

Teaching Computer Systems Servicing Competencies on Students' Skills Development and Practical Learning Application

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Abstract— This research aimed to explore how teaching of Computer Systems Servicing (CSS) competencies influences in students' skills development and practical learning application. It determined the level CSS competencies, the level of the development of students' skills, and the level of learners' practical learning application real-life situation. It also examined the significant relationship and effect of teaching CSS competencies on enhancing students' abilities and practically applying the knowledge, theories, and principles in real-world context. The study employed a quantitative descriptive research design, which was appropriate for measuring numerical data known for its reliability and validity. The study was participated in by 155 Grade 10 students from a public secondary school in Pila, Laguna, who were purposively selected as respondents. They were involved to accomplish a survey questionnaire and performance activities, which were assessed by the teacher through structured rubrics along with the standard and industry guidelines in ICT and CSS competency. The results revealed that the level of teaching CSS competencies attained a Very Highly Competent, indicating that supportive teaching learning environment fosters the development of learners' skills, as well as effective integration of hands-on activities. Moreover, the level of students' skills development obtained a very highly developed, this signifies that students were observed to perform ICT-based tasks that were aligned to the industry standards. Furthermore, in terms of the level of students' practical learning application, students attained outstanding remarks, indicating that learners effectively applied the principles and concepts they studied and their knowledge regarding CSS competencies in real-life contexts that follows ICT industry standards and guidelines. The findings revealed that there is a significant effect and relationship between teaching CSS competencies in developing students' skills and their practical learning application. The teaching of CSS competencies has significant relationship and effect in students' skill development and practical learning application that leads to rejection of both hypotheses. Additionally, teaching the lesson in CSS that contains all competencies enhanced students' abilities to perform ICT-related tasks, indicating that students can use their learned knowledge and theories to apply in practical and real-world contexts. It is recommended for the teachers to obtain National Certification (NC II) and Trainers Methodology Level I from the Technical Education and Skills Development Authority (TESDA) to improve their competence and ensure that they possess the necessary technical and pedagogical abilities in teaching CSS to students.

Keywords— Computer Systems Servicing (CSS), Skills development, Practical learning application, Technical Education and Skills Development Authority (TESDA), National Certification (NC II), Trainers Methodology Level I

I. INTRODUCTION

In modern education, technology has been a great influence in reshaping the educational landscape through knowledge delivery, resulting that teaching was viewed as dynamic process and learning becomes more accessible and responsive to the students' needs. It has been emphasized that technology fosters the teaching and learning process (Turnbull et al., 2020). According to Catapang et, al. (2023) teaching and learning as an interactive and dynamic process where students are more engaged in learning process. Teaching and learning are viewed as interconnected process which fosters not only the acquisition of knowledge but also promoting active involvement in the learning process.

According to Tomaro (2018), technological development is essential to delivering quality education and assisting the learners in enhancing their 21st century skills by acquiring digital literacy. One of the specialized technical-vocational courses offered in the K to 12 curriculum is Computer Systems Servicing (CSS), which equips learners with competencies in installing, configuring, and maintaining computer systems and networks. Payteren (2020), further stated that Computer System Servicing (CSS) covers basic and common competencies such as installing, maintaining, configuring, and diagnosing computer systems and networks.

In the context of education, students' skills development refers to the enhancement of both technical and soft skills that prepare learners for future careers and lifelong learning. In addition, the skill development learning process helps students not only to think about marks, but also beyond that. Learning skills can be regarded as an inseparable part of education since this knowledge prepares individuals and provides them with tools to solve real-life challenges and work in several spheres (Sourabh, 2025).

Through CSS, students develop technical expertise such as troubleshooting, hardware servicing, and network configuration, while also strengthening critical thinking, collaboration, and communication skills. These competencies contribute to their overall readiness for employment or further studies in the field of Information and Communications Technology (ICT).

Furthermore, practical learning application plays a vital role in ensuring that the knowledge gained in the classroom is applied in real-world scenarios. Anderson (2024), explains

that practical application refers to the process of taking theoretical knowledge and implementing it in real-world scenarios. It plays a vital role in various fields such as education, business, and personal development. Understanding practical application is crucial for achieving productivity and effective time management. By closing the gap between what we learn and how we utilize that information, it strengthens our capacity for meaningful application of ideas.

Furthermore, many pupils may comprehend the theories, concepts, and ideas of the subject they are learning at school, but they may also have difficulty putting the skills into practice in real-world scenarios. Most common indicator of this problem is the absence of practice of integrating and synthesizing the principles and theories they learned, due to limited hands-on experience in schools because of insufficiency in learning materials. Empowering the experiential and real-world learning bridges the gaps between the skills they acquired in school and its practical application (Wart et al., 2020).

Therefore, by engaging students in hands-on activities, laboratory exercises, and actual servicing tasks, students are able to bridge the gap between theory and practice. This practical approach not only reinforces learning but also builds confidence, efficiency, and adaptability qualities that are crucial in the ever-evolving technological landscape.

1.1 Statement of the Problem

Problem/s which were addressed by the research

This study aimed to explore how the teaching of Computer Systems Servicing (CSS) competencies influences students' skills development and the practical application of their learning.

Specifically, it sought answer to the following research questions:

1. What is the level of Computer Systems Servicing competencies in terms of:
 - 1.1 Installing and Configuration of Computer Systems;
 - 1.2 Setting up Computer Networks;
 - 1.3 Setting up Computer Server; and
 - 1.4 Maintaining and Repairing Computer Systems?
2. What is the level of students' skills development in terms of:
 - 2.1 Technical Skills;
 - 2.2 Cognitive Skills;
 - 2.3 Problem-Solving Skills; and
 - 2.4 Decision-Making Skills?
3. What is the level of students' practical learning application in terms of:
 - 3.1 Computer Hardware Assembly;
 - 3.2 Network Cables Installation;
 - 3.3 Network Services Configuration; and
 - 3.4 Computer Hardware and Software Repair?
4. Is there a significant relationship between teaching computer systems servicing competencies and students' skills development?
5. Is there a significant effect in teaching computer systems servicing competencies and students' practical learning application?

II. METHODOLOGY

The study employed a quantitative descriptive research design, which was appropriate for measuring numerical data known for its reliability and validity. The study was participated in by 155 Grade 10 students from a public secondary school in Pila, Laguna, who were purposively selected as respondents. They were involved to accomplish a survey questionnaire and performance activities, which were assessed by the teacher through structured rubrics along with the standard and industry guidelines in ICT and CSS competency.

III. RESULTS AND DISCUSSION

This chapter discusses the results derived from the data gathered in this study. The following tabular presentations and discussions further describe how the teaching of Computer Systems Servicing (CSS) competencies affect students' skill development and the practical application of their learning.

Level of Computer Systems Servicing's Competencies

In this study, the level of computer systems servicing competencies was describe in terms of installing and configuring of computer systems, setting up computer networks, setting up computer servers, as well as maintaining and repairing computer systems and was determined using the mean and standard deviation.

Moreover, in this section of the paper, the data gathered were interpreted to provide insightful outcomes regarding the level of CSS competencies and their significant relationship in developing students' skills and practical learning application.

Overall, the interpretation of the presented data indicates the level of teachers' competence in teaching CSS competencies and how these competencies contribute to learners' skill development in sharpening their knowledge, learned theories and principles as well as shaping their overall preparedness as they step to the real-world context and in ICT work working environments.

The researcher presented the following tables below to clearly indicate the level of teachers' competence in Computer System Servicing.

Table 1. Level of Computer Systems Servicing Competencies in terms of Installing and Configuration of Computer Systems

Statements	Mean	SD	Remarks
The teacher can...			
...plan and prepare the tools for assembling computer hardware.	4.45	0.79	Strongly Agree
...facilitate students in creating a software installer according to the software utilization guide.	4.43	0.87	Strongly Agree
...demonstrate the methods for installing different operating systems and drivers for peripherals/devices.	4.39	0.77	Strongly Agree
...guide and support students in installing and updating various application software in a computer.	4.65	0.68	Strongly Agree
...integrate activities for testing and documenting the reliability and performance of computer systems and networks.	4.52	0.71	Strongly Agree
Weighted Mean	4.49		
SD	0.77		
Verbal Interpretation			Very Highly Competent

Table 1 shows the teachers' level of computer systems servicing competencies in terms of installing and configuration of computer systems.

The teacher was observed to be guiding and supporting students in installing and updating various application software showing their efficiency in performing hands-on software-related tasks. They could integrate activities to test and document the system's performance and its reliability. Their instructional readiness and knowledge were manifested in planning and preparing tools for assembling computer hardware and facilitating students in creating software installers based on utilization guides. Competence in demonstrating methods for installing operating systems and device drivers was also strongly agreed upon by the respondents.

The level of Computer Systems Servicing (CSS) competencies in terms of installing and configuration of computer systems obtained the overall weighted mean of 4.49 with a standard deviation of 0.77, verbally interpreted as Very Highly Competent, indicates that respondents strongly agreed that teachers demonstrate a very strong level of competence in this aspect.

Overall, the results indicate that teachers' effective supportive teaching-learning environment for learners contributes to the learners' skills acquisition and development. Moreover, the effective teaching methodology can be attributed to their strengthened developed competencies, particularly in installing and configuring computer systems. The students' mastery served as the key component in developing the necessary skills, such as in activities including proper demonstration, guided practice, and timely feedback during laboratory activities to promotes hands on experience in learning and applying it to real-life applications.

Table 2. Level of Computer Systems Servicing Competencies in terms of Setting Up Computer Networks

Statements The teacher can...	Mean	SD	Remarks
...present clearly the steps in installing network cables in a computer.	4.53	0.59	Strongly Agree
...demonstrate to students the correct installation procedures for safety.	4.52	0.68	Strongly Agree
...guide the learners in diagnosing network faults and connectivity through IP (Internet Protocol) configuration.	4.50	0.77	Strongly Agree
...provide assistance in setting up a router or Wi-Fi network, including LAN, WAN, and security settings.	4.49	0.69	Strongly Agree
...show how to inspect and test computer networks to ensure they are safely and properly arranged.	4.50	0.81	Strongly Agree
Weighted Mean	4.51		
SD	0.72		
Verbal Interpretation	Very Highly Competent		

Table 2 reveals the findings of level of computer systems servicing competencies of teacher in terms of Setting Up Computer Networks.

The result discussed that teachers' competency has been significantly manifested based on student's response. It was observed that teachers' teaching methodologies influenced the learner's knowledge and insights in how to properly identify

malfunctions in computer systems and how to resolve the issues based on the CSS standard procedures. It was revealed that the teacher provides effective hands-on activities most especially in security settings including setting up WiFi, routers, LAN, and WAN. The instructor also emphasized the importance of following the guidelines in resolving issues in setting up computer network systems through clear demonstration of the steps and procedures in setting up computer network systems.

The level of teachers' Computer Systems Servicing (CSS) competence in terms of Setting up computer networks obtained an overall weighted mean of 4.51 with a standard deviation of 0.72, verbally interpreted as Very Highly Competent, indicating that students strongly agreed that the teacher was competent enough in facilitating activities that enhance students' knowledge and learnings in setting up computer networks.

Moreover, the results show that teachers' competence level is a significant factor in facilitating students' acquisition of appropriate knowledge and skills in terms of setting up computer network systems, especially following the Computer System Servicing standard procedures. Additionally, it indicated that teachers who demonstrated strong mastery of technical content as well as effective instructional strategies in delivering lessons aligned in CSS are able to facilitate students in following the established industry-based standards in dealing with ICT-based performance tasks and activities.

Table 3. Level of Computer Systems Servicing Competencies in terms of Setting Up Computer Servers

Statements The teacher can...	Mean	SD	Remarks
...integrate activities for students to manage user access in accordance with network policies and security requirements.	4.43	0.74	Strongly Agree
...support learners in updating necessary network service modules or add-ons.	4.41	0.83	Strongly Agree
...monitor the process of verifying if the network services function properly through testing and monitoring.	4.37	0.83	Strongly Agree
...address the unexpected network issues or conditions following standard procedures.	4.48	0.66	Strongly Agree
...assist students in testing and preparation procedures to ensure the network is ready for use.	4.52	0.68	Strongly Agree
Weighted Mean	4.44		
SD	0.76		
Verbal Interpretation	Very Highly Competent		

Table 3 presents the results of teachers' competency level in Computer System Servicing in terms of Setting up computer servers.

The results presented the level of teacher's competence in integrating effective activities for students to improve their skills and enhance their knowledge regarding setting up computer servers. The teacher integrated several practices that focus on setting up computer servers including managing user access, updating necessary network services modules, and verifying proper functionality of computer servers. Also, teachers' support served as the foundation of students in their activities and studying the process of setting up computer servers, by means of thorough monitoring in server testing to

resolve issues. Lastly, the teacher provide assistance to the students in resolving problems to ensure network functionality. These competencies of the teacher were highlighted as it improved the overall performance of students by providing them with adequate knowledge and skills in setting up computer servers.

The teachers' competence in terms of setting up computer servers obtained an overall mean of 4.44 and standard deviation of 0.76, and verbally interpreted as Very Highly Competent, proving that the respondents agreed that teachers' support, assistance, and effective integration of hands-on laboratory activities allowed them to become more knowledgeable in setting up computer servers.

In summary, the results showed that the teacher demonstrated strong competence in integrating effective activities related to setting up computer servers, including managing user access, updating network service modules, and verifying server functionality, which enhanced students' knowledge and skills. Continuous teacher support through close monitoring, server testing, and problem resolution significantly improved students' overall performance in server setup and network functionality.

Table 4. Level of Computer Systems Servicing Competencies in terms of Maintaining and Repairing Computer System

Statements	Mean	SD	Remarks
The teacher can...			
...apply effective methods to plan and prepare the needed tools, materials, and safety measures to maintain and repair computer systems and networks.	4.59	0.73	Strongly Agree
...demonstrate systematic approaches in troubleshooting computer systems and networks to ensure proper and safe operation.	4.48	0.54	Strongly Agree
...use clear instructions in resolving computer system and network problems, following standard procedures.	4.41	0.74	Strongly Agree
...explain the appropriate safety techniques in repairing computer systems and network issues by safely replacing or adjusting damaged parts.	4.38	0.83	Strongly Agree
...describe clearly the effective methods in ensuring that computer systems and networks to operate safely and meet manufacturer standards.	4.53	0.71	Strongly Agree
Weighted Mean	4.48		
SD	0.72		
Verbal Interpretation	Very Highly Competent		

Table 4 clearly presents the detailed level of teachers' competence in terms of maintaining and repairing computer systems.

The data obtained in the results clearly depicts the teachers' level of competence in performing the necessary teaching methodologies and approaches in relation to enhancing the students' skills and learnings in maintaining and repairing computer systems. Also, teacher was observed to be detailed in discussing effective procedures and methods to ensure safe operations of computer systems. Moreover, discussing safety techniques is necessary in learning and developing students' skills, also clear instructions in performing troubleshooting, and resolving emerging issues in accordance with standard procedures in terms of repairing and

maintaining computer systems. Lastly, the result implies the teachers' impact on students' skills through demonstrating systematic approaches in troubleshooting computer systems and networks to ensure proper and safe operation.

Generally, the results indicate that teachers demonstrated strong competence in applying effective teaching methodologies to enhance students' skills in maintaining and repairing computer systems, including emphasizing safety procedures and standard troubleshooting practices. Moreover, incorporating clear instructions, step-by-step process, and problem-solving approaches significantly contributes to developing students' ability to run through and test issues accurately and implement effective solutions. It fosters not only the technical performance of the learners but also strengthens their level of confidence in handling computer networks and system to ensure safe, efficient, and reliable operation in real-world contexts. Overall, the level of competence of teacher in teachers' competence in terms of Maintaining and repairing Computer systems obtained the grand mean of 4.48 and standard deviation of 0.72, with a verbal interpretation of very highly competent, indicating that the teacher clearly provided support and guidance in demonstrating and discussing the proper ways of maintaining and repairing computer systems.

Level of Students' Skills Development

In this section of the paper, the level of students' skills development is described in terms of technical, cognitive, problem-solving, and decision-making skills and evaluated through mean and standard deviation.

Overall, the interpretation of the gathered data indicates the level of students' skills development and how teaching CSS competencies improve students' ability in technical and cognitive aspect as well as sharpening critical thinking and logical reasoning to improve their problem and decision-making skills.

Table 5. Level of Students' Skills Development in terms of Technical Skills

Statements	Mean	SD	Remarks
The student can...			
...acquire competency in assembling and disassembling computer systems.	4.48	0.77	Strongly Agree
...develop accuracy in identifying hardware and software components.	4.55	0.68	Strongly Agree
...apply proper techniques in installing operating systems and applications.	4.54	0.59	Strongly Agree
...demonstrate proficiency in troubleshooting computer-related problems.	4.42	0.76	Strongly Agree
...enhance capability in using diagnostic tools and software.	4.55	0.79	Strongly Agree
Weighted Mean	4.51		
SD	0.73		
Verbal Interpretation	Very Highly Developed		

Table 5 presents the result of the level of students' skills development in terms of Technical Skills.

The students were observed to develop their technical skills by acquiring necessary competencies in computer system servicing systems. The result showed that the students' skills in accuracy in software and hardware components have improved. Also, the application of proper methodologies and

techniques in installing and operating systems and applications as well as enhancing their skills in using necessary diagnostic tools and software, was evident in their development, and this set of skills received the highest rating. Furthermore, the students' developed skills in assembling and disassembling several computer systems and demonstrating proficient troubleshooting in computer related issues also gained high rating in the sets of skills.

Generally, the students' skills development in terms of technical skills obtained a weighted mean of 4.51 with a standard deviation of 0.73 and was verbally interpreted as Very Highly Developed, clearly indicating that students enhanced their technical skills in terms of computer system servicing through hands-on activities following the standardized guidelines.

In summary, students significantly improved their technical skills in computer system servicing, particularly in identifying hardware and software components, it has been observed that students can apply proper installation methodologies, and using diagnostic tools effectively. they also demonstrated strong level of proficiency in assembling and disassembling computer systems as well as in troubleshooting computer-related issues which received high ratings.

Table 6. Level of Students' Skills Development in terms of Cognitive Skills

Statements The student can...	Mean	SD	Remarks
...develop critical thinking in analyzing computer system issues.	4.56	0.76	Strongly Agree
...apply logical reasoning in solving hardware and software problems.	4.41	0.67	Strongly Agree
...enhance decision-making skills in selecting appropriate troubleshooting methods.	4.42	0.69	Strongly Agree
...strengthen analytical ability in interpreting diagnostic results.	4.45	0.71	Strongly Agree
...demonstrate problem-solving strategies in servicing computer systems.	4.52	0.71	Strongly Agree
Weighted Mean	4.47		
SD	0.71		
Verbal Interpretation	Very Highly Developed		

Table 6 illustrates the findings of the level of students' skills development regarding their cognitive skills.

It indicates the students have developed cognitive abilities where they enhanced their critical thinking skills in analyzing computer system servicing issues. Also, they can demonstrate effective problem-solving strategies in computer systems servicing, and they also strengthened their analytical ability in interpreting and comprehending diagnostic results. Additionally, students also developed their decision-making skills and logical reasoning application in solving hardware and software systems. The students were able to perform ICT related task and accomplishing real-life activities with their strengthened and enhanced cognitive ability.

The students' skills development in CSS competency with regards to cognitive skills gained an overall weighted mean of 4.47, SD=0.71, and was verbally interpreted as Very Highly Developed, it implies the importance of developing their critical thinking skills in performing ICT related tasks.

Table 7. Level of Students' Skills Development in terms of Problem-Solving Skills

Statements The student can...	Mean	SD	Remarks
...identify the root cause of computer hardware and software issues.	4.48	0.67	Strongly Agree
...generate multiple solutions to address servicing problems.	4.43	0.68	Strongly Agree
...apply systematic steps in resolving technical difficulties.	4.37	0.72	Strongly Agree
...demonstrate creativity in finding solutions to complex servicing tasks.	4.46	0.76	Strongly Agree
...evaluate the effectiveness of applied solutions after troubleshooting.	4.57	0.63	Strongly Agree
Weighted Mean	4.46		
SD	0.70		
Verbal Interpretation	Very Highly Developed		

Table 7 presents the results obtained in students' skills development in terms of problem-solving skills.

Based on the result, the learners were observed to be in a developed state of problem-solving skills in dealing with learning CSS competencies. Learners can evaluate the level of effectiveness of applied solutions and methods after performing troubleshooting, and identifying the root causes of the problems encountered in computer hardware and software issues. Also, demonstrating a creative solution in finding ways to address computer related activities. These notable scenarios were highly achieved by the students implying their significant development in problem-solving in computer activities. Moreover, generating multiple solutions in addressing certain problems encountered in computer services and application of systematic procedures in resolving technical difficulties were found to be in high rating as well. This indicates that learners developed their skills in problem solving skills in learning CSS competencies.

Overall, the level of students' skills development in terms of problem-solving skills obtained an overall mean of 4.46, standard deviation of 0.70 and verbally interpreted as Very Highly Developed. This indicates that learners developed essential problem-solving skills in learning CSS competencies, enabling them to effectively analyze, diagnose, and resolve computer system issues in real-world ICT settings.

Table 8. Level of Students' Skills Development in terms of Decision-Making Skills

Statements The student can...	Mean	SD	Remarks
...analyze available information before making technical decisions.	4.54	0.60	Strongly Agree
...select appropriate tools and methods for computer servicing tasks.	4.46	0.79	Strongly Agree
...evaluate different options before choosing a troubleshooting approach.	4.39	0.73	Strongly Agree
...decide on effective solutions when multiple problems are presented.	4.66	0.68	Strongly Agree
...apply logical reasoning in making servicing-related judgments.	4.52	0.69	Strongly Agree
Weighted Mean	4.51		
SD	0.71		
Verbal Interpretation	Very Highly Developed		

Table 8 shows the level of students' skills development in relation to decision-making skills.

The result presents the level of learners' decision-making skills. It was observed that learners can effectively come up with insightful decisions by incorporating effective solutions when multiple problems are encountered. Additionally, this skill is highly developed, as learners analyze the available data and information before making concrete and technical decisions, as well as effective application of logical reasoning in making a computer-related decisions to properly resolved a major ICT issue. Moreover, selecting appropriate tools and methodologies in computer servicing tasks and evaluating several options in choosing a troubleshooting approach were observed to be highly developed as they learn and strengthen their knowledge and skills in CSS competencies.

Overall, the level of students' skills development, particularly in decision-making skills, attained a weighted mean of 4.51 with a standard deviation of 0.71 and was verbally interpreted as Very Highly Developed. The results imply that learners have significantly strengthened their skills in analyzing real-life situations, evaluating possible options, and selecting appropriate solutions in addressing various ICT tasks and issues such as complex and technical problems in computer systems. The results highlight the importance of fostering strong decision-making abilities among learners, which are essential for effective troubleshooting, problem resolution, and responsible performance in real-world computer system servicing activities.

Level of Students' Practical Learning Application

In this study, the level of students' practical learning application was evaluated in terms of computer hardware assembly, network cable installation, network services configuration, and computer hardware and software repair. Also, these skills were carefully measured using the weighted mean and standard deviation.

Overall, the results presented indicated the level of students practical learning application and examined how CSS competencies affect it in fostering the students' ability in applying learned knowledge and theories into practical and real-world contexts in ICT field.

Table 9. Level of Students' Practical Learning Application in terms of Computer Hardware Assembly

Score	Frequency	Percentage	Descriptive Equivalent
17 – 20	144	92.90%	Outstanding
13 – 16	11	7.10%	Very Satisfactory
9 – 12	0	0	Satisfactory
5 – 8	0	0	Fairly Satisfactory
0 - 4	0	0	Poor
Mean Score	18.92		
SD	1.50		
Descriptive Equivalent	Outstanding		

The above table presents the level of students' practical learning application in terms of computer hardware assembly. Most of the scores were concentrated in the higher range, resulting in an outstanding level of practical learning application, as it obtained the mean score of 18.92 and a standard deviation of 1.50 indicated that students, on average, achieved outstanding results. The very high level of

performance implies that students were able to follow all necessary safety measures in preparing and observing safety protocols while performing the activity. Moreover, it indicated that all components, including wires, were correctly installed, connected, and properly managed. Also, students were able to clearly explain and demonstrate each step and procedure in assembling and disassembling computer hardware components.

Table 10. Level of Students' Practical Learning Application in terms of Network Cables Installation

Score	Frequency	Percentage	Descriptive Equivalent
17 – 20	138	89.03%	Outstanding
13 – 16	17	10.97%	Very Satisfactory
9 – 12	0	0	Satisfactory
5 – 8	0	0	Fairly Satisfactory
0 - 4	0	0	Poor
Mean Score	18.59		
SD	1.57		
Descriptive Equivalent	Outstanding		

The above table shows the findings on the level of students' practical application in terms of network cable installation. The results yielded an overall mean score of 18.59 with a standard deviation of 1.57, resulting in a descriptive value of outstanding. The findings indicated that students were able to prepare and handle the needed materials and tools in the activity and followed the required safety procedures and guidelines and ensure the proper insertion of cable jackets and carefully check the wires before crimping. Additionally, students can properly run through LAN cable testing and examine it effectively to verify its level of functionality, indicating the students' ability to apply learned methodologies and procedures in practical tasks.

Table 11. Level of Students' Practical Learning Application in terms of Network Services Configuration

Score	Frequency	Percentage	Descriptive Equivalent
17 – 20	141	90.97%	Outstanding
13 – 16	14	9.03%	Very Satisfactory
9 – 12	0	0	Satisfactory
5 – 8	0	0	Fairly Satisfactory
0 - 4	0	0	Poor
Mean Score	18.06		
SD	1.48		
Descriptive Equivalent	Outstanding		

Table 11 presents the outcome regarding the level of students' practical application in terms of network services configuration. The activity yielded an overall weighted mean of 18.06, with a standard deviation of 1.48, which can be verbally interpreted as outstanding. The findings revealed that students were able to follow the standard safety protocols and guidelines and how to correctly configure IP addresses, navigate sharing settings and ensuring network connectivity, and establishing internet functionality. Also, students successfully set up a computer network and share access in a peer-to-peer network system. Furthermore, students performed the activity in an organized, structured, well-managed and complete process of network service configuration.

Table 12. Level of Students' Practical Learning Application in terms of Computer Hardware and Software Repair

Score	Frequency	Percentage	Verbal Interpretation
17 – 20	142	91.61%	Outstanding
13 – 16	13	8.39%	Very Satisfactory
9 – 12	0	0	Satisfactory
5 – 8	0	0	Fairly Satisfactory
0 – 4	0	0	Poor
Mean Score	18.75		
SD	1.45		
Descriptive Value	Outstanding		

Table 12 shows the level of students' practical learning application in terms of hardware and software repair. The activity attained a high concentration of student scores, resulting in an overall mean score of 18.75 and a standard deviation of 1.45, indicating that the abilities were highly applied. It implies that students were observed to prepare the necessary materials and tools while following standard safety guidelines and precautions. Moreover, students applied the appropriate steps in defragmenting computer hard drives correctly and independently. Moreover, they can accurately interpret the recorded results before and after the defragmentation process. Then, students also fostered collaboration, teamwork, and responsibility throughout the activity.

Significant Relationship between Teaching Computer Systems Servicing Competencies and Students' Skills Development

In this study, the significant relationship between teaching Computer Systems Servicing (CSS) competencies and students' skills development was analyzed by applying Pearson Correlation Coefficient using Minitab 14.

Table 13. Significant Relationship between Teaching Computer Systems Servicing Competencies and Students' Skills Development

Computer Systems Servicing Competencies	Pearson Correlation	Students' Skills Development			
		Technical Skills	Cognitive Skills	Problem-Solving Skills	Decision-Making Skills
Installing and Configuration of Computer Systems	Pearson Correlation	.819**	.745**	.775**	.973**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	155	155	155	155
Setting up Computer Networks	Pearson Correlation	.794**	.760**	.745**	.822**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	155	155	155	155
Setting up Computer Servers	Pearson Correlation	.791**	.763**	.714**	.806**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	155	155	155	155
Maintaining and repairing computer systems	Pearson Correlation	.748**	.767**	.710**	.836**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	155	155	155	155

Note * p < .05

Table 13 presents the correlation between teaching computer systems servicing competencies and students' skills development.

A significant correlation between teaching computer systems servicing competencies and students' skills development was found, indicating that teachers' competence in install and configuring computer systems, setting up computer networks, setting up computer servers, and maintaining and repairing computer systems helps students develop their technical skills, cognitive skills, problem-solving skills, and decision-making skills. This implies further that strong teacher competence leads to more meaningful hands-on learning experiences among students. Likewise, improvement and sustained teachers' competencies in Computer Systems Servicing is meaningful as it directly contributes to producing students who are more skilled, problem solvers, and capable of making informed decisions in real-world settings.

Regression Analysis on the Effect of Teaching Computer Systems Servicing Competencies on Students' Practical Learning Application

In this study, the significant effect of teaching computer systems servicing competencies on students' practical learning application were analyzed employing Regression Analysis using Minitab 14.

Table 14. Regression Analysis on the Effect of Teaching Computer Systems Servicing Competencies on Students' Practical Learning Application ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	15.62	4	3.91	38.45	0.000*
Residual	14.18	151	0.10		
Total	29.90	155			

a. Dependent Variable: Practical Learning Application

b. Predictors: Installing and Configuration of Computer Systems; Setting up Computer Networks; Setting up Computer Server; Maintaining and repairing computer system

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1	(Constant)	1.25	0.30		04.120.000
	Installing and Configuration of Computer Systems	0.28	0.070.32		3.85 0.000*
	Setting up Computer Networks	0.24	0.070.29		3.42 0.001*
	Setting up Computer Server	0.19	0.060.21		2.28 0.003*
	Maintaining and repairing computer system	0.31	0.070.35		4.21 0.000*

Table 14 exhibits the effect of teaching computer systems servicing competencies on students' practical learning application. The results include beta coefficients, f-value, t-values, and p-values for each analysis.

The regression coefficients indicate that all indicators of Teaching Computer Systems Servicing Competencies such as Installing and Configuration of Computer Systems, Setting up Computer Networks, Setting up Computer Server, and Maintaining and repairing computer system significantly influence students' Practical Learning Application. It indicated

that each independent variable significantly contributes to the students' application of practical learning.

The results indicates that strong technical knowledge, teaching skills, and demonstrate proper procedures were able to teach clearly and accurately is important for a teacher to become competent. Their competent level allows them to explain difficult concepts in simple ways, such as providing relevant demonstrations, and assist students while performing hands-on activities. As a result, students developed a deeper understanding of computer system servicing principles and gain confidence in performing tasks such as installing hardware, troubleshooting systems, configuring networks, and maintaining computer equipment.

IV. CONCLUSION AND RECOMMENDATIONS

The teaching of CSS competencies has a significant relationship with the students' skills that results to the rejection of null hypothesis. This concludes that teachers who are well-equipped and competent in delivering CSS competencies, particularly in installing and configuring computer systems, setting up computer networks, setting up computer servers, and maintaining and repairing computer systems, play a significant role in enhancing students' skills.

The Computer Systems Servicing competencies show a significant effect on students' practical learning application, with maintaining and repairing computer systems demonstrating the largest unique contribution, followed by setting up computer networks and setting up computer servers, leading to the rejection of the null hypothesis. This concludes that teachers' competence in supervising students through relevant and effective hands-on activities enhances students' practical learning application of CSS competencies.

Based on the formulated conclusion, the researcher suggested several recommendations below:

To ensure quality and improve teachers' competence in delivering Computer Systems Servicing (CSS) lessons particularly in terms of Setting up computer server, teachers may obtain National Certification II (NC II) from TESDA along with Trainers Methodology Level 1 as a minimum requirement. The NC II and TM I certification may improve teachers' competence to perform and deliver industry-standard skills in teaching the learners the proper server installation, operating systems configuration, user access control, also to integrate updated hands-on expertise in assisting the students in practical activities.

To enhance and improve students problem-solving skills, instructors may undergo in a periodic competency evaluation and assessment by TESDA-trained assessors to ensure that their instructions and activities being used in their teaching remains aligned with National Training Regulations and

current industry standards. Through assessors' evaluation and feedbacks, they can integrate updated hand-on and problem-based activities requiring students to analyze, troubleshoot, resolve problems, and look for justifying solutions in real-world scenarios in the field and industry of Computer Systems Servicing.

Teachers may further improve the Grade 10 students practical learning application specifically in Network Services Configuration through collaboration of School administrators and ICT program coordinators with TESDA trainers and accredited Technical-Vocational Institutions (TVIs) to conduct performance-based assessments within the school, seminar, early exposure of learners, and practical workshops in the industry in terms of network service configuration including server role installation, IP address management, domain setups, and system monitoring in the real workplace workflows and standards. These initiatives can promote students' strong technical proficiency and practical learning application in performing network services configuration tasks align with the industry professional workflows and standards.

Future researchers can use the findings of this study to further explore the influence of teaching CSS competencies in learners fosters students' skills development and practical learning application. This can include teachers' evaluation and periodic assessments from recognized evaluators and trainers to ensure quality of CSS teaching. Additionally, allowing the schools and ICT coordinators to collaborate with accredited institutions to conduct workshops and performance-based programs to develop students' skills and practical learning application to align in the industry standards.

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