning, panel discussion, tour guiding, floor planning and comic strip writing. These tasks can be employed with the lessons in mathematics such as measurement, polygons, solid figures, angles, lines, relations and functions, variations, sequences, probability, statistics, counting techniques, equations, inequalities, systems of equations, fractions, special products, integers, logarithmic and exponential functions, plane coordinate system, and graphs of trigonometric functions, which are also included in this package. These lessons consist of concepts and constructs which are essential for students to learn that have value beyond the classroom. Their study also emphasized on the role of the arts as vital tools for the success of mathematical learning. The different forms of arts incorporated in the performance tasks included in this package are poetry, music, movement, photography, visual arts, drama, etc. Moreover, their study revealed the importance of rubrics in assessing students' works objectively. These rubrics consist of performance criteria to be evaluated depending on the

achievement levels met. Some of the criteria included in the rubrics in this learning package are the mathematical concepts, accuracy, validity, content, artistry, creativity, presentation (voice projection, facial expression, and gestures), teamwork, mechanics, unity and organization, originality, coherence, mastery, sources, appropriateness, relevance, punctuality, audience impact, and work ethics. Findings of their study highly suggest the need to implement authentic tasks in mathematics classrooms.

Ventayen (2018) conducted a needs assessment in order to determine the level of competency of primary and secondary school teachers in Lingayen, Pangasinan as a basis for an extension program. The extension program (if there is a need for training) will mainly focus on the four core competencies of TESDA's NC2 – Computer Systems Servicing Course which are advanced training in : (1) installing computer systems and networks; (2) diagnose and troubleshoot computer systems; (3) configure computer systems and networks and (4) maintain computer systems and networks. The study showed that majority of the ICT coordinators of the primary and secondary schools are competent and expert in the field of Computer Systems Servicing, because secondary ICT coordinators are holders of National Certificate Level 2 in the field of computer systems servicing. It is concluded in the study that teachers holding computer laboratory are able to sustain the need if problems arise. It is recommended that trainings are not needed by the teachers.

An android-based simulation app in computer systems servicing which could be utilized by students with learning disabilities was developed in the study of Nuestro (2018). The participants were the eighteen Grade 9 students with learning disabilities from selected schools in the Division of Cavite Province. The students were assessed by the SpEd Coordinator, Guidance Counselor, and class adviser. The study focused on six research questions about the system development stages, the level of acceptability of the developed system based on ISO 25010, the improvement in the developed system after the validation process, the level of performance of students before and after the simulation training, the extent the simulation training affect the academic performance of students with learning disability in ICT and the strategic model that can be developed to improve the academic performance of students with learning disabilities. The research instruments used were the Pre-test/Post-test questionnaires. The results were examined using the T-test, Friedman's Two-Way Analysis of Variance by Ranks for Related Samples which were used to investigate the level of performance of students with learning disabilities. The study concluded the simulation app were able to use by the students and get a statistically extremely significant difference in their academic performance.

Saludadez (2001) developed a learning package in research management. Specifically, she undertake the study to: (1) describe the development process of the Research Management learning packages; (2) determine the effect of self-instruction with learning package on the knowledge level of learner; (3) test the relationship between the knowledge level of learners after self-instruction with package in their class level, academic field, sex, age, and prior knowledge on the subject matter. Data for the development process description were gathered through participant observation and triangulated with the process documentation report of an NGO (non-government organization), a video documentary produced by a communication institute, the NGO and RMC (Research Management Center, College, Laguna,

Philippines) and documents of RMC. To determine the effect of self-instruction with package on the knowledge level of learners, an experiment using pretest-posttest design was conducted with 79 undergraduate students and 18 graduate students of the University of the Philippines, Los Banos. Fortyseven undergraduate respondents were assigned to the undergraduate treatment group and 32 to the undergraduate control group. Nine graduate respondents were assigned to graduate treatment group and nine to the graduate control group. Frequencies, percentages, means, t-test for paired and for independent samples, chi square, and correlation tests were used to analyze data. The results of the process documentation revealed that the development process underwent two stages--design and prototype development and production and was completed in 21 months. Evaluation was seen to be a critical element in the product development. It was revealed that the self-learning package is effective in enhancing the knowledge level of the students.

Bongala (2017) developed a learning module in teaching Junior Entrepreneurship for High School for her study. The descriptive-development-evaluative method of research was employed in the study. The developed learning module was evaluated in terms of its design, objectives, content features and consistency of expected outcomes. The study formulated conclusions based on its findings. First, the developed learning module followed a logical, sequential manner, guiding the Grade 7 and 8 TLE students through contents and assessment that they should learn in Entrepreneurship. Second, the developed learning module was excellently acceptable that it can be used as an instructional material in teaching Entrepreneurship. Third, the researcher integrated the comments, suggestions and recommendations given by the evaluators in enhancing the acceptability and usefulness of the learning module that was developed. Based from the findings and conclusions, the researcher recommended that further innovations and modifications can be done or made especially to the activities that can be found in the module. In addition, the developed learning module can be utilized as an instructional material in teaching Entrepreneurship to Grade 7 and 8 students as part of the 8 mini courses in TLE that should be taken during the said year level and lastly, the developed module is still open for further development and enhancement. Changes or development that will be applied should focus on how it can further enhance its use for increasing learning. Thus, its functionality can be enriched.

Magulod Jr. (2017) in his study, developed and evaluated a multisensory instructional material package for elementary learners. Three factors were evaluated in the package: acceptability, usefulness and appropriateness. The design and development research method were employed in the study. In evaluating the learning materials, the descriptive-comparative method was used. Forty-seven (47) student teachers and twenty (20) public elementary school teachers were the evaluators of the study. There were sixteen (16) multisensory instructional materials constructed, which can be used in all the subject areas of elementary curriculum. The results of the study revealed that the developed multisensory instructional materials were acceptable, useful and appropriate to be used in the elementary classroom. Moreover, test of difference showed that teacher-evaluators perceived higher evaluation on the usefulness of the materials than the student-teacher respondents.

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Synthesis of the State-of-the-Art

There are few studies along learning packages that prove similar within the frame of the current investigation. The present study is quite similar to the studies of Alaba and Tayo, Sawangsri and Murtafia et.al in its objective of creating a learning package that can eventually help students to learn how to learn. It differs however because the three mentioned studies also focused on building students' character or changing students' attitude. Moreover, the present study mainly focused on developing an instructional learning package that will lead students to master the core competencies of Computer Systems Servicing.

Development of computer-assisted/multimedia-aided learning packages are the focus of the studies conducted by Kumar and Kaor, Gunn and Pitt and Chuthapisith which are quite related to the present study. Though the present study is also computer-assisted/multimedia-aided, it will not use website as its platform and any programming software as compare to the previously mentioned studies. The learning package to be developed will be composed of booklets, CD containing tutorial videos and soft copy of the booklet that can be viewed by the students in a computer, tablet or even in cellphone.

Development of learning packages related to science and mathematics are the focused of the studies conducted by Taurista et.al., Affilianto, Ardinez, Ramirez and Aguilar et.al which aims to enhance students' skills in the subjects. It is quite related because of the fact that the instructional learning package to be developed in the present study will hone students' skills in the core competencies of Computer Systems Servicing.

The studies conducted by Ventayen and Nuestro focused on Computer Systems Servicing which are also similar to the present study. However, Ventayen's study mainly focused on finding out the level of competencies and expertise of primary and secondary ICT coordinators in Computer Systems Servicing while Nuestro developed an android-based simulation app in the same discipline. The present study is similar but, it will be dealing with creating an instructional learning package for the core competencies in Computer Systems Servicing which can be used by Junior High School Grade10 TLE-ICT-CSS students.

Magulod Jr. and the study of Saludadez, Jr. is quite akin to the present study in the manner that both are focused on developing a learning package. However, the scope of the first study is intended for elementary and the second one is for tertiary making it different to the present study for the reason that it is focused in Junior High School.

These studies have all contributed in giving this research the information needed for his investigation. The present study differs from these studies in terms of scope and delimitation which focuses on developing an instructional learning package for the core competencies in Computer Systems Servicing.

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Theoretical Framework

This study is anchored on Developmental Research Theory, Gagne's Instructional Design Theory and Instructional Technology Theory. Figure 1 which is found next page presents the paradigm of these theories used.

Developmental Research Theory consists of exploratory activities that a business chooses to conduct with the intention of making a discovery that can either lead to the development of new products or procedures, or to improvement of existing products or procedures. Research and development is one of the means by which business or institutions can experience future growth by developing new products or processes to improve and expand their operations. (Zulueta, 2004).

Gagne's work has been particularly influential in training and the design of instructional materials. In fact, the idea that instruction can be systematically designed probably can be attributed to Gagne and a handful of others. Gagne's theory is more properly classified as instructional design theory which seeks to describe the conditions under which one can intentionally arrange for the learning of specific performance outcomes.

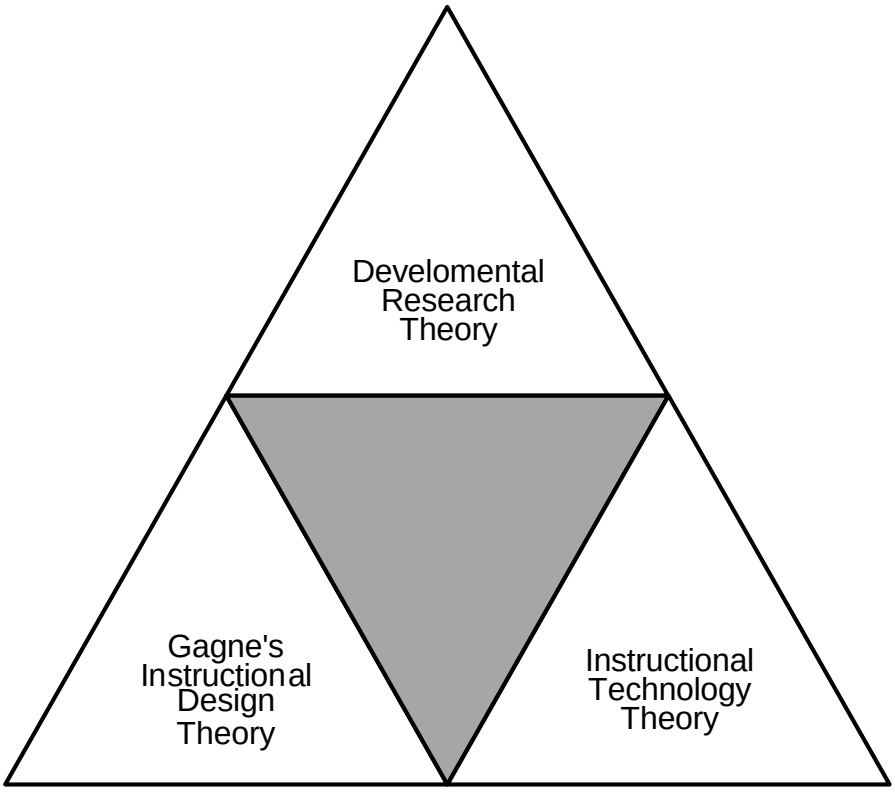

Figure 1
Theoretical Paradigm

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Gagne's Instructional Design Theory has three major elements. First, it is based on a taxonomy, or classification, of learning outcomes. Second, it proposes particular internal and external conditions necessary for achieving these learning outcomes. And third, it offers nine events of instruction, which serve as a template for developing and delivering a unit of instruction. (https://www/itma.vt.edu)

Instructional technology is a theory that focuses on practice and design, development, utilization, management, and evaluation of processes and resources that is necessary for learning. (Whelan, 2015)

Having these different theories, the researcher theorizes that students can utilize a certain instructional learning package/material not regarded as the subject of learning but as means of enhancing learning a subject matter. In this model of teaching, the classroom is seen as a community of learners engaged in activity, discourse and reflection. The instructional learning package for core competencies in Computer Systems Servicing give the learners the opportunity for concrete and contextually meaningful experience through which they can search for pattern, raise their own question and their own models, concepts and strategies thus, making them independent.

Conceptual Framework

The conceptual framework of this study is based on the systems approach which is composed of the three elements namely: the input, the process and the output. The input is the load of the system. It includes the initial performance assessment of Grade 10 TLE-ICT students of Sta. Elena Cluster in Computer Systems Servicing as revealed in the TESDA self-assessment guide and the CSS core competencies to be integrated in the instructional learning package.

The process is composed of development of the instructional learning package, evaluation of the instructional learning package using the LRMDS checklist/tool, analyzing and interpreting of data and information gathered and formulating conclusions and recommendations.

The output is the expected result of the study upon the assessment by the respondents on the subject matter. In this study, an instructional learning package for core competencies in Computer Systems Servicing serves as the output.

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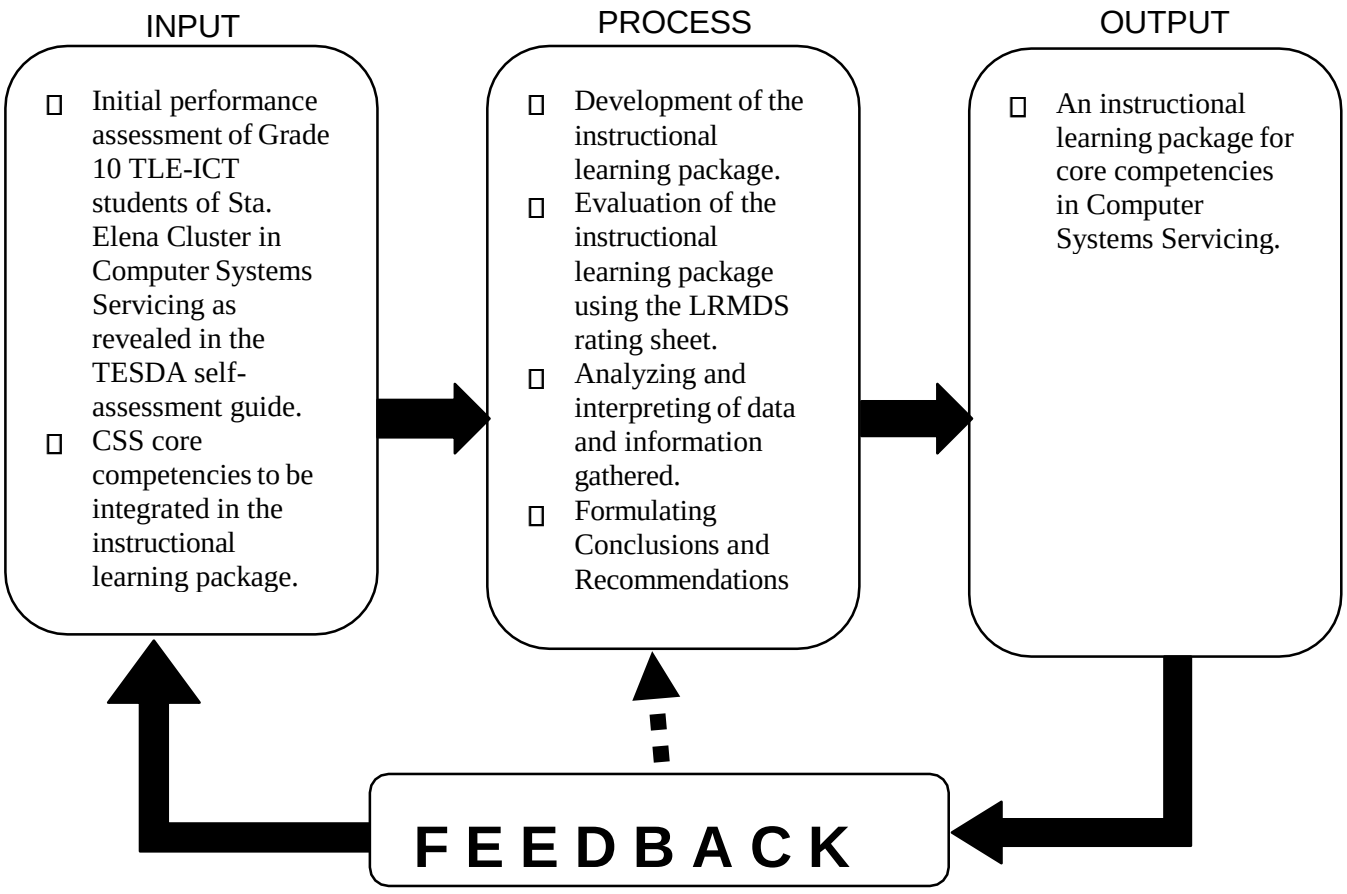

Figure 2
Theoretical Paradigm

METHODOLOGY

Research Methodology

This study used the descriptive-developmental-evaluative method of research. This method was used in describing, designing, developing and evaluating instructional programs, processes, products and innovations that need to meet the criteria of internal consistency and effectiveness (Richey, 2008). This method was utilized as this study aimed to develop an instructional learning package for core competencies in Computer Systems Servicing.

Developmental research was applied in this study to deal with the development and production of instructional learning package in teaching the core competencies in Computer Systems Servicing. Evaluative research on the other hand was employed at the course of evaluating the output of the study by

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the evaluators. The researcher also asked for recommendations or suggestions for the developed instructional learning package so that it can be further enhanced.

Sources of Data

The participation of the respondents was very vital to the attainment of the validity and reliability of the data to support the objectives of this study. In this research, the respondents who participated in the data gathering processes were the 75 Grade 10 TLE-ICT-CSS students and 2 selected TLE-ICT-CSS teachers from secondary public schools in Sta. Elena, Camarines Norte. They also include 1 Education Program Supervisor of TLE, 1 LRMDS Supervisor, and 2 TESDA Assessors of CSS in Camarines Norte.

Research Instrument

There were four instruments used in gathering the data and information needed to meet the output of this study. These were the TESDA self-assessment guide, DepEd Curriculum Guide in CSS and the Learning Resource Management and Development System (LRMDS) evaluation rating sheet. By means of these, the instructional learning package for core competencies in Computer Systems Servicing was designed and evaluated.

TESDA Self-Assessment Guide. This instrument was used to determine the initial performance level of the Grade 10 TLE-ICT-CSS students who were included in the study. This was also used to determine what instructional learning package can be developed and what core competencies can be integrated in the said instructional learning package.

DepEd Curriculum Guide in CSS. This instrument was also used to determine what instructional learning package can be developed and what core competencies can be integrated in the said learning package aligned to the core competencies that are being assessed by TESDA.

LRMDS Evaluation Rating Sheet. This instrument was used by the researcher to gather the evaluation of the evaluators in the developed instructional learning package for core competencies in CSS. The developed instructional learning package was composed of print and non-print materials. The print materials were evaluated as to the four factors: (1) content, (2) format, (3) presentation and (4) organization and accuracy and up-to-datedness of information. The non-print materials, on the other hand, were evaluated as to: (1) content quality, (2) instructional quality, (3) technical quality and (4) other findings. The rating sheet also asked the evaluators to write their comments, suggestions and recommendations on the developed instructional learning package.

Interview Guide. This instrument was used by the researcher to know the perception of the students on the result of their self-assessment in CSS.

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Data Gathering Procedure

The researcher carried out series of steps in order to develop the instructional learning package and have it evaluated by the chosen respondents of the study. The researcher considered some ethical aspects prior to or during the conduct of the study. First, the researcher requested permission from the authorities before the conduct of the formal study including the Schools Division Superintendent, school heads of the selected school locales and the selected participants of this research. Upon the approval, the researcher determined the initial performance assessment of Grade 10 TLE-ICT-CSS students of Sta. Elena Cluster in the core competencies of Computer Systems Servicing. Afterwards, the researcher determined what core competencies can be integrated in the instructional learning package using the DepEd curriculum guide in CSS and TESDA Self-Assessment guide. The researcher ensured that the core competencies integrated in the instructional learning package were aligned to the competencies in the curriculum guide of DepEd and also adhere to the core competencies being assessed by TESDA. After the development of the instructional learning package, the researcher has it evaluated by the evaluators using the LRMDS evaluation rating sheet for print and non-print materials. After this, the researcher collated, tabulated, interpreted and analyzed the data to arrive at sound findings that determined the acceptability of the instructional learning package for core competencies in Computer Systems Servicing.

Statistical Treatment of Data

Descriptive statistics was utilized in this study. All the pertinent data gathered relevant to each subproblem of the study was treated, analyzed and interpreted using this statistical treatment. The descriptive statistics applied in this study made use of frequency count and summation. Frequency count is the measure of the number of times that an event or response occurs. In this study, frequency count and summation were used in determining the initial performance assessment of Grade 10-TLE-ICT-CSS students in Sta. Elena cluster. Summation on the other hand was used in determining the total points given by the evaluators in the developed instructional learning package to each factor evaluated in the LRMDS evaluation rating sheet and frequency count was also used to determine how many evaluators rated “Passed” or “Failed” in the developed instructional learning package in each factor evaluated.

RESULTS AND DISCUSSIONS

1. Initial performance assessment of the respondents in Computer Systems Servicing as revealed in the TESDA Self-Assessment Guide

Upon the approval to conduct the study, the researcher conducted an initial performance assessment using the TESDA Self-Assessment Guide (SAG) to the Grade 10 TLE-ICT-CSS students from E. P. Borja High School, San Pedro Domingo-Llarena High School and Bulala High School, the three selected schools in Sta. Elena Cluster offering CSS specialization in Junior High School for SY 2019-2020. The TESDA

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SAG is a pre-assessment tool to help the candidate and the assessor determine what evidence is available, where gaps exist, including readiness for assessment. It determines the students' confidence in performing the core competencies in CSS. The result of the initial performance assessment determined the percentage of Grade 10 TLE-ICT-CSS students in Sta. Elena Cluster who are confident and not confident in performing each critical aspect of the competencies in CSS.

Figure 3 showed the initial performance assessment of the student respondents in Certificate of Competency 1 (COC1) *Install and Configure Computer Systems*.

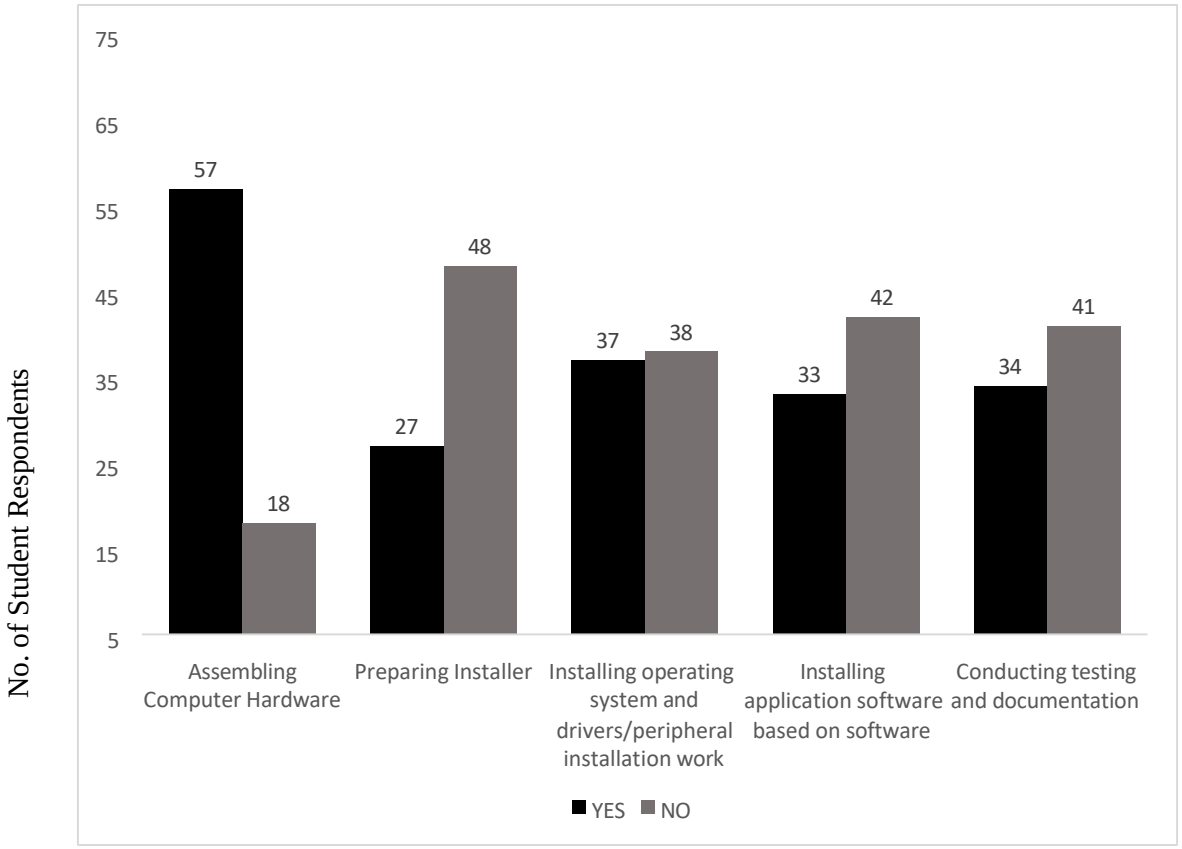

Figure 3. Initial Performance Assessment Result in COC1: Install and Configure Computer Systems

The results revealed that 57 out of 75 or 76% of the student respondents were confident enough to perform the competency *Assembling computer hardware* while 18 out of 75 or 24% were not. However, in the *Preparing installer* competency, there were only 27 out of 75 or 36% student respondents who answered yes while the remaining which is 48 out of 75 or 64% answered no. In *Installing operating system and drivers/peripheral installation work* competency, there were 37 out of 75 or 49% student respondents who answered yes, and 38 out of 75 or 51% answered no. Similarly, there were more student respondents who answered no in *Installing application software based on software* with 42 out of 75 or 56% while 33 out of 75 or 44% of the student respondents answered yes. Lastly, in *Conducting testing and documentation*

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competency there were 34 out of 75 or 45% who answered yes that they can confidently perform it while 41 out of 75 or 55% answered no.

Based on the data in Figure 3, it turned out that in COC1, the *Assembling computer hardware* was the competency that the student respondents can confidently perform the most while *Preparing installer* was the competency tallied the least.

Figure 4 showed the initial performance assessment of the student respondents in Certificate of Competency 2 (COC2) *Set-up Computer Networks.*

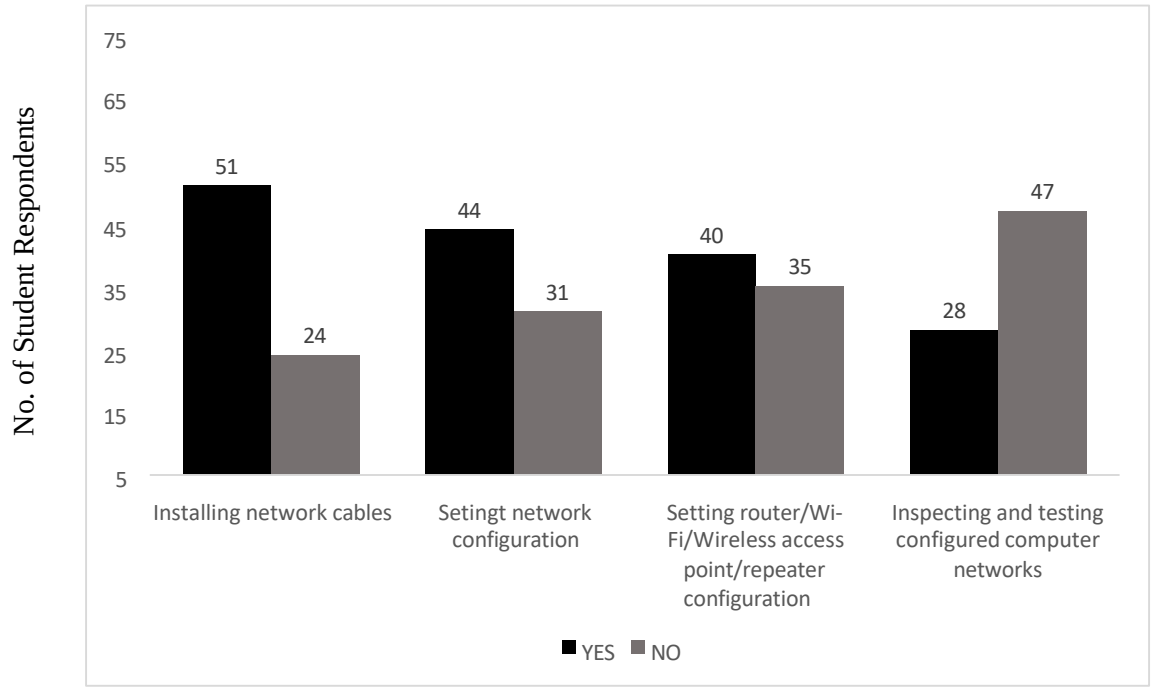

Figure 4. Initial Performance Assessment Result in COC2: Set-up Computer Networks

This information stated that 51 out of 75 or 68% of the student respondents were confident enough to perform the competency *Installing network cables* and 24 out of 75 or 32% were not. Similarly, there were more students who answered yes in *Setting network configuration* competency with 44 out of 75 or 59% while 31 out of 75 or 41% of the student respondents answered no. In *Setting router/Wi-Fi/Wireless access point/repeater configuration* competency on the other hand, there were 40 out of 75 or 53% student respondents who answered yes, and 35 out of 75 or 47% answered no. Lastly, in *Inspecting and testing configured computer networks* competency, 28 out of 75 or 37% of the student respondents answered yes and the remaining 63% answered no.

Based on the data in Figure 4, it turned out that in COC2, the *Installing network cables* was the competency that the student respondents can confidently perform the most while *Inspecting and testing*

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configured computer networks was the competency that most of them cannot perform confidently. Figure 5, on the other hand, showed the initial performance assessment of the student respondents in Certificate of Competency 3 (COC3) *Set-up Computer Server*.

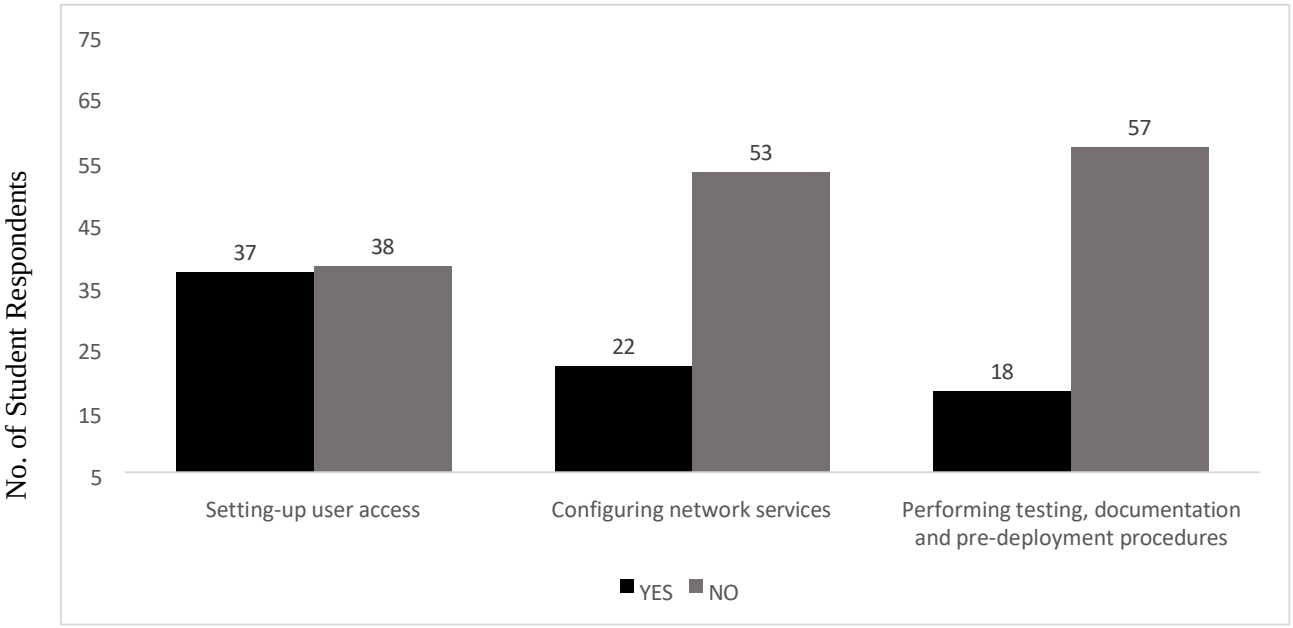

Figure 5. Initial Performance Assessment Result in COC3: Set-up Computer Servers

This data showed that 37 out of 75 or 49% of the student respondents were confident enough to perform the competency *Setting-up user access* and 38 out of 75 or 51% were not. Similarly, there were more students who answered no in the *Configuring network services* competency with 53 out of 75 or 71% while 22 out of 75 or 29% answered yes. Lastly, there were also more students who answered no in *Performing testing, documentation and pre-deployment procedures* competency 57 out of 75 or 76% while there were only 18 out of 75 or 24% of the student respondents answered yes.

Based on the data in Figure 5, it turned out that among the competencies in COC3, the *Setting-up user access* was the competency that the student respondents can confidently perform the most while *Performing testing, documentation and pre-deployment procedures* was the competency that most of the students cannot perform confidently.

Lastly, Figure 6 showed the initial performance assessment of the student respondents in Certificate of Competency 4 (COC4) *Maintain and Repair Computer Systems and Networks.*

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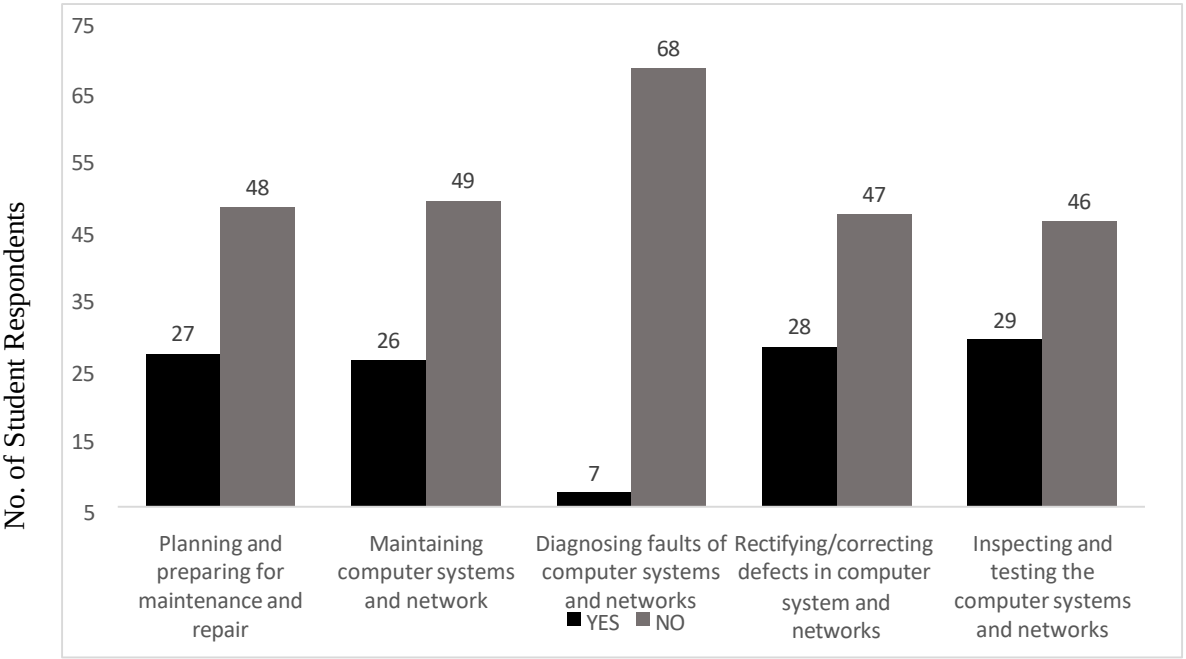

Figure 6. Initial Performance Assessment Result in COC4: Maintain and Repair Computer Systems and Networks

This revealed that 27 out of 75 or 36% of the student respondents were confident enough to perform the competency *Planning and preparing for maintenance and repair* and 48 out of 75 or 64% were not. Similarly, there were more students who answered yes in the *Maintaining computer systems and network* competency with 49 out of 75 or 65% while 26 out of 75 or 35% answered no. In *Diagnosing faults of computer systems and networks* competency, there were only 7 out of 75 or 9% student respondents who answered yes, and 68 out of 75 or 91% answered no. In *Rectifying/correcting defects in computer system and networks* competency, on the other hand, there were 28 out of 75 or 37% student respondents who answered yes while 47 out of 75 or 63% answered no. Lastly, in *Inspecting and testing the computer systems and networks* competency there were 29 out of 75 or 39% who answered yes that they can confidently perform it while 46 out of 75 or 61% answered no.

Based on the data in Figure 6, it turned out that in COC4, the *Inspecting and testing the computer systems and networks* was the competency that the student respondents can confidently perform the most while *Diagnosing faults of computer systems and networks* was the competency that most of them cannot perform confidently.

Students should respond yes in all the competencies stated in each Certificate of Competency (COC) in order to possibly pass the assessment and earn the National Certificate II on Computer Systems Servicing, according to the TESDA Assessment Guide. Figure 7 below showed the initial performance assessment in each COC of Computer Systems Servicing. This graph shows how many of the student respondents passed and failed each COC based on their responses in the self-assessment guide.

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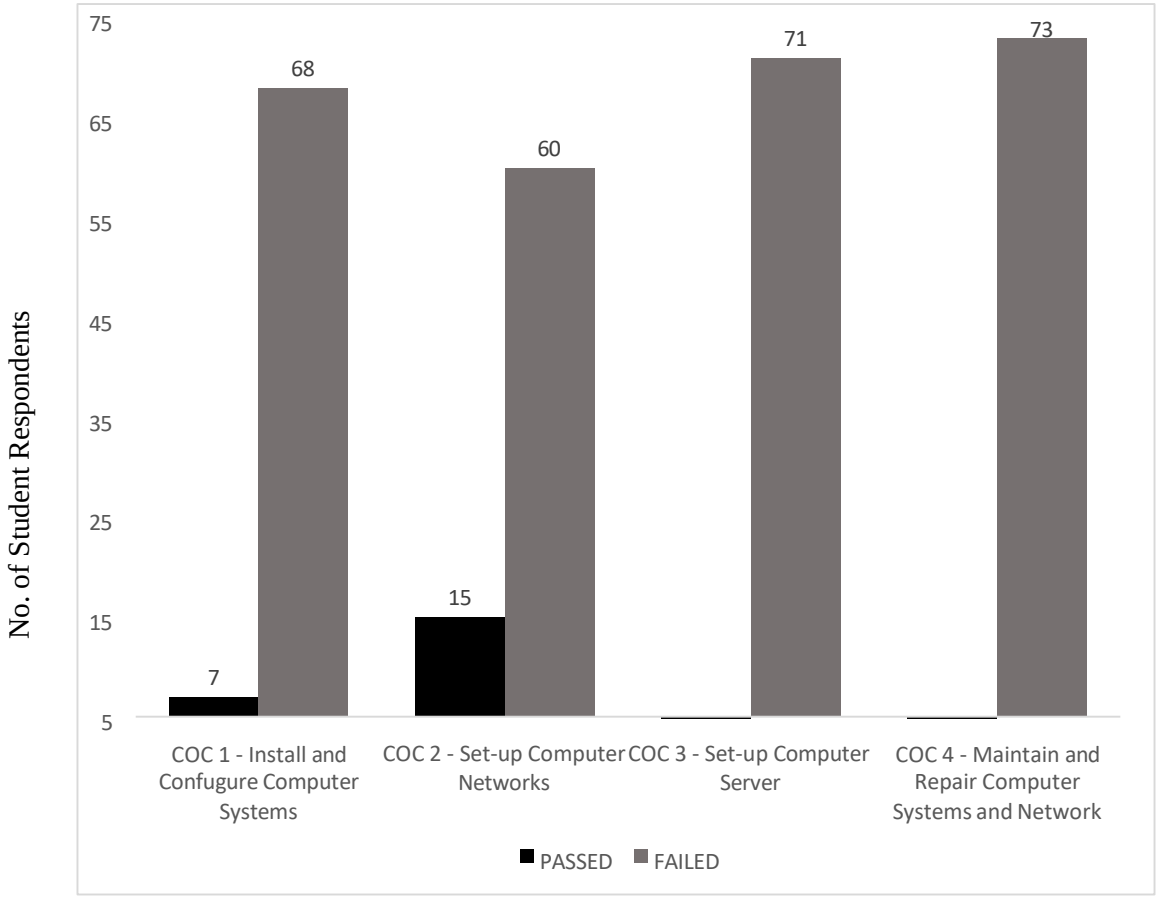

Figure 7. Initial Performance Assessment Result in each COC of Computer Systems Servicing based from responses in TESDA Self-Assessment Guide

This revealed that there were only 7 out of 75 or 9% of the student respondents can possibly pass COC 1, 15 out of 75 or 20% can possibly pass COC 2, 4 out of 75 or 5% in COC 3 and 2 out of 75 or 3% in COC 4.

Students must pass all the COCs to possibly earn a National Certificate II in Computer Systems Servicing. Figure 8 below showed the overall result of the initial performance assessment in Computer Systems Servicing. It showed the number of students who can possibly pass and earn a National Certificate II in Computer Systems Servicing based on the result of their responses in the self-assessment guide.

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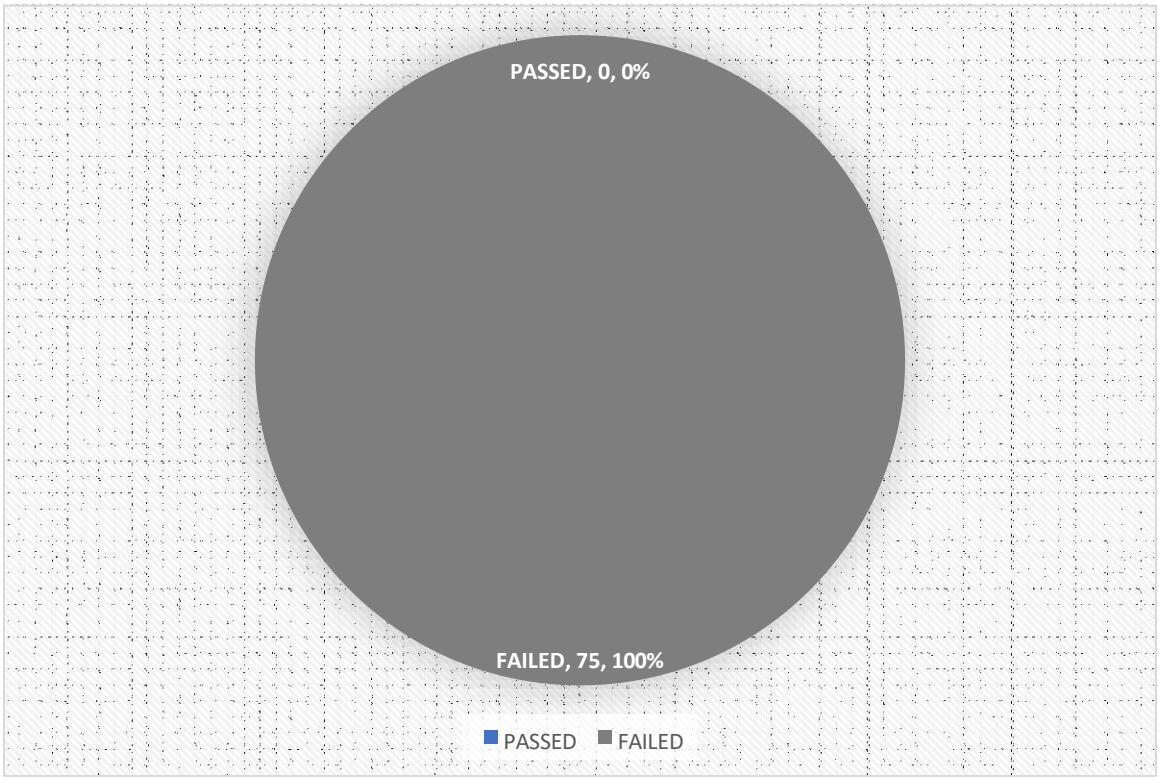

Figure 8. Overall Result of the Initial Performance Assessment in Computer Systems Servicing based from the result of responses in TESDA Self-Assessment Guide

This revealed that none of the Grade 10 TLE-ICT-CSS students in Sta. Elena Cluster could possibly pass the assessment for National Certificate II in Computer Systems Servicing based on the result of their responses in the TESDA Self- Assessment Guide.

According to the Section 4.1 of the TESDA Training Regulation (TR) – Electronics Sector, to attain the National Qualification of CSS NC II, the candidate must demonstrate competence in all units of competencies and successful candidates shall be awarded a National Certificate signed by the TESDA Director General. Moreover, Section 4.2.1 states that the qualification of CSS NC II may be attained through the accumulation of COCs in all the following units of competencies: 4.2.1.1 Install and configure computer systems; 4.2.1.2 Set-up computer networks; 4.2.1.3 Set-up computer servers; and 4.2.1.4 Maintain and Repair Computer Systems and Networks. Added to these, successful candidates shall be awarded a COC in each of the core units. Upon accumulation and submission of all COCs acquired for the relevant units of competency comprising a qualification, an individual shall be issued the corresponding National Certificate. It is also stated in the Section 4.4 of the TESDA TR, that assessment shall focus on the core units of competency. The basic and common units, on the other hand, shall be integrated or assessed

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concurrently with the core units. Hence, students must focus more on mastering the core units of competency in CSS in order to pass the TESDA assessment.

The researcher came up with an interview to know the perception of some students on why they failed the self-assessment or why they were not confident in performing some of the competencies in CSS.

In an interview with Student A, a Grade 10 TLE-ICT-CSS student of Bulala High School, he said, *"Hindi po ako ganun ka confident kase may mga competencies na nakalimutan ko na. Yung notes ko po hindi sapat. Wala po kase kaming updated na module para maview iyong mga dapat balikan. May mga topic rin po na siguro ngayong 4th quarter sa amin ididiscuss. Tsaka kulang din po kami sa facilities and equipment na mahalaga po para ma achieve namin yung ibang competencies."* (I am not that confident because there are competencies that I forgot already. My notes are not enough. We do not have updated module to review some competencies. There are also topics that perhaps will be discussed to us this 4th quarter. Also, we don't have sufficient facilities and equipment that are important to achieve the other competencies.

Plate 1. **A Photo Showing the Researcher and the Two Grade 10 TLE-ICT-CSS students of Bulala High School during the Interview**

Likewise, another interviewee, Student B, also a Grade 10 TLE-ICT-CSS student of Bulala HS, who said, *"Ngayong 4th quarter pa po kasi ata itututuro yung ibang lessons kaya hindi ko pa alam yung ibang competencies. Kulang rin po kase sa facilities. Nakalimutan ko na rin po yung ibang topics. Kung merun lang po sanang module na may pictures nung bawat processes, madali ko siyang maaalala."* (Other lessons will be taught this 4th quarter that's why I don't know it yet. Also, facilities are not enough. I already forgot some of the topics. If only there's a module with pictures of each processes, it will be easier for me to remember it.)

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The researcher also interviewed students from E.P. Borja High School. Student C, a Grade 10 TLEICT-CSS student, mentioned *"Dahil po sa kakulangan ng aking nalalaman at dahil po nakakatakot na mag-explore sa mga bagay-bagay dahil baka po magkamali. At dahil din po hindi po ako masyadong aware sa ganong mga bagay kaya wala po akong masyadong confident sa ilang mga competencies."* (It's because I have insufficient knowledge and I'm afraid to explore things because I think I will make a mistake. I am also not that aware in those things that's why I don't have confidence in some of the competencies.)

Likewise, Student D, also a Grade 10 TLE-ICT-CSS student, said *"Dahil sa kakulangan ng aking kaalaman tungkol dito. Dahil hindi masyadong natututukan ang mga bagay na iyon dito sa school at isa pa po takot akong gumalaw ng kung anu-ano sa bagay na iyon."* (It's because of I have insufficient knowledge about it. It's because those things were not given focus here in school and another thing is, I'm afraid to manipulate those things.)

Plate 2. **A Photo Showing the Researcher and the Two Grade 10 TLE-ICT-CSS students of E.P. Borja High School during the Interview**

The Grade 10-TLE-ICT-CSS students of San Pedro-Domingo Llarena High School were also interviewed by the researcher. Student E, said, *"Wala po akong masyadong kaalaman sa computer. Hindi po madali kapag computer ang pinag-uusapan. Maaaring makatulong po sa amin kung merung module na may pictures or videos ng mga processes para mas lalong lumawak ang aming kaalaman about computer."* (I don't have that much knowledge about computer. It's not easy when computer is the subject matter. It may be helpful to us if there is module with pictures or videos of the processes for us to have broader knowledge about computer.)

Another interviewee, Student F, mentioned, *"Wala po kasi akong masyadong kaalaman sa computer. Kulang rin po ang mga gamit sa computer at mga guro. Kailangan ng mga maraming aklat*

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tungkol sa computer nang sa gayon ay maraming tumangkilik sa pag-aaral ng computer." (I don't have that much knowledge about computer. There are also insufficient computer facilities and teachers. More books about computer are needed so that many students will be encouraged to enroll in computer studies.)

Plate 3. **A Photo Showing the Researcher and the Two Grade 10 TLE-ICT-CSS students of San Pedro Domingo-Llarena High School during the Interview**

2. Instructional Learning Package developed for Core Competencies in Computer Systems Servicing

An instructional learning package for core competencies in Computer Systems Servicing (CSS) was developed by the researcher which aims to hone the ability of the students about the CSS as their specialization independently. Added to this, the researcher addressed the call to improve the quality of instructional materials for use inside the classrooms in the school. The instructional learning package is entitled "THE CORE" which focuses on the four core competencies of CSS. The package consists of print and non-print resources. Print resources include four modules and a teacher's guide. Non-print resources, on the other hand, include a Compact Disc (CD) which contains interactive PowerPoint presentations and consolidated instructional videos. Plate 4 below shows the front cover and the introductory page of the first module in the package entitled *Installing and Configuring Computer Systems.*

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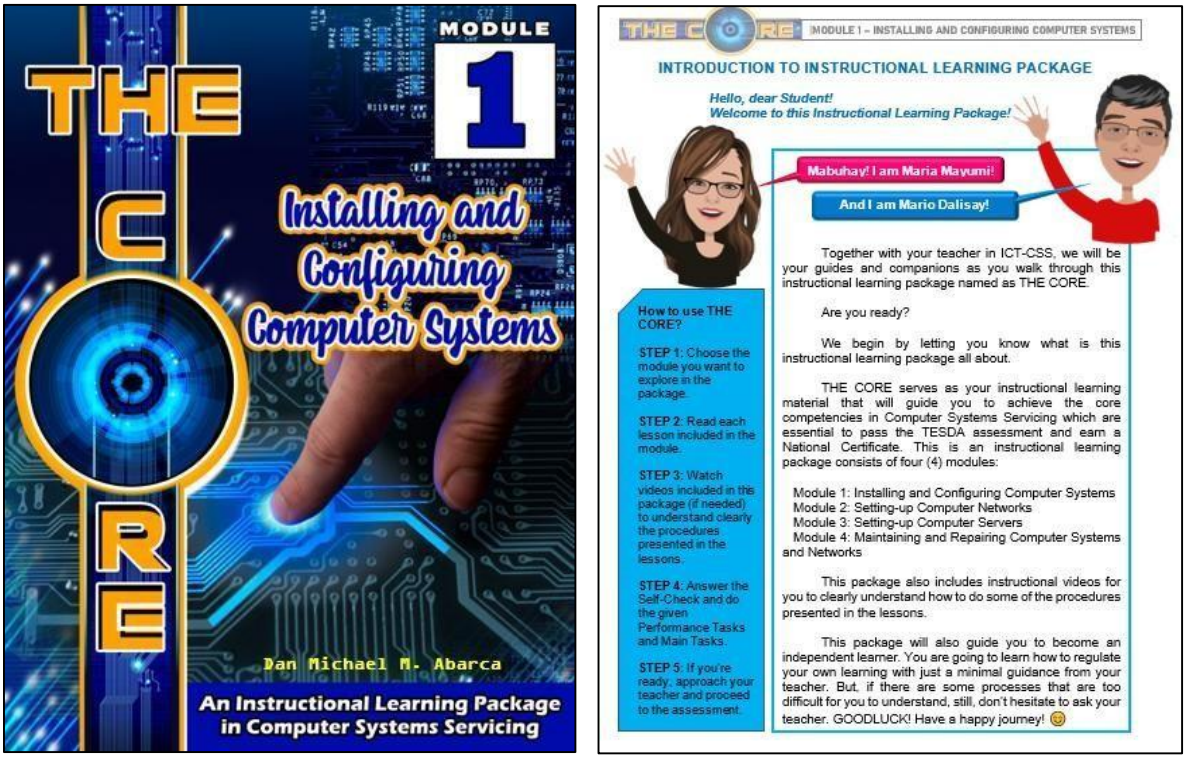

Plate 4. **The Front Cover and Introductory Page of the First Module in the Developed Instructional Learning Package in Computer Systems Servicing**

The first module that was developed has 132 pages of colorful printouts. It also consists of five learning outcomes which each contains different lessons with specific objectives parallel with the competencies that can be found in the CSS curriculum guide for Grades 9 to 12. This includes lesson readings, self – checks, performance tasks, main tasks and Watch and Learn for each lesson of these five learning outcomes.

Plate 5 below shows the front cover and introductory page of the second module in the package entitled *Setting-up Computer Networks.*

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Plate 5. **The Front Cover and Introductory Page of the Second Module in the Developed Instructional Learning Package in Computer Systems Servicing**

The second module has 110 pages of colorful printouts. It also consists four (4) learning outcomes which each contains different lessons with specific objectives parallel with the competencies that can be found in the CSS curriculum guide. This includes lesson readings, self – checks, performance tasks, main tasks and Watch and Learn for each lesson of these four learning outcomes.

Plate 6 on the other hand, showed the front cover and introductory page of the third module in the package entitled *Setting-up Computer Server*.

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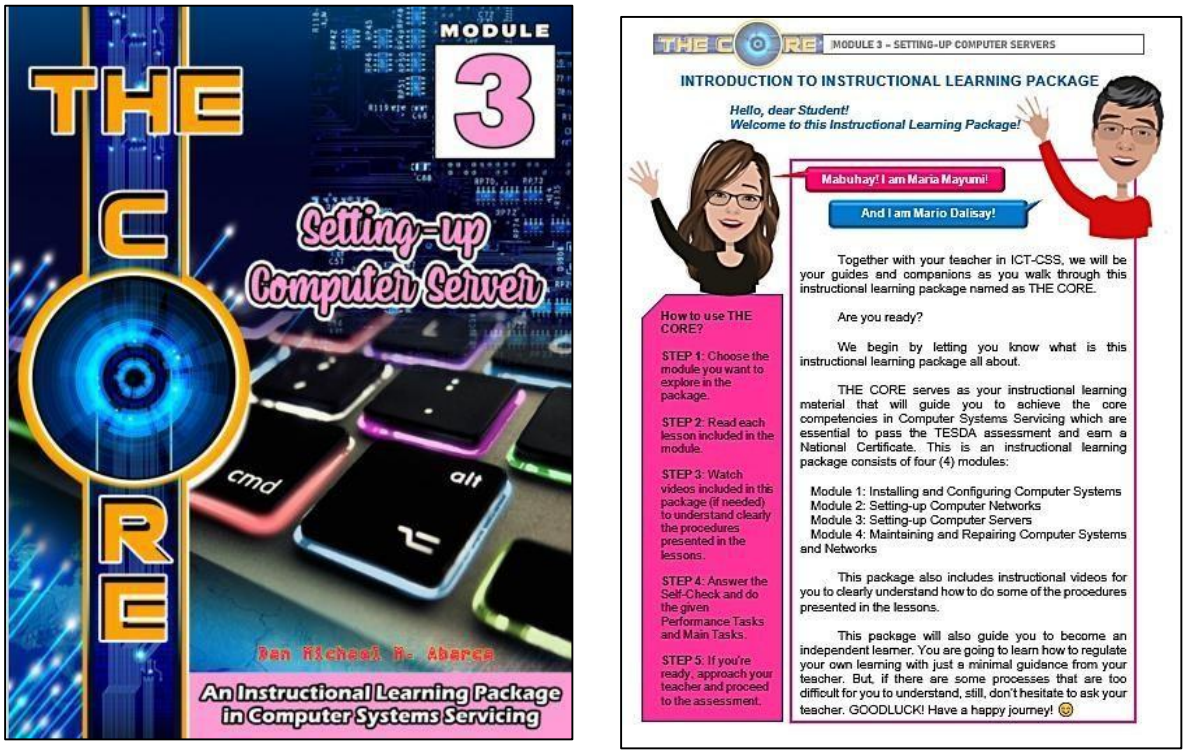

Plate 6. **The Front Cover and Introductory Page of the Third Module in the Developed Instructional Learning Package in Computer Systems Servicing**

The third module has 120 pages of colorful printouts. It consists three learning outcomes which contains different lessons with specific objectives parallel with the competencies that can be found in the CSS curriculum guide. This includes lesson readings, self – checks, performance tasks, main tasks and Watch and Learn for each lesson of these three learning outcomes.

Plate 7 below showed the front cover and introductory page of the fourth module in the package entitled *Maintaining and Repairing Computer Systems and Networks.* It has 141 pages of colorful printouts. It consists five learning outcomes, which contains different lessons with specific objectives parallel with the competencies that were found in the CSS curriculum guide. This includes lesson readings, self – checks, performance tasks, main tasks and Watch and Learn for each lesson of these five learning outcomes.

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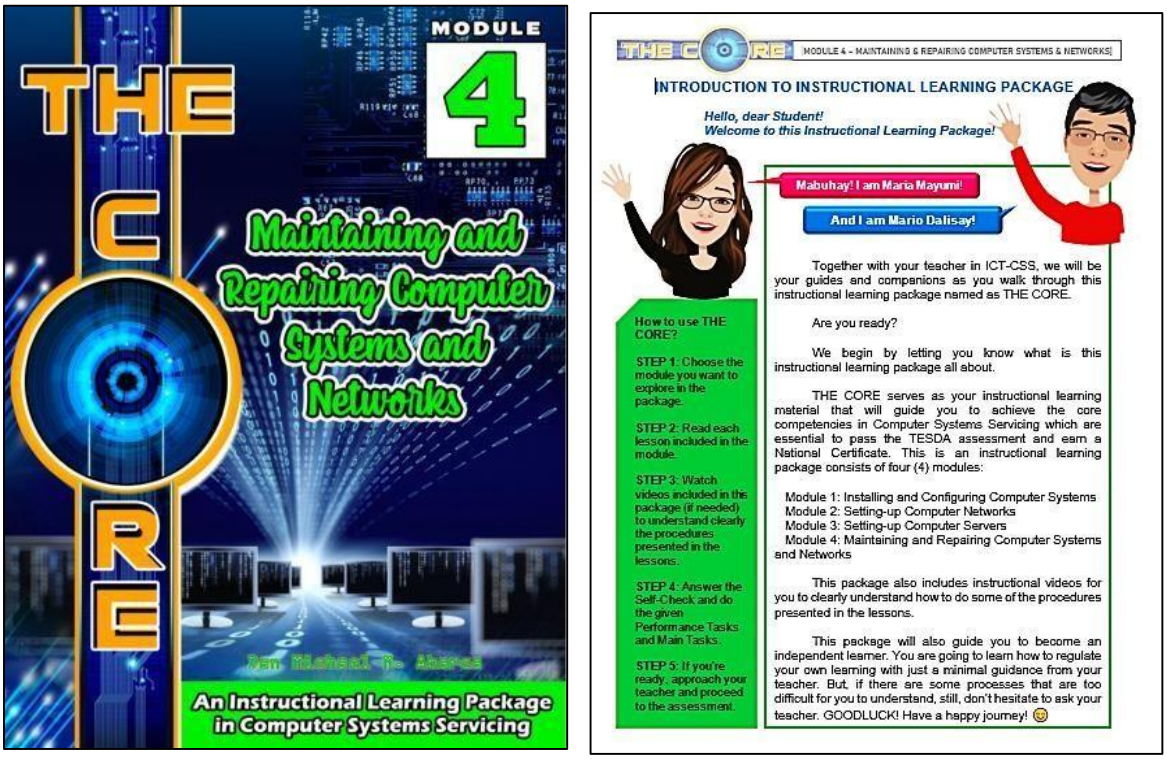

Plate 7. **The Front Cover and Introductory Page of the Fourth Module in the Developed Instructional Learning Package in Computer Systems Servicing**

The teacher's guide, on the other hand, consists session plans, summative assessments with Table of Specification (TOS) and step-by-step guide on how to use Flip Grid and Microsoft Forms. Plate 8 showed the front cover of the teacher's guide in the developed instructional learning package in CSS.

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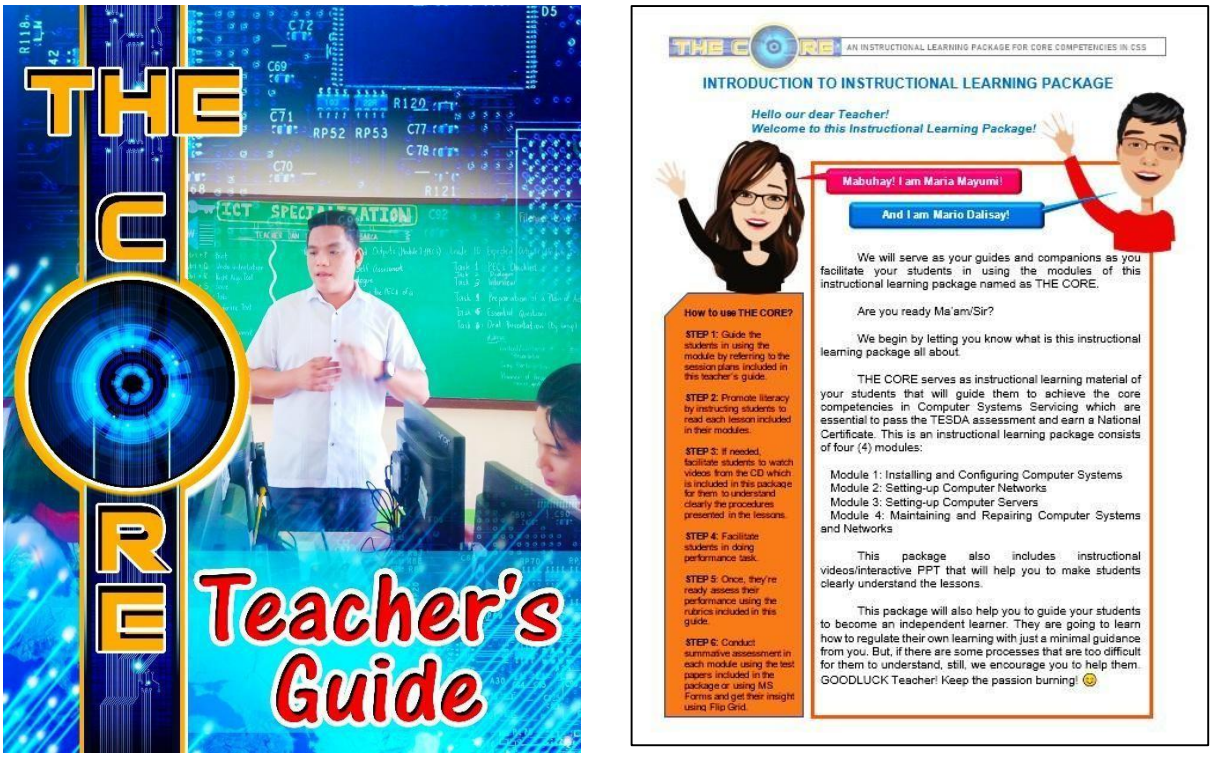

Plate 8. **The Front Cover and Introductory Page of the Teacher's Guide in the Developed Instructional Learning Package in Computer Systems Servicing**

Plate 9 below showed the sample screenshots of one of the interactive PowerPoint presentations included in the CD of instructional learning package.

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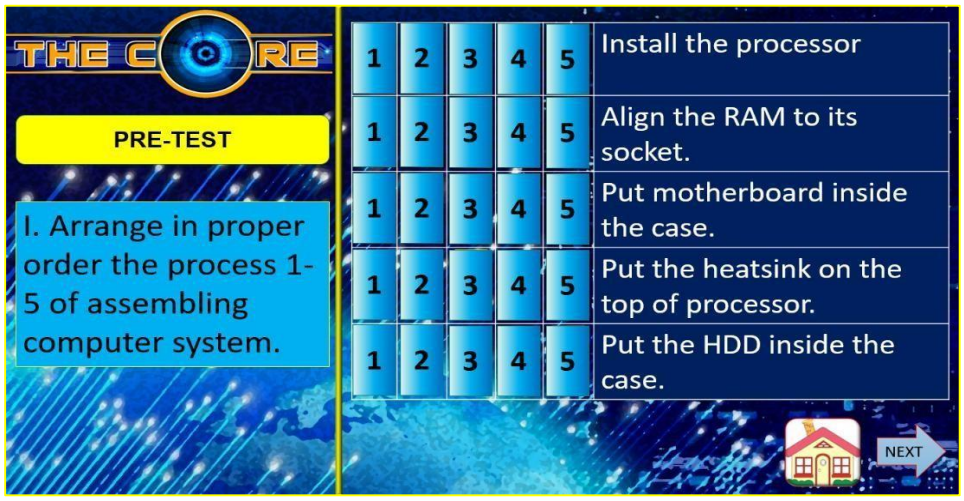

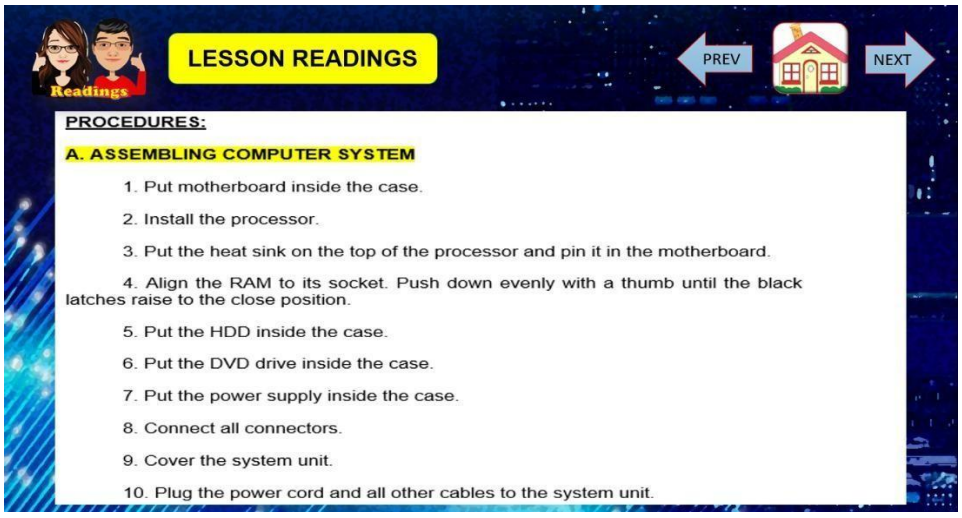

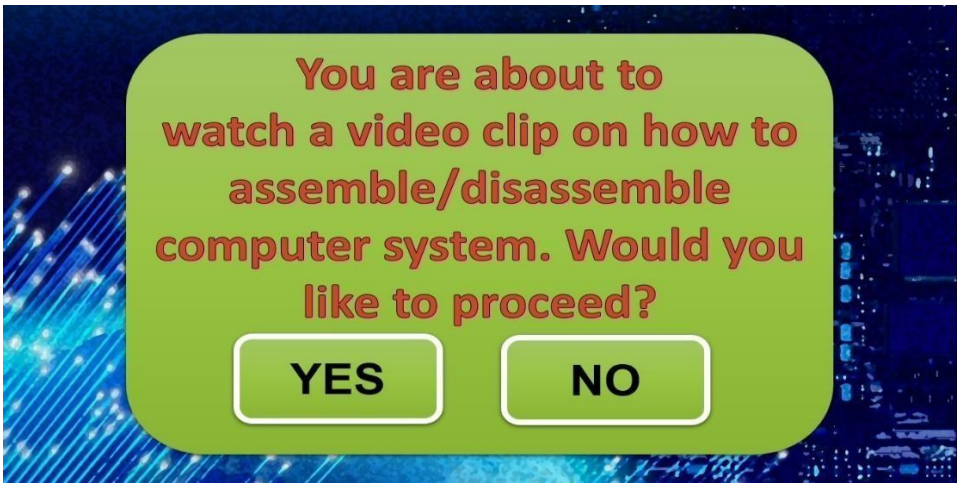

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Plate 9. **The Sample Screenshots from one of the interactive PowerPoint Presentations included in the CD of the Developed Instructional Learning Package in CSS**

The six screenshots in Plate 9 above were from the interactive PowerPoint presentation for the lesson *Computer Assembly and Disassembly Procedures*. Students can interact with the buttons with hyperlinks to view the objectives of the lesson, answer the pre-test/posttest, read contents of the lesson, watch a video clip related to the lesson and view the lesson references.

Plate 10 below showed the screenshots of the PowerPoint-based consolidated videos for Module 1 to Module 4.

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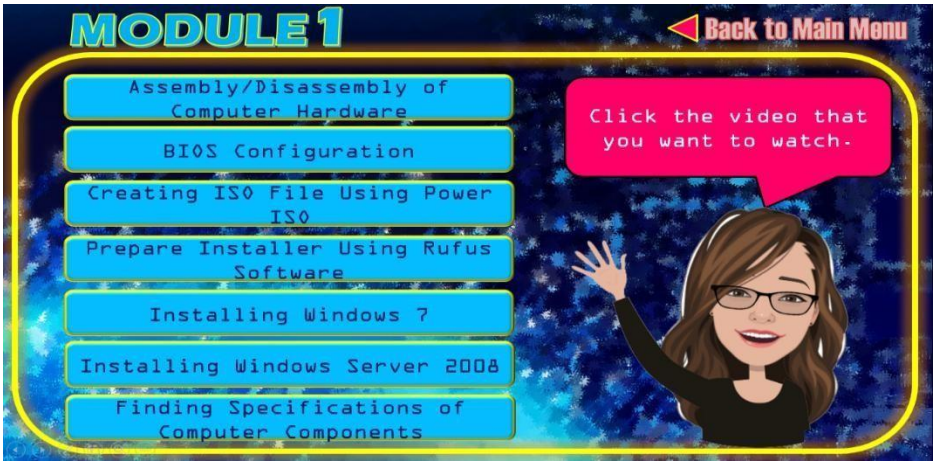

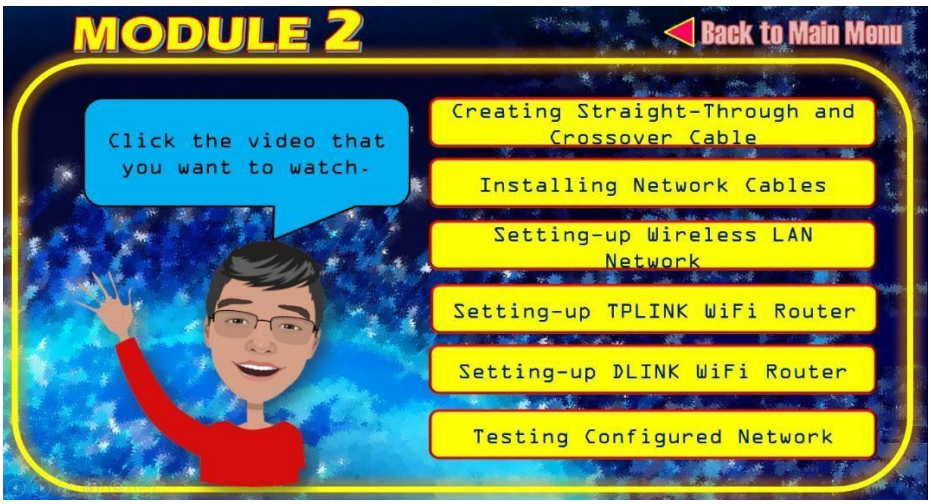

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Plate 10. **The Screenshots of PowerPoint-Based Consolidated Videos from Module 1 to 4 included in the CD of the Developed Instructional Learning Package in CSS**

The six screenshots in Plate 10 above were from the PowerPoint-based consolidated videos for Module 1 to Module 4. These can be access by the students when they are going to watch a video clip provided for a particular lesson in each module. These will help them to further understand the concepts and learn independently.

The non-print resource of the developed instructional learning package can run in a PC or laptop with minimum specifications of Intel Pentium, 1.6GHz processor, 4.00 GB memory capacity, 64-bit operating system (Windows 8/10) and 13" LCD Monitor. The interactive PowerPoint and consolidated instructional videos can only run in a PC / laptop with MS PowerPoint 2016 or more upgraded versions of MS Office installed.

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The developed instructional learning package for core competencies in computer systems servicing indicates that teachers in secondary schools, new or seasoned can be able to innovate and create an instructional learning package that they see suited to their learners. Added to this, creating an instructional learning package can be a big help in delivering the teaching-learning process. The developed instructional learning package affirmed what has been said about learning packages.

Miller (1990) said that self-learning packages are viable, cost effective methods of delivering instruction. According to Bell (1997) in her article entitled *Designing and using a learning package for teaching,* one of the benefits of learning package is the facilitation of autonomous and reflective learning. Nikolajski (2002) stated that time and resources constraints affect the teacher's ability to teach needed topics to large numbers of students. His study suggested that the use of self-learning packages can be a viable alternative or adjunct to traditional way of teaching.

3. Core Competencies Integrated in the Instructional Learning Package

There were four core competencies integrated in the developed instructional learning package in CSS. The core competencies were as follows: (1) Installing and configuring computer systems; (2) Settingup computer networks; (3) Setting-up computer server; and (4) Maintaining and repairing computer systems and networks. Each module in the package represents each core competency in CSS as reflected in its title. Each module consists content standard, performance standard and learning outcomes.

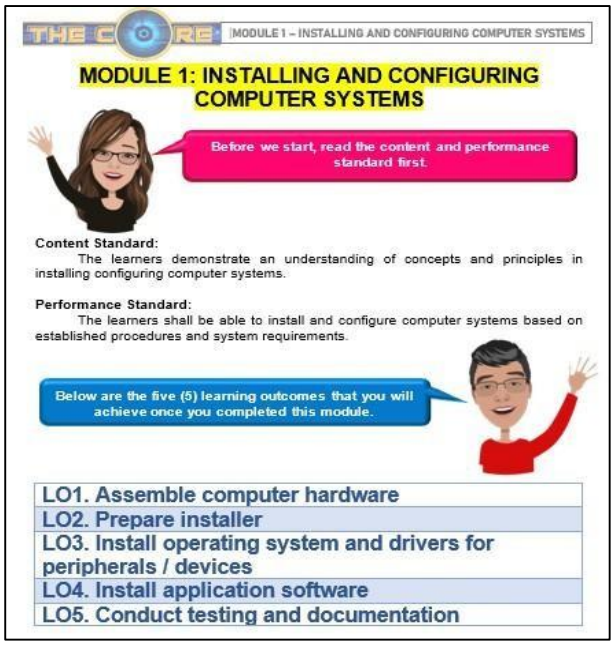

Plate 11. **The Core Competency Integrated in Module 1 of the Developed Instructional Learning Package Together with the Content/Performance Standard and Learning Outcomes**

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In Module 1 – Installing and Configuring Computer Systems, there were five learning outcomes. The five learning outcomes include LO1: Assemble computer hardware; LO2: Prepare installer; LO3: Install operating system and drivers for peripherals / devices; LO4: Install application software; and LO5: Conduct testing and documentation. Plate 11 above showed the core competency integrated in Module 1 of the developed instructional learning package together with the content standard, performance standard and learning outcomes.

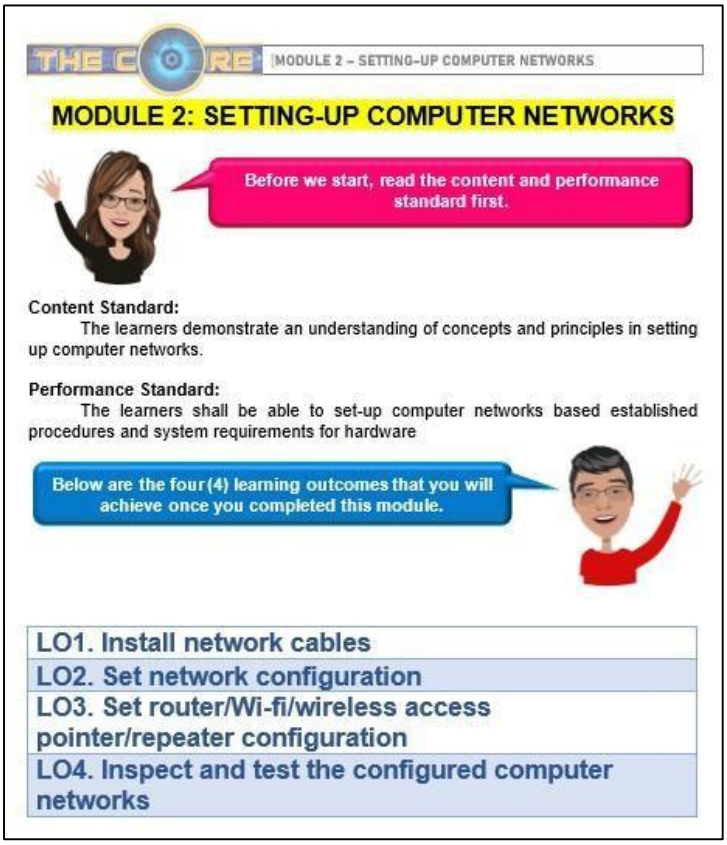

Plate 12. **The Core Competency Integrated in Module 2 of the Developed Instructional Learning Package Together with the Content/Performance Standard and Learning Outcomes**

In Module 2 – Setting-up Computer Networks, there were four learning outcomes: (1) Install network cables; (2) Set network configuration; (3) Set router/Wi-Fi/wireless access point/repeater configuration; and (4) Inspect and test configured computer networks. Plate 12 above shows the core competency integrated in Module 2 of the developed instructional learning package together with the content and performance standard and learning outcomes.

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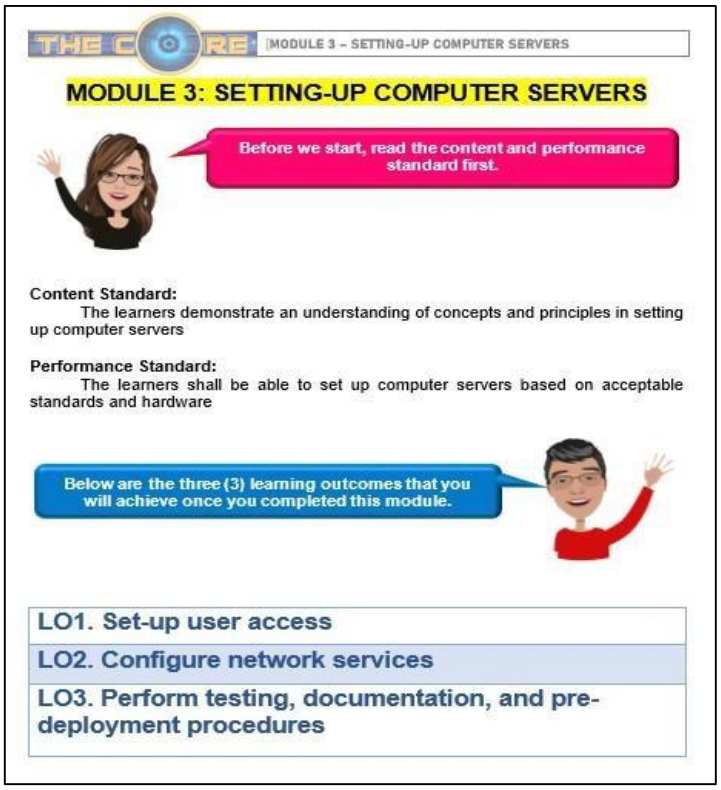

Plate 13. **The Core Competency Integrated in Module 3 of the Developed Instructional Learning Package Together with the Content/Performance Standard and Learning Outcomes**

In Module 3 – Setting-up Computer Server, there were three learning outcomes: (1) Set-up user access; (2) Configure network services; and (3) Perform testing, documentation, and pre-deployment procedures. Plate 13 shows the core competency integrated in Module 3 of the developed instructional learning package together with the content and performance standard and learning outcomes.

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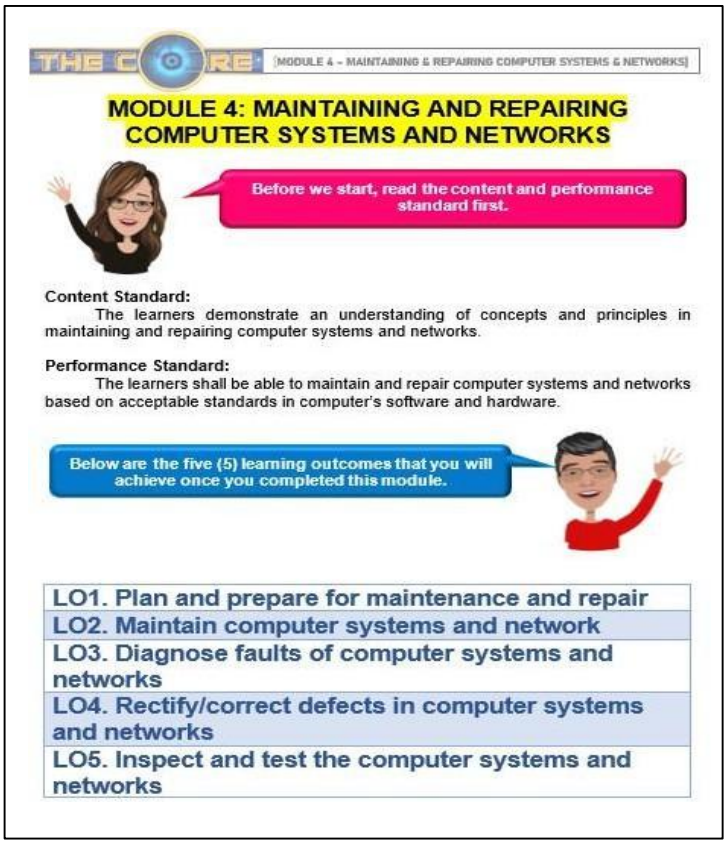

Plate 14. **The Core Competency Integrated in Module 4 of the Developed Instructional Learning Package Together with the Content/Performance Standard and Learning Outcomes**

Lastly, in Module 4 - Maintaining and repairing computer systems and networks, there were five learning outcomes. The five learning outcomes include (1) Plan and prepare for maintenance and repair; (2) Maintain computer systems and networks; (3) Diagnose faults of computer systems and networks; (4) Rectify/correct defects in computer systems and networks; and (5) Inspect and test the computer systems and networks. Plate 14 shows the core competency integrated in Module 4 of the developed instructional learning package together with the content and performance standard and learning outcomes.

Each learning outcome found in the four modules consists lessons with specific objectives which complemented the competencies provided in the CSS curriculum guide.

4. Evaluation of the Evaluators in the Developed Instructional Learning Package in Computer Systems Servicing

The developed instructional learning package in CSS was evaluated by the evaluators using the Learning Resource Management and Development System (LRMDS) evaluation rating sheet for print and

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non-print materials/resources. The evaluators include 75 selected Grade 10 TLE-ICT-CSS students from E. P. Borja High School, San Pedro Domingo-Llarena High School and Bulala High School and two TLEICT-CSS teachers in Sta. Elena Cluster, two TESDA assessors and one Education Program Supervisor (EPS) in TLE. Unfortunately, the LRMDS supervisor, due to the minute tasks assigned to her, was not able to evaluate the output.

In the LRMDS evaluation rating sheet for print resources, there were 4 factors evaluated: (1) Content; (2) Format; (3) Presentation and Organization and (4) Accuracy and up-to-datedness of Information. In each factor, there were several indicators. In Factor 1: Content, there were 7 indicators rated by the evaluators, in Factor 2: Format, there were 4 with several sub-indicators, in Factor 3: Presentation and organization, there were 5 and lastly in Factor 4: Accuracy and up-to-datedness of Information, there were 6 indicators. There were only two expected results that a resource can get from each factor – Passed or Failed.

In Factor 1: Content, the resource must score at least 21 points out of a maximum 28 points in order to pass, in Factor 2: Format, the resource must score at least 54 points out of a maximum 72 points, in Factor 3: Presentation and Organization, it must score at least 15 points out of 20 points and lastly in Factor 4: Accuracy and up-to-datedness of information, it must have a perfect score of 24 points in order to pass. Factors 1 to 3 were rated using a rating scale from 1-4 where: (4) Very Satisfactory (VS); (3) Satisfactory (S) / Not Applicable (N/A); (2) Poor; and (1) Not Satisfactory. The results of the evaluation of the evaluators for print resources of the developed instructional learning package in Computer Systems Servicing (CSS) were shown in Table 1 found below.

Table 1
Print Resources Evaluation Results

Factors	**Students N = 75**		**Teachers N = 2**		**Assessors N = 2**		**EPS N = 1**		**TOTAL N = 80**	
	P	F	P	F	P	F	P	F	P	F
1	75	0	2	0	2	0	1	0	80	0
2	75	0	2	0	2	0	1	0	80	0
3	75	0	2	0	2	0	1	0	80	0
4	n/a	n/a	2	0	0	2	1	0	3	2

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Legend:	
1 – Content	**P - Passed**
2 – Format	**F - Failed**
3 – Presentation and Organization	
4 – Accuracy and up-to-datedness of information	

The table showed that the print resources of the instructional learning package in CSS were evaluated in terms of four factors. In Factor 1: Content, 100% of the students, teachers, assessors and EPS respondents rated the resource "Passed". Also, in Factor 2: Format, 100% of the respondents rated the resource "Passed". Similarly, 100% of the respondents rated the resource "Passed" in Factor 3: Presentation and Organization. However, in Factor 4: Accuracy and up-to-datedness of information, the students were excluded from the set of evaluators because expertise was required to rate the resource in this factor accurately. In Factor 4, the evaluators checked whether there were conceptual, factual, grammatical, computational, obsolete and typographical error in the print resources included in the learning package. This factor was rated using a rating scale from 1-4 where: (4) Not present (meaning that a particular error was not present in the resource); (3) Error was present but very minor and must be fixed; (2) Error was present and requires major redevelopment; and (1) Poor. Do not evaluate further. The result showed that 3 out of 5 or 60% of the selected respondents rated the print resource "Passed" while the remaining 2 out of 5 or 40% of the selected respondents found some fixable minor errors that's why the resource did not achieve the required perfect score of 24 points to pass the fourth factor.

In the LRMDS evaluation rating sheet for non-print resources, there were four factors evaluated: A. Content Quality; B. Instructional Quality; C. Technical Quality and D. Other Findings. In each factor, there were several indicators. In Factor A: Content Quality, there were 10 indicators rated by the evaluators, similarly, in Factor B: Instructional Quality, there were 10 indicators rated, in Factor C: Technical Quality, there were 13 and lastly in Factor D: Other Findings, there were 6 indicators. There were only two expected results in the evaluation for non-print resources – Passed or Failed. In Factor A: Content Quality, the nonprint resource must score at least 30 points out of a maximum 40 points in order to pass, in Factor B: Instructional Quality, the resource must score at least 30 points out of a maximum 40 points, in Factor C: Technical Quality, it must score at least 39 points out of 52 points and lastly in Factor D: Other Findings, it must have a perfect score of 24 points in order to pass. Factors A to C were rated using a rating scale from 1-4 where: (4) Very Satisfactory (VS); (3) Satisfactory (S) / Not Applicable (N/A); (2) Poor; and (1) Not Satisfactory. The results of the evaluation of the evaluators for non-print resources of the developed instructional learning package in CSS were shown in Table 2 found below.

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Table 2
Non-Print Resources Evaluation Results

Factors	**Students N = 75**		**Teachers N = 2**		**Assessors = 2**		**EPS N = 1**		**TOTAL N = 80**	
	P	F	P	F	P	F	P	F	P	F
A	75	0	2	0	2	0	1	0	80	0
B	75	0	2	0	2	0	1	0	80	0
C	75	0	2	0	2	0	1	0	80	0
D	n/a	n/a	2	0	2	0	1	0	5	0

Legend:
A – Content Quality
B – Instructional Quality
C – Technical Quality
D – Other Findings

P - Passed
F - Failed

The table showed that the non-print resources of the instructional learning package in CSS were evaluated in terms of four factors. In Factor A: Content Quality, 100% of the students, teachers, assessors and EPS respondents rated the non-print resource "Passed". Also, in Factor B: Instructional Quality, 100% of the respondents rated the non-print resource "Passed". Similarly, 100% of the respondents rated the nonprint resource "Passed" in Factor C: Technical Quality. However, in Factor D: Other Findings, the students were excluded from the set of evaluators because expertise was required to rate the resource in this factor accurately. In Factor D, the evaluators checked whether there were conceptual, factual, grammatical, computational, obsolete and typographical error in the non-print resources included in the learning package. This factor was rated using a rating scale from 1-4 where: (4) Not present (meaning that a particular error was not present in the non-print resource); (3) Error was present but very minor and must be fixed; (2) Error was present and requires major redevelopment; and (1) Poor. Do not evaluate further. The result showed that 5 out of 5 or 100% of the selected evaluators rated the non-print resource "Passed" in Factor D.

This study is comparable to the study conducted by Ardinez (2001) from De La Salle University in which the main purpose is to develop and evaluate a learning package. Ardinez's study focused on the topic of magnetism for high school Physics students while the researcher's study focused on the core competencies of Computer Systems Servicing for Grade 10 TLE-ICT-CSS students. Ardinez's learning package was evaluated by three experts in the field of Physics using the validation for sourcebook form and an evaluation questionnaire while the researcher's learning package was evaluated by 75 students, 2 TLEICT-CSS teachers, 2 TESDA assessors and an EPS using the LRMDS evaluation rating sheet for print and non-print resources.

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The result of Ardinez's study showed that there were two evaluators rated the learning package "passed" and one "passed with revision". The result is somewhat similar to the result of the researcher's study which showed that there were three evaluators rated the four factors of the instructional learning package print resources "passed" while there were two who rated it "passed" on the three factors and "failed" on one factor. There were two evaluators rated it "failed" on Factor 4: Accuracy and Up-todatedness of Information because this factor in the LRMDS evaluation rating sheet for print resources required that the resource must have a perfect score of 24 points in order to pass. Since, there were some minor revisions that the two evaluators wanted to incorporate to further enhance the print resources of the instructional learning package, it is impossible to get a passing and perfect score of 24. The non-print resources of the instructional learning package, on the other hand, were rated "passed" by the evaluators.

5. Recommendations made by the Evaluators that can be Integrated in the Instructional Learning Package

For the purpose of enhancing the quality and contents of the developed instructional learning package, the researcher deemed it necessary to ask recommendations from the evaluators on how to enhance the instructional learning package. These can be integrated in the learning package for its refinement. These were presented in Matrix 1.

As to the print resources of the package, one of the evaluators suggested that the lesson about installing driver pack solution should be included in Module 1 instead in Module 2. The researcher was also told to update the content in Module 4, specifically in the lesson about back-up files. The operating system included in the topic must be updated from Windows XP to Windows 7.

One of the evaluators further mentioned that if possible, discuss the different operating system from past to present in Module1 and different computer threats. Moreover, the researcher was told to check the lesson regarding the subnet mask of IP addresses and include installation of MS Office and other basic software in the lesson about installing application software. MAC filter in setting the router was also recommended to be included in Module 2. It was also suggested that peer-to-peer networking must also be included in the lesson before setting-up client-server network in Module 3. The researcher was also told that some of the illustrations in Module 1 were not clear enough for the students to read therefore it is recommended to enlarge it to make it more readable. Added to this, one of the evaluators suggested that some black and white illustrations should be formatted to colored.

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Matrix 1

Evaluators' Suggestions and Recommendations

Instructional Learning Package Resources	Suggestions/Recommendations
Print Resources	▪ Installing Driver Pack Solution should be included in Module 1. ▪ Update the content with latest operating system for back-up files (from Windows XP to Windows 7 or later version.) ▪ If possible, discuss the different computer threats. ▪ If possible, discuss the different operating system from past to present. ▪ Check the subnet mask of IP addresses. ▪ Include installation of MS Office and other basic software in the installation of application software in Module 1. ▪ Include MAC Filter in setting the router in Module 2. ▪ Include peer-to-peer network before setting-up client-server network. ▪ Some of the illustrations are not clear enough for the students to read. It is recommended to enlarge it to make it more readable. ▪ Black and white illustrations which are not presentable can be formatted to colored.
Non-print Resources	▪ Use light colors for background to emphasize text. ▪ Provide self-assessment for the non-print

As to the non-print resources of the package, one of the evaluators suggested to use light colors for background in order to emphasize text and to provide self-assessment in each lesson.

All the recommendations and suggestions were taken into consideration by the researcher as he revised the initially prepared instructional learning package. The final copy of the revised IM was again validated by the evaluators for them to see that their worthy recommendations and suggestions were incorporated in the preparation of the revised instructional learning package.

The only test that remains is for this instructional learning package to be utilized in the actual teaching of the core competencies of CSS. Added to this is finding out whether the teacher and students who will use this can be really helped by the instructional learning package.

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The instructional learning package developed by the researcher gave the implication that a teacher can do things just to ensure that all competencies needed by the students are properly delivered.

SUMMARY

This study was centered on the development and evaluation of an instructional learning package in CSS. Specifically, it sought to answer the following questions: 1. What is the initial performance assessment of the respondents in Computer Systems Servicing as revealed in the TESDA self-assessment guide?; 2. What instructional learning package can be developed for core competencies in Computer Systems Servicing?; 3. What are the core competencies that can be integrated in the instructional learning package?; 4. What is the evaluation of the evaluators in the developed instructional learning package using the LRMDS evaluation rating sheet?; 5. What are the recommendations made by the evaluators that can be integrated in the instructional learning package in order to enhance it?

The researcher applied the Descriptive-Developmental-Evaluative approach as its methodology with evaluation rating sheet from the Learning Resource Management and Development System (LRMDS) as its research instrument. The locale of the study was in Sta. Elena cluster. There were 75 Grade 10 Technology and Livelihood Education (TLE) – Information and Communications Technology (ICT) students taking CSS, 2 TLE-ICT-CSS teachers, 2 TESDA assessors, 1 LRMDS supervisor and 1 EPS in TLE who participated in the study and assessed the quality of the developed output. They were selected purposively. The data were treated using frequency and summation as statistical tool.

Problem 1

What is the initial performance assessment of the student respondents in Computer Systems Servicing as revealed in the TESDA self-assessment guide?

Findings

In COC 1 - Install and Configure Computer Systems, 57 out of 75 or 76% of the student respondents were confident to perform the competency *Assembling computer hardware*, 27 out of 75 or 36% of the students were confident in performing the *Preparing Installer* competency, 37 out of 75 or 49% were confident in performing the *Installing operating system and drivers/peripheral installation work*, 33 out of 75 or 44% on the other hand, were confident in *Installing application software based on software* and lastly, 34 out of 75 or 45% were confident in performing *Conducting testing and documentation*. It turned out that 7 out of 75 or 9% of the students could possibly pass COC1.

In COC 2 – Set-up Computer Networks, 51 out of 75 or 68% of the student respondents were confident to perform the competency *Installing network cables*, 44 out of 75 or 59% of the students were confident in performing *Setting network configuration* competency, 40 out of 75 or 53% on the other hand, were confident in *Setting router/Wi-Fi/wireless access point/repeater configuration* and lastly, 28 out of

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75 or 37% were confident in performing the competency *Inspecting and testing configured computer networks.* It turned out that 15 out of 75 or 20% of the students could possibly pass COC2.

In COC 3 – Set-up Computer Servers, 37 out of 75 or 49% of the student respondents were confident to perform the competency *Setting-up user access,* 22 out of 75 or 29% of the students were confident in performing *Configuring network services* competency and lastly, 18 out of 75 or 24% were confident in performing the *Performing testing, documentation and pre-deployment procedures* competency. It turned out that 4 out of 75 or 5% of the students could possibly pass COC3.

Lastly in COC 4 – Maintain and Repair Computer Systems and Networks, 27 out of 75 or 36% of the student respondents were confident to perform the competency *Planning and preparing for maintenance and repair,* 49 out of 75 or 65% of the students were confident in performing *Maintaining computer systems and networks,* 7 out of 75 or 9% were confident in *Diagnosing faults of computer systems and networks,* 28 out of 75 or 37% on the other hand, were confident in performing *Rectifying/correcting defects in computer system and networks* and lastly, 29 out of 75 or 39% were confident in *Inspecting and testing the computer systems and networks* competency. It turned out that 2 out of 75 or 2% of the students could possibly pass COC4.

Based from the findings, the study revealed that none of the Grade 10 TLE-ICT students in Sta. Elena Cluster could possibly pass the assessment for National Certificate II in Computer Systems Servicing. The researcher also interviewed some students to know their perceptions on why they are not confident in performing some of the competencies in CSS. Interviewees have their own reasons why they failed the initial performance assessment. Most of them said that they already forgot some of the competencies, their notes were not enough, they have no updated modules, topics were not yet discussed, facilities and equipment for CSS were insufficient, some said they were afraid to explore and some of the competencies were not given focus in the school.

Conclusion

In COC1, the *Assembling computer hardware* was the competency that students can confidently perform the most and only few students were ready to perform all the included competencies. In COC2, the *Installing network cables* was the competency that the students can confidently perform the most and similar with COC1, only few students were ready to perform all of the included competencies. In COC3, the competency that students can confidently perform the most was *Setting-up user access* and few students were ready to perform all of the included competencies. And lastly, in COC4, the *Inspecting and testing the computer systems and networks* was the competency that students can confidently perform the most, and the same with the previous COCs, only few students could perform all the included competencies. Based from the findings, it can be concluded that there were only few students who can confidently perform the competencies in each COC and all of them were not yet ready to take the National Certificate II assessment in Computer Systems Servicing of TESDA.

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Recommendations

Since the Self-Assessment Guide (SAG) from TESDA was the only tool that was used by the researcher in assessing students' readiness for NCII assessment in Computer Systems Servicing, wherein they just checked whether they can confidently perform or not a particular competency, it is recommended to conduct hands-on assessment to validate further students' responses in SAG. Through this, students' initial performance will be assessed more accurately though it will take a lot of time.

Problem 2

What instructional learning package can be developed for core competencies in Computer Systems Servicing?

Findings

An instructional learning package for core competencies in Computer Systems Servicing (CSS) was developed by the researcher which aims to hone the ability of the students about CSS as their specialization independently. Added to this, the researcher addressed the call to improve the quality of instructional materials for use inside the classrooms in the school. The instructional learning package was entitled "THE CORE" which focuses on the four core competencies of CSS. It consists of print and nonprint resources.

The print resources composed of four (4) modules and a teacher's guide. The four modules represent the four core competencies in Computer Systems Servicing. Module 1 entitled *Installing and Configuring Computer Systems* has 132 pages, which composed of five (5) learning outcomes. Module 2 entitled *Setting-up Computer Networks* has 110 pages, which composed of four (4) learning outcomes. Module 3 entitled *Setting-up Computer Servers*, on the other hand has 120 pages, composed of three (3) learning outcomes and lastly, Module 4 entitled *Maintaining and Repairing Computer Systems and Networks* has 141 pages, composed of five (5) learning outcomes. Each module contains parts such as lesson objectives, lesson readings, watch and learn, self-check with answer key, performance task and main task. The teacher's guide on the other hand, composed of session plans, test papers with TOS and answer keys, performance tasks checklists, and tutorials on using Microsoft Forms and Flip Grid.

The non-print resources on the other hand, composed of a CD which contains consolidated interactive PowerPoint presentations and instructional videos. The interactive PPTs composed of buttons with hyperlinks that can be clicked by the students to view the objectives of the lesson, answer a pretest/posttest, read the contents of the lesson, watch a video clip related to the lesson and view the lesson references. The consolidated instructional videos were also in the CD which can be accessed by the students in order to watch video clip/s provided in a particular lesson in each module.

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Conclusion

The developed instructional learning package for core competencies in Computer Systems Servicing proved that the researcher innovated and created an instructional resource suited to the needs of learners in enhancing their skills in CSS. Moreover, creating an instructional learning package can be a big help in delivering teaching-learning process. The developed instructional learning package affirmed what has been said by Miller (1990) that self-learning packages were viable, cost effective methods of delivering instruction because all the needed competencies were compacted in a single package. It also affirmed what Bell (1997) said that one of the benefits of learning package is the facilitation of autonomous and reflective learning because it was designed to that aim and lastly, it was also supported by what Nikolajski (2002) stated that self-learning packages can be a viable alternative or adjunct to traditional way of teaching as this learning package can be used during crisis like pandemic outbreak that is very timely nowadays.

Recommendation

Though the nonprint resources can run at PC with minimum specifications, it is still recommended to have a computer with standard specifications of Intel Core i5 or equivalent for processor, Windows 8 or 10 operating system, 4 to 8 GB memory and at least 13" LCD monitor. There must be also an upgraded version of MS Office specifically PowerPoint installed in the PC in order to run the interactive PowerPoint and consolidated videos smoothly.

For future development/update of the instructional learning package, future researchers may redevelop it by using software that can run or compatible with different computer platforms or operating system such as iOS or android. It may also be redeveloped using Hypertext Mark-up Language (HTML) or webpage that only need a web browser like Chrome, Firefox, Edge, etc. This instructional package will be more flexible to the different platforms available.

Problem 3

What are the core competencies that can be integrated in the instructional learning package?

Findings

There were four (4) core competencies integrated in the developed instructional learning package in CSS. The first core competency integrated was *Installing and configuring computer systems* which was in Module 1 and has five (5) learning outcomes that students need to achieve such as *(LO1) Assemble computer hardware, (LO2) Prepare installer, (LO3) Install operating system and drivers for peripherals/devices, (LO4) Install application software and (LO5) Conduct testing and documentation.* The second core competency integrated was *Setting-up computer networks* which was in Module 2 and has four (4) learning outcomes: *(LO1) Install network cables, (LO2) Set network configuration, (LO3) Set router/WiFi/wireless access point/repeater configuration* and *(LO4) Inspect and test configured computer networks.* The third core competency integrated was *Setting-up computer server* which was in Module 3 and has three (3) learning outcomes that students need to achieve such as *(LO1) Set-up user access, (LO2) Configure network services and (LO3) Perform testing, documentation and pre-deployment procedures.*

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The fourth and last core competency integrated was *Maintaining and repairing computer systems and networks* which can be found on Module 4 and has five (5) learning outcomes: *(LO1) Plan and prepare for maintenance and repair, (LO2) Maintain computer systems and networks, (LO3) Diagnose faults of computer systems and networks, (LO4) Rectify/correct defects in computer systems and networks, and (LO5) Inspect and test the computer systems and networks.* Each learning outcomes found in the four modules consists of lessons with specific objectives which complemented the competencies provided in the CSS curriculum guide of DepEd.

Conclusion

The developed instructional learning package covered all the core competencies found in the current CSS curriculum guide of DepEd, which are needed by the students to pass the National Certificate II assessment of TESDA. It includes *Installing and configuring computer systems, Setting-up computer networks, Setting-up computer servers* and *Maintaining and repairing computer systems and networks.* Aside from it, the instructional learning package also adhered to the competencies found in the TESDA curriculum guide. The researcher identified a middle ground where DepEd and TESDA required competencies will meet and be reflected to the contents of the developed instructional learning package.

Recommendation

Given that the instructional learning package already provided all the lessons which are aligned to the core competencies of CSS, DepEd and TESDA curriculum guide, teachers should inculcate to their students the importance of having regular practice of the skills using instructional materials in CSS to master the core competencies. Another thing is, schools offering specialization in CSS must find ways to provide students with the materials and equipment needed because, interaction with a material is a huge factor for the students to learn the skills. The instructional learning package in CSS must be supported by necessary materials. Teachers should also update themselves if there were changes in the TESDA assessment process. Currently, the TESDA has no updates on the competencies included in the assessment but there may be some changes in the assessment process in the future so, teachers/trainers must be always aware on those matters.

Problem 4

What is the evaluation of the evaluators in the developed instructional learning package using the LRMDS evaluation rating sheet?

Findings

The print resources of the instructional learning package in CSS were evaluated in terms of four factors. In Factor 1: Content, 100% of the students, teachers, assessors and EPS respondents rated the resource “Passed”. Also, in Factor 2: Format, 100% of the respondents rated the resource “Passed”. Similarly, 100% of the respondents rated the resource “Passed” in Factor 3: Presentation and Organization. However, in Factor 4: Accuracy and up-to-datedness of information, 3 out of 5 or 60% of the selected respondents rated the print resource “Passed” while the remaining 2 out of 5 or 40% of the selected

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respondents found some fixable minor errors that's why the resource did not achieve the required perfect score of 24 points to pass the fourth factor.

The non-print resources of the instructional learning package in CSS were also evaluated in terms of four factors. In Factor A: Content Quality, 100% of the students, teachers, assessors and EPS respondents rated the non-print resource "Passed". Also, in Factor B: Instructional Quality, 100% of the respondents rated the non-print resource "Passed". Similarly, 100% of the respondents rated the non-print resource "Passed" in Factor C: Technical Quality. Lastly, in Factor 4: Other Findings, 5 out of 5 or 100% of the selected evaluators rated the non-print resource "Passed".

However, due to some reasons, the LRMDS supervisor was not able to evaluate the print and nonprint resource of the package.

Conclusion

From the findings, it can be concluded that the print resources of the instructional learning package passed the evaluation of the evaluators as to its content, format, presentation and organization even though there were some fixable minor errors found on some contents and as a result, it did not achieve the required perfect score to pass the fourth factor which is accuracy and up-to-datedness of information.

The non-print of the instructional learning package on the other hand also passed the evaluation of the evaluators as to its content quality, instructional quality, technical quality and other findings pertaining to technical errors, content errors, etc.

In overall, the instructional learning package, both the print and non-print resources passed the evaluation of the evaluators with some minor and fixable revisions and it can be used in teaching and learning the core competencies of CSS.

The result supported the study conducted by Ardinez (2001) from De La Salle University in which his main purpose was also to develop and evaluate a learning package on the topic of magnetism for high school Physics students. The result of this study is similar to the result of Ardinez' study in which some of the evaluators rated the instructional resource passed and others rated it passed with minor revisions.

Recommendation

Based from the conclusion made, it is recommended that after minor revisions, the developed instructional learning package for core competencies in CSS should be utilized by students taking up CSS specialization in Junior HS or Senior HS. This is for them to learn independently the core competencies needed to pass the National Certificate II assessment in CSS.

For future researchers who will also develop an instructional learning package, it is recommended to consider several factors both in print and non-print resources. There were four factors to be considered

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in developing a print resource and another four factors in developing a non-print resource in order to pass the evaluation using the LRMDS evaluation rating sheet.

The factors to be considered in developing a print resource are the content, format, presentation/organization and accuracy and up-to-datedness of information. As to the content, it must be suitable to students level of development, contribute to the achievement of specific objectives of the subject area and grade level for which it is intended, provides for the development of creative and critical thinking skills, and free from ideological, cultural, religious, racial and gender biases/prejudices. It may also enhance the development of desirable values and traits, has the potential to arouse interest of the students and may also provide adequate warning or cautionary measures in topics and activities where safety and health are of concern.

As to the format, the size of prints must be appropriate to intended user, spaces between letters and words must facilitate reading, fonts must be easy to read and printing must be of good quality. The illustrations must be simple and easily recognizable, clarify and supplement the text, realistic and use appropriate colors, attractive and appealing and may be culturally relevant. The design and layout must be pleasing to look at, simple and there must be harmonious blending of elements. The paper used must contributes to easy reading and binding must be durable to withstand frequent use. The resource must be easy to handle and relatively light.

As to the presentation and organization, it must be engaging, interesting and understandable, there must be logical and smooth flows of ideas, vocabulary level must be adapted to the target reader's likely experience and level of understanding, the length of sentences must be suited to the comprehension level of the target reader and sentences and paragraph structures must be varied and interesting to the target reader.

As to the accuracy and up-to-datedness of information, it must be free from conceptual, factual, grammatical, computational, typographical errors and obsolete information.

The factors to be considered in developing a non-print resource on the other hand are content quality, instructional quality, technical quality and other related findings.

As to the content quality, the content of the non-print resource must be consistent with the topics/skills found in the DepEd Learning Competencies for the subject and grade level it was intended, concepts to be developed must contribute to enrichment, reinforcement, or mastery of identified learning objectives. Contents of the resource must be accurate, up-to-date, logically developed and organized, free from cultural, gender, racial or ethnic bias, stimulates and promotes critical thinking, relevant to real-life situations and promotes positive values.

As to the instructional quality, the purpose of the non-print material must be well defined and achieves its defined purpose. The learning objectives must be clearly stated and measurable. The level of difficulty must be appropriate for the intended target users. If there were graphics, colors or sounds used it must be appropriate for instructional reasons. Feedbacks on target user's responses must effectively employed.

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As to the technical quality, audios must enhance understanding of concept, speech and narration must be clear and easily understood, music and sound effects must be appropriate and effective for instructional purposes. Screen displays must be uncluttered, easy to read and aesthetically pleasing. The material must be used easily and independently and will run using minimum system requirements and if there were programs/software involved, it must be free from technical errors.

As to the other factors, the material must be free from conceptual, factual, grammatical, computational errors and obsolete information.

Problem 5

What are the recommendations made by the evaluators that can be integrated in the instructional learning package in order to enhance it?

Findings

The set of evaluators consisting of TLE-ICT-CSS students, teachers, TESDA assessors and an EPS in TLE gave worthy recommendations and suggestions that can be integrated by the researcher in the print and non-print resources of the developed instructional learning package in CSS.

As to the print resources of the package, one of the evaluators suggested that the lesson about installing driver pack solution should be included in Module 1 instead in Module 2. The researcher was also told to update the content in Module 4, specifically in the lesson about back-up files. The operating system included in the topic must be updated from Windows XP to Windows 7.

One of the evaluators further mentioned that if possible, discuss the different operating system from past to present in Module1. Moreover, the researcher was told to include installation of MS Office and other basic software in the lesson about installing application software. MAC filter in setting the router was also recommended to be included in Module 2. It was also suggested that peer-to-peer networking must also be included in the lesson before setting-up client-server network in Module 3. The researcher was also told that some of the illustrations in Module 1 were not clear enough for the students to read therefore it is recommended to enlarge it to make it more readable. Added to this, one of the evaluators suggested that some black and white illustrations should be formatted to colored.

As to the non-print resources of the package, one of the evaluators suggested to use light colors for background in order to emphasize text.

Conclusion

The recommendations and suggestions given by the evaluators were integrated by the researcher to further enhance the acceptability of the instructional learning package that was developed.

As to the print resources, the recommendations were followed by the researcher. Lesson about installing driver pack solution was included in Module 1 instead in Module 2. The content in Module 4 was also updated specifically on the lesson about back-up files. Operating system included in the topic were

updated from Windows XP to Windows 7. Different operating systems from past to present were also discussed in Module 1. Moreover, the researcher also included installation of MS Office and other basic software in the lesson about installing application software. MAC filter in setting the router was also included in Module 2. Peer-to-peer networking was also included in the lesson before setting-up clientserver network in Module 3. The researcher also enlarged some of the illustrations in Module 1 to make it more readable. Added to this, black and white illustrations were formatted to colored.

As to the non-print resources of the package, the researcher followed the suggestion of evaluators to use light colors for background in order to emphasize text.

All the recommendations and suggestions were taken into consideration by the researcher as he revised the initially prepared instructional learning package. The final copy of the revised IM was again validated by the evaluators for them to see that their worthy recommendations and suggestions were incorporated in the preparation of the revised instructional learning package.

Recommendation

An instructional material must be validated first before it can be utilized by the teachers and students. Since this study has a broad scope and required a lot of time in finishing the output, the researcher developed the learning package first and let the evaluators validate its content. For this, further study should be taken into consideration to measure the effectiveness and validity of the developed instructional learning package for core competencies in CSS in the actual teaching-learning process. Moreover, aside from testing its validity, future researchers may also find out whether the package can greatly affect students' attitude towards self-study and if it can really help in helping them to regulate their own learning. Researchers may also employ a particular method or approach in teaching that can be attributed in the developed instructional learning package.

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