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# Use Of Learning Management System (Moodle) To Enhance The Performance And Engagement In Computer Systems Servicing Ncii Of Grade 12 Students

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## Abstract:

This study explores the use of the Learning Management System (LMS), specifically Moodle, in enhancing the performance and engagement of Grade 12 students in Computer Systems Servicing NC II. The study examines four key Learning Management System variables, Accessibility, Active Engagement, Advocacy for Inclusion, and Accountability, and their relationship with student engagement dimensions: behavioral, emotional, and cognitive.

Utilizing a pretest and posttest design, the research findings indicate a significant improvement in students' performance when exposed to Moodle, leading to the rejection of the null hypothesis. Furthermore, the study establishes a significant relationship between Learning Management System (LMS) variables and students' performance tasks. Additionally, perceived Learning Management variables are found to be significantly related to the level of student engagement.

Based on these findings, the researcher recommends improving accessibility by enhancing internet connectivity and mobile-friendly interfaces, integrating interactive elements such as gamification and discussion forums to boost engagement, and conducting training sessions for both educators and students to maximize the platform's effectiveness. These insights suggest that Moodle can serve as a powerful tool for fostering better learning outcomes and engagement in Computer Systems Servicing NCII.

Keywords: Moodle, Learning Management System, student performance, student engagement, Computer Systems Servicing, NCII

# 1. Introduction

In recent years, educational institutions have increasingly turned to digital technologies to enhance teaching and learning processes. The integration of Learning Management Systems (LMS) has become a crucial aspect of modern education, providing platforms that support both instructors and students in various ways. Among these, Moodle stands out as a versatile and widely used LMS, known for its user-friendly interface and comprehensive features that facilitate online learning, assessment, and communication.

As education shifts towards a more technology-driven approach, it is essential to explore how these systems can address specific challenges within educational settings. One of the significant areas of concern is the engagement and performance of students, particularly in technical, vocational, and livelihood subjects where practical skills are paramount. The effective use of LMS like Moodle has the potential to create interactive learning environments that can foster student motivation, enhance skill acquisition, and ultimately improve academic outcomes.

At Paiisa National High School, the Computer Systems Servicing NCII strand for Grade 12 students has faced challenges in student performance and engagement. The average mean percentage score (MPS) for the school year 2023-2024 is alarmingly low at 52.32, significantly below the school's overall average MPS of 68.32 (SMEPA 2024). This disparity raises concerns about the effectiveness of current teaching methods and the level of student engagement in the Computer Systems Servicing subject.

Low performance in TVL subjects like Computer Systems Servicing can have long-term implications for students, including diminished confidence in their skills, reduced career readiness, and limited opportunities for further education. It is critical to identify the underlying factors contributing to this low performance. Factors may include traditional teaching methodologies, lack of interactive learning experiences, limited access to resources, and insufficient student engagement.

To address this issue, the proposed study will explore the implementation of Moodle as an LMS to enhance the performance and engagement of Grade 12 students in Computer Systems Servicing. By leveraging the features of Moodle—such as interactive content, forums, quizzes, and tracking mechanisms—this study aims to create a more engaging and effective learning environment.

This research will investigate how Moodle can facilitate better understanding of complex concepts in Computer Systems Servicing, promote collaboration among students, and provide instructors with valuable insights into student progress. Additionally, the study will analyze whether the integration of Moodle can lead to improved academic performance, as evidenced by an increase in MPS from the current 52.32 to a more satisfactory level.



Figure 1: Research Framework

# 2. Research Problem

The study aimed to determine the use of the Learning Management System (LMS) on the performance and engagement among Grade 12 students of Paiisa National High School. Specifically, this study sought to answer the following questions:

- 1. What is profile of respondents in terms of:
- 1.1 Age;
- 1.2 Sex;
- 1.3 Family monthly income;
- 1.4 Parents educational attainment;
- 1.5 Parents occupation;
- 1.6 Types of gadgets available, and;
- 1.7 Availability of Internet connection?

2. What is the mean perception of the respondents on the elements of Learning Management System (Moodle) in terms of:

- 2.1 Accessibility;
- 2.2 Active engagement;
- 2.3 Advocacy for inclusion; and,
- 2.4 Accountability?

3. What is the mean pretest score and post-test score of the respondents before and after exposing them to the Learning Management System (Moodle)?

- 4. What is the performance task score of the respondents after exposing them to the Learning Management System (Moodle)?
- 5. What is the level of student engagement as to:
- 5.1 Behavioral;
- 5.2 Emotional, and;
- 5.3 Cognitive?

6. Is there a significant difference between the mean pre-test scores and post-test scores of respondents when exposed to the Learning Management System(Moodle)?

7. Is there a significant relationship between the perception of the respondents in the Learning Management System (LMS) and performance tasks?

8. Is there a significant relationship between the perception of respondents towards the Learning Management System and the level of student engagement?

### 3. Materials and Methods

The research employed quantitative research design, specifically a quasi-experimental design. Quasi-experimental research involves the manipulation of an experimental group without the random assignment of participants to conditions or orders of conditions. For these reasons, quasi-experimental research is generally higher in internal validity than correlation studies but lower than true experiments.

Pre-test and post-test scores were the main sources of the data. The researcher will also use the gain scores of the respondents to determine the effectiveness of the learning management system.

The population in the study was composed of forty-six (46) grade 12 students enrolled under the Computer Systems Servicing NC II strand at Paiisa National High School where the researcher was currently teaching and handling computer system servicing ncii subject. Paiisa National High School is a public school in Brgy. Paiisa, Tiaong, Quezon caters to students from grades seven to twelve in Tiaong, Quezon in Calabarzon (Region IV-A). A total of 50 grade 12 students were enrolled in the TVL-ICT track.

A thirty-item multiple-choice pre-test and post-test were constructed and utilized to achieve the objectives of the study. This instrument is designed to assess the performance of selected Grade 12 students at Paisa National High School. The draft of the survey instrument was presented to the members of the panel for corrections, recommendations, and suggestions.

The pre-test and post-test were analyzed by the researcher's school head and master teachers. The Pre-test will be given before the use of the learning management system, and the Post-test after the allotted period of using the learning management system.

A survey questionnaire was constructed and utilized to achieve the objectives of the study. In terms of construction, a three-part questionnaire will be developed. Part I describes the respondents' profiles. Part II dwells on the perception of the respondents in the learning management system. Part III identifies the level of students' student engagement.

For validation and organization, the survey questionnaire was presented to the committee composed of experts for content validity and sequential organization of the instrument.

The study was conducted in three phases: planning, implementation, and data retrieval. In the planning phase, the researcher reviewed related literature on learning management systems and student engagement, sought approval from the school division superintendent and principal, and developed the research instruments, including the survey, pre-test, and post-test questionnaires, which experts and the adviser later validated. The implementation phase involved administering the survey to the respondents and evaluating their engagement and perceptions of the learning management system. Finally, in the data retrieval phase, the researcher gathered and organized the data, conducted statistical analysis, and interpreted the results about the research hypotheses and existing studies, leading to the formulation of conclusions and recommendations.

To facilitate the implementation of the Learning Management System (LMS), the researcher signed up for a trial version of Moodle, which supports up to 100 users. While the trial version imposed a limit on the number of enrollees, it retained all the essential features available in the premium account, with the only distinction being the user capacity. The researcher utilized this platform to develop and organize learning materials, including lessons, performance tasks, and interactive quizzes aligned with the curriculum. After setting up the content, Grade 12 TVL (Technical-Vocational-Livelihood) learners were enrolled into the system. The LMS link was then distributed to the students, with instructions to log in, explore the provided modules, and complete the activities. To ensure engagement and track learner progress, the researcher conducted regular monitoring throughout the implementation phase, providing support as needed and recording data on student participation and performance.

# 4. Result and Discussions

#### **Profile of the Respondents**

The table and interpretation below are related to the profile of the respondents.

Table 1. Profile of the Respondents in terms of Gender and Age.					
Profile	Frequency	Percentage			
Gender					
Male	31	67.39			
Female	15	32.61			
Age in years					
17	42	91.30			
18	4	8.70			
19	-				
20	-				

Table 1 presents that most respondents are male, with a frequency of 31 or 67.39%, while female respondents account for 15 or 32.61% of the total population. In terms of age distribution, the data reveal that most of the respondents, specifically 42 or 91.30%, are 17 years old, while only 4 respondents or 8.70% are 18 years old and there are no respondents recorded who are 19 or 20 years old.

The table below shows that most respondents come from families earning below P8,000 monthly (39.13%), followed by those earning P15,001-30,000 (28.26%). Only a few families earn P30,001 and above. Regarding the educational attainment of parents, half of the fathers (50%) and the majority of mothers (58.70%) are high school graduates. A smaller percentage of parents have reached college level, with only 4.35% of fathers and 6.52% of mothers completing college. In terms of occupation, 47.83% of fathers and 43.48% of mothers are employed, while 28.26% of both are self-employed. A notable

portion of parents are unemployed—23.91% of fathers and 28.26% of mothers. These findings indicate that most respondents come from low-income families with parents who have limited formal education and varied employment status.

Table 2. Profile of t	he Respondent in ter	ms of Family Incom	e, Educational Attainment	of Parents, and Paren	it's Occupation
			/	/	

Profile	Frequency		Percentage	
Family Monthly Income				
Below 8,000	18		39.13	
8,001-15,000	11		23.91	
15,001-30,000	13		28.26	
30,001-50,000	2		4.35	
Above 50,000	2		4.35	
Education Attainment of Parents				
	Father		Mother	
	Frequency	Percentage	Frequency	Percentage
Elementary undergraduate	6	13.04	1	2.17
Elementary graduate	8	17.39	4	8.70
High School undergraduate	7	15.22	7	15.22
High School graduate	23	50.00	27	58.70
College undergraduate	-	-	3	6.52
College graduate	2	4.35	4	8.70
Parent's Occupation				
	Father		Mother	
	Frequency	Percentage	Frequency	Percentage
Employed	22	47.83	20	43.48
Unemployed	11	23.91	13	28.26
Self-employed	13	28.26	13	28.26

# Table 3. Profile of the Respondents in terms of Types of Gadgets Available at Home and Availability of Internet Connection

Profile	Frequency	Percentage			
Types of Gadgets Available at Home					
	Frequency	Percentage			
Laptop	-	-			
Tablet	1	2.17			
Desktop	-	-			
Smartphone	46	100.00			
Availability of Internet Connection					
	Frequency	Percentage			
Yes	27	58.70			
No	19	41.30			

Table 3 reveals that most of the respondents (100%) reported having a smartphone at home, making it the most accessible device among participants. In contrast, access to other types of gadgets is significantly limited. Only one respondent (2.17%) reported having a tablet, while none reported having a laptop or desktop computer.

Regarding internet connectivity, the table shows that 27 respondents (58.70%) have access to an internet connection at home, while 19 respondents (41.30%) do not. This indicates that although a majority of the respondents have internet access, a substantial proportion still lack connectivity, which may affect their ability to participate in online or digital activities effectively.

These findings suggest that while smartphones are widely accessible, the lack of other digital devices and limited internet access could pose challenges in contexts such as remote learning, digital communication, or access to online resources.

#### Perception of the Respondents on Learning Management System (Moodle)

The following tables and interpretations are related to the objective of determining the respondents' perception on several variables collectively related to the Learning Management System (Moodle).

Table 4. Perception of the Respondents on Accessibility					
Statemer	nt	Mean	SD	Verbal Interpretation	
The Lear	ning Management system				
1.	materials are available in multiple formats(e.g.,	4.20	0.96	Agree	
PDF, Wo	ord, HTML)				
2.	can be accessed on a variety of devices (e.g.,	4 27	0.00	Strongly Agroo	
phone, ta	blet, laptop, desktop)	4.37	0.90	Subligiy Agree	
3.	users can engage with the content without a	4 15	1.07	٨ ٥٣٩٩	
mouse (e	.g., using a keyboard or touchscreen)	4.15	1.07	Agree	
4.	supports vision/hearing challenges (e.g.,				
alternativ	re text for images, captions for video, sign language	4.17	0.93	Agree	
interpreta	tion, transcripts)				
5.	materials are in simple contrasting colors.	4.04	1.05	Agree	
6.	diagrams and images are supported with text				
	8 8 11	4.24	0.79	Strongly Agree	
7.	figures and tables are formatted for accessibility.				
		4.23	0.81	Strongly Agree	
Overall		4.23	0.64	Strongly Agree	

#### Legend:

4.21-5.00 Strongly Agree(SA) 3.41-4.20 Agree(A) 2.61-3.40 Moderately Agree(MA) 1.81-2.60 Disagree(D) 1.00-1.80 Strongly Disagree(SD)

Table 4 illustrates the respondents' perceptions of the accessibility features of the Learning Management System (LMS). The overall mean of 4.23, interpreted as "Strongly Agree," suggests that the LMS is generally perceived as accessible by the respondents. Among the specific accessibility features evaluated, the highest-rated statement was the LMS's ability to be accessed on a variety of devices, such as phones, tablets, laptops, and desktops (Mean = 4.37, Strongly Agree). This finding indicates that respondents highly value the system's flexibility in allowing access across multiple platforms, which enhances user convenience and inclusiveness. Additionally, strong agreement was also observed regarding the support for diagrams and images with accompanying text (Mean = 4.24, Strongly Agree) and the formatting of figures and tables for accessibility (Mean = 4.23, Strongly Agree), emphasizing the system's use in presenting instructional materials in an accessible manner.

Meanwhile, other accessibility aspects, such as the availability of materials in multiple formats (Mean = 4.20, Agree) and the ability to engage with content without a mouse (Mean = 4.15, Agree), were also rated positively, suggesting that the LMS provides a variety of learning resources and interaction methods that accommodate different user needs. Furthermore, the system's support for vision and hearing challenges, such as alternative text for images, captions for videos, and sign language interpretation, received a mean score of 4.17, indicating agreement among respondents that the LMS considers accessibility for individuals with disabilities. However, the lowest-rated aspect was the use of simple contrasting colors (Mean = 4.04, Agree), which, while still perceived as accessible, suggests that there may be areas for improvement in ensuring that visual elements are optimized for readability and clarity.

Overall, the findings indicate that the LMS is generally accessible, with certain features receiving stronger agreement than others. While respondents appreciate the LMS's accessibility in terms of device compatibility, multimedia support, and formatting, minor enhancements could be made to improve contrast and support for users with specific disabilities. Addressing these aspects could further enhance the inclusiveness of the LMS and ensure that it meets the diverse needs of all learners.

	Table 5. Perception of the Respondents on Active Engagement						
Statement		Mean	SD	Verbal Interpretation			
The conten 1.	t of Learning Management system have subject matter that are appropriately challenging for me	4.35	0.74	Strongly Agree			
2.	promotes multiple and complex responses	4.13	0.81	Agree			
3. simulations	leverages known cognitive stretegies such as work examples, or s.	4.20	0.72	Agree			
4.	uses interactive activities like quizzes and performance tasks	4.37	0.77	Strongly Agree			
5. teacher and	provides me with opportunities for meaningful interaction with peers to promote higher order of thinking skills	4.35	0.67	Strongly Agree			
6.	facilitates regular feedback on my participation and progress	4.28	0.69	Strongly Agree			
7. forums	supports our collaborative learning through group projects and	4.54	0.81	Strongly Agree			
Overall		4.32	0.46	Strongly Agree			

Legend: 4.21-5.00 Strongly Agree(SA) 3.41-4.20 Agree(A) 2.61-3.40 Moderately Agree(MA) 1.81-2.60 Disagree(D) 1.00-1.80 Strongly Disagree(SD

The data presented in Table 5 highlights the respondents' perceptions of how the Learning Management System (LMS) facilitates active engagement in the learning process. The overall mean score of 4.32, interpreted as "Strongly Agree," suggests that respondents generally perceive the LMS as highly engaging. Among the specific aspects assessed, the highest-rated feature was the LMS's ability to support collaborative learning through group projects and forums (Mean = 4.54, Strongly Agree). This finding aligns with the study by Hrastinski (2009), which emphasizes that online discussions and group work significantly enhance student engagement, allowing for deeper learning and peer interaction. Similarly, the strong agreement on the use of interactive activities like quizzes and performance tasks (Mean = 4.37, Strongly Agree) further supports the importance of active learning strategies in digital education. Research by Cheng and Chau (2016) highlights that interactive elements in an LMS, such as gamified quizzes and simulations, contribute to improved student motivation and participation.

Additionally, respondents strongly agreed that the LMS provides subject matter that is appropriately challenging (Mean = 4.35, Strongly Agree) and offers opportunities for meaningful interaction with teachers and peers to promote higher-order thinking skills (Mean = 4.35, Strongly Agree). These findings resonate with Vygotsky's (1978) social constructivist theory, which suggests that meaningful learning occurs through collaboration and interaction with more knowledgeable peers or instructors. The LMS appears to support this by facilitating discussions and engagement with complex ideas, as indicated by the high rating of its ability to leverage cognitive strategies such as work examples and simulations (Mean = 4.20, Agree). This aligns with Mayer's (2005) Cognitive Theory of Multimedia Learning, which suggests that well-designed instructional materials, including worked examples and simulations, enhance knowledge retention and problem-solving skills.

Furthermore, the LMS was also rated highly for its role in facilitating regular feedback on student progress (Mean = 4.28, Strongly Agree), which is a crucial factor in student engagement. According to Hattie and Timperley (2007), effective feedback not only enhances learning but also fosters student motivation by helping learners track their progress and identify areas for improvement. Meanwhile, the LMS's capacity to promote multiple and complex responses (Mean = 4.13, Agree) was slightly lower than other aspects, indicating that while the system encourages diverse responses, there might be room for improvement in fostering deeper engagement with open-ended tasks.

	Table 6 Perception of the Respondents on Advocacy for Inclusions						
Statement		Mean	SD	Verbal Interpretation			
The conter	nt of Learning Management system						
1.	uses socially inclusive language (e.g., chairperson)	4.33	0.67	Strongly Agree			
2.	is designed to be accessible to users with diverse abilities and needs.	4.15	0.73	Agree			
<ol> <li>various gro</li> </ol>	acknowledges injustices – historical and contemporary – against oups, including direct confrontation and stereotypes.	4.39	0.68	Strongly Agree			
4. readers, ke	provides features that accommodate users with disabilities (e.g., screen syboard navigation).	4.35	0.60	Strongly Agree			
5. and needs.	offers customizable setting to support individual learning preferences	4.37	0.93	Strongly Agree			
6. varied asso	promotes inclusive practices by allowing for flexible deadlines and essment methods	4.46	0.66	Strongly Agree			
7. its features	provides support for users who need assistance with accessing or using	4.33	0.76	Strongly Agree			
Overall		4.32	0.46	Strongly Agree			

Legend: 4.21-5.00 Strongly Agree(SA) 3.41-4.20 Agree(A) 2.61-3.40 Moderately Agree(MA) 1.81-2.60 Disagree(D) 1.00-1.80 Strongly Disagree(SD)

Table 6 presents the respondents' perception of advocacy for inclusions in a Learning Management System (LMS). The overall mean score of 4.32 indicates a strong agreement that the LMS promotes inclusivity.

Among the statements, the highest-rated factor was "Promotes inclusive practices by allowing for flexible deadlines and varied assessment methods" (Mean = 4.46). This item received the highest rating because the LMS includes features that allow the researcher to set flexible deadlines for student submissions and to choose from a variety of assessment formats, such as quizzes, assignments, and discussion forums, which cater to different learning styles and paces. These functionalities support the creation of a more inclusive learning environment, enabling students to engage with the content in ways that suit their individual needs and circumstances.

On the other hand, the statement "Is designed to be accessible to users with diverse abilities and needs" had the lowest mean (4.15), interpreted as Agree rather than Strongly Agree. This could indicate that while accessibility is present, there may still be room for improvement in ensuring that all users, especially those with disabilities, can fully utilize the LMS. Al-Azawei et al. (2017) found that LMS adoption often lacks complete accessibility features, which can hinder students with disabilities.

The presence of features that accommodate users with disabilities (Mean = 4.35) and customizable settings for individual learning needs (Mean = 4.37) further highlight the LMS's positive contribution to inclusivity. These findings align with Burgstahler (2015), who emphasized the importance of universal design in education to ensure equal access to learning resources.

	Table 7. Ferception of the Respondents on Accountability						
Statement		Mean	SD	Verbal Interpretation			
The conter	nt of Learning Management system	4.12	0.75	A 2002			
1.	reveals affiliation, sponsors, and authors	4.15	0.75	Agree			
2.	materials explicitly share underlying values, goals, and/or principles	4.57	0.54	Strongly Agree			
3.	does not reveal the personal information that will be collected and how it will be used.	4.48	0.62	Strongly Agree			
4.	includes features for monitoring and documenting academic integrity, such as plagiarism	4 46	0.69	Strongly Agree			
detection to	ools	1.10	0.09	Subligity Agree			
5.	provides transparent communication channels for addressing issues related to academic	1 19	0.62	Strongly Agroo			
accountabi	lity	4.40	0.02	Subligly Agree			
6.	supports accountability by providing audit trails of user actions and system changes	4.22	0.70	Strongly Agree			
7.	provides detailed reports on student progress and performance.	4.52	0.69	Strongly Agree			
Overall		4.41	0.37	Strongly Agree			

Legend: 4.21-5.00 Strongly Agree(SA) 3.41-4.20 Agree(A) 2.61-3.40 Moderately Agree(MA) 1.81-2.60 Disagree(D) 1.00-1.80 Strongly Disagree(SD

Table 7 presents respondents' perceptions of accountability in a Learning Management System (LMS). The overall mean score of 4.41 (SD = 0.37) suggests that respondents strongly agree that the LMS supports accountability in academic settings.

Among the statements, the highest-rated feature is "Materials explicitly share underlying values, goals, and/or principles" (Mean = 4.57). This indicates that respondents appreciate transparency in course content, aligning with Sun & Chen (2016), who emphasized that well-structured and transparent elearning materials enhance student engagement and trust.

Another critical aspect is academic integrity, where features such as plagiarism detection tools (Mean = 4.46) and transparent communication channels for academic accountability (Mean = 4.48) are rated highly. These findings are consistent with Alzahrani (2019), who highlighted that plagiarism detection software enhances academic integrity in online learning environments.

The lowest-rated statement, "Reveals affiliation, sponsors, and authors" (Mean = 4.13), suggests that while the LMS provides transparency, there may still be gaps in clearly identifying course material sources. This aligns with concerns raised by Veletsianos & Shepherdson (2016), who noted that online learning platforms often lack comprehensive source attribution, which can affect credibility.

Table 8. Data Summary on the Perception of the Respondents in the Learning Management System (LMS)						
Mean	SD	Verbal Interpretation				
4.23	0.64	Strongly Agree				
4.32	0.46	Strongly Agree				
4.32	0.46	Strongly Agree				
4.31	0.37	Strongly Agree				
4.30	0.48	Strongly Agree				
	n of the Respondent Mean 4.23 4.32 4.32 4.32 4.31 4.30	Mean         SD           4.23         0.64           4.32         0.46           4.32         0.46           4.31         0.37           4.30         0.48				

Legend: 4.21-5.00 Strongly Agree(SA) 3.41-4.20 Agree(A) 2.61-3.40 Moderately Agree(MA) 1.81-2.60 Disagree(D) 1.00-1.80 Strongly Disagree(SD)

Table 8 presents the summarized data on the perception of respondents regarding the Learning Management System (LMS) based on four key dimensions: Accessibility, Active Engagement, Advocacy for Inclusion, and Accountability. The overall mean score for the LMS was 4.30 with a standard deviation of 0.48, which corresponds to a "Strongly Agree" verbal interpretation. This suggests a highly favorable perception of the LMS among respondents.

Among the four dimensions, Active Engagement and Advocacy for Inclusion received the highest mean scores (4.32), indicating that respondents strongly agree that the LMS effectively facilitates student engagement and promotes inclusivity in the learning process. Accountability also scored high (4.31), reflecting the LMS's ability to support monitoring and responsibility in academic activities. Meanwhile, Accessibility had the lowest mean (4.23) but still fell within the "Strongly Agree" category, signifying that respondents generally find the LMS easy to access.

These findings are encouraging, particularly in modern education, where digital platforms are becoming central to instruction and learning. The high ratings in Active Engagement and Advocacy for Inclusion highlight the LMS's potential to create an interactive and equitable learning environment, an essential feature especially in diverse classrooms. It is also reassuring to see that Accountability is highly rated, as it shows that the LMS is not only a content delivery tool but also a mechanism for tracking progress and ensuring responsibility among students

Table 9. Pre-test and Post-test score of the respondents						
D	Pre-test		Post-test		<b>W I I I I I I I I I I</b>	
Kange	fre.	%	fre.	%	Verbal Interpretation	
24 - 30	-	-	16	35%	Outstanding	
18 - 23	6	13%	24	52%	Very Satisfactory	
12 – 17	30	65%	6	13%	Satisfactory	
6 - 11	10	22%	-	-	Fair	
0 - 5	-	-	-	-	Need Improvement	
Total	46	100%	46	100%		

#### Pre-test and Post-test scores of respondents.

Table 9 relates to the respondents' pre-test and post-test scores when exposed to the learning management system.

The table below presents the pre-test and post-test scores of respondents, highlighting their improvement after exposing them to the Learning Management System (LMS). In the pre-test, the majority (65%) of respondents scored within the 12–17 range, categorized as "Satisfactory," while no respondents achieved an "Outstanding" score (24–30 range). However, post-test results reveal a significant shift, with 35% of respondents attaining "Outstanding" and 52% reaching "Very Satisfactory" (18–23 range).

This suggests that the intervention positively influenced students' learning outcomes because of the LMS's ability to provide personalized learning experiences, immediate feedback, and a variety of multimedia resources that cater to different learning styles. Through structured modules, quizzes, and interactive content, students were able to revisit complex concepts at their own pace, leading to better understanding and retention of knowledge. The flexibility and accessibility offered by the LMS likely encouraged continuous learning beyond the traditional classroom setup, resulting in higher posttest performance.

These findings align with studies emphasizing the use of a learning management system (Moodle) to enhance the performance and engagement of students in computer systems servicing NC II. For instance, Clark and Mayer (2016) highlight that interactive digital learning tools enhance student engagement and knowledge retention. Similarly, a study by Means et al. (2013) found that blended learning approaches lead to higher achievement compared to traditional methods. The observed improvement in post-test scores suggests that adopting innovative teaching methodologies, such as Learning Management Systems (LMS), could address low Mean Percentage Scores (MPS) in Computer Systems Servicing (CSS) NCII.

#### Performance task score of the respondents

The table below and its interpretation relate to the performance task score of the respondents.

Table 10. Performance Task Score of the Respondents				
score	fre.	%	Verbal Interpretation	
80 - 100	36	78%	Outstanding	
60 - 79	10	22%	Very Satisfactory	
40 - 59	-	-	Satisfactory	
20 - 39	-	-	Fair	
0 – 19	-	-	Need Improvement	
Total	46	100		

Table 10 presents the performance task scores of the respondents, demonstrating a high level of achievement. A significant majority (78%) scored within the "Outstanding" range (80–100), while the remaining 22% fell under the "Very Satisfactory" category (60–79). Notably, no respondents scored in the "Satisfactory," "Fair," or "Need Improvement" ranges, suggesting that students performed exceptionally well in the given tasks.

These results indicate a strong grasp of the subject matter and the use of the Learning Management System (LMS) in the teaching and learning process by providing structured, interactive, and self-paced activities that mirror real-world applications, thereby reinforcing both theoretical and practical skills. The LMS facilitated immediate feedback, diverse assessment formats, and greater student autonomy, all of which contributed to deeper engagement and mastery of competencies. By allowing students to repeatedly practice tasks, access supplementary resources, and track their progress, the LMS created an environment conducive to achieving high performance in performance-based tasks

These findings align with studies that emphasize the role of performance-based assessments in improving student learning outcomes. According to Wiggins (1998), authentic assessments, such as performance tasks, provide students with opportunities to apply their knowledge in real-world scenarios, enhancing deeper learning and retention. Similarly, Darling-Hammond and Adamson (2014) argue that performance assessments promote higher-order thinking skills and better engagement compared to traditional testing methods. Furthermore, the high achievement levels in this study could be attributed to the implementation of interactive and student-centered learning approaches, which have been shown to enhance motivation and academic performance (Freeman et al., 2014).

#### Level of Student Engagement

The following tables and interpretations are related to the objective of determining the level of student's engagement.

	Table 11. Perceived Level of Student Engagement as to Behavioral						
Statement		Mean	SD	Verbal Interpretation			
In Learning	g Management System I						
1.	Find computer systems servicing NC II subject to be an interesting subject.	4.70	0.55	Strongly Agree			
2.	Am motivated to demonstrate my acquired skills in computer systems servicing NC II	4.57	0.66	Strongly Agree			
3. servicing N	Seek additional resources or help when I have difficulty understanding computer systems	4.43	0.65	Strongly Agree			
4.	Feel confident in my ability to succeed in computer systems servicing NC II	4.46	0.59	Strongly Agree			
5.	Believe that learning computer systems servicing NCII is important for my future goals	4.61	0.58	Strongly Agree			
6.	Take notes and review them regularly for computer systems servicing NC II	4.67	0.60	Strongly Agree			
7. performane	Believe that my participation in computer systems servicing class affects my overall ce	4.63	4.68	Strongly Agree			
Total		4.58	0.37	Strongly Agree			

Legend: 4.21-5.00 Strongly Agree(SA) 3.41-4.20 Agree(A) 2.61-3.40 Moderately Agree(MA) 1.81-2.60 Disagree(D) 1.00-1.80 Strongly Disagree(SD)

Table 11 presents the respondents' level of behavioral engagement in Computer Systems Servicing NC II through the Learning Management System (LMS). The overall mean score of 4.58 with a standard deviation of 0.37 suggests that students "Strongly Agree" with the behavioral engagement statements, indicating a high level of active participation in LMS-based learning.

Among the indicators, the highest mean score (4.70) was observed in the statement "I find Computer Systems Servicing NC II subject to be an interesting subject," implying that students have a strong interest in the subject when engaging with the LMS. This is consistent with the study by Ghazal, Samsudin, and Aldowah (2018), which found that LMS platforms enhance student engagement by making learning more interactive and accessible. Additionally, the study by Al-Fraihat et al. (2020) emphasized that students' perception of an LMS plays a crucial role in determining their motivation and interest in the subject matter.

Similarly, the statement "I take notes and review them regularly for Computer Systems Servicing NC II" received a high mean score (4.67), highlighting the students' proactive approach to learning and retention. This finding aligns with research by Dumford and Miller (2018), which suggests that students who engage in active learning strategies, such as note-taking and self-review, tend to perform better academically when using an LMS.

Other behavioral engagement indicators, such as "I believe that my participation in Computer Systems Servicing class affects my overall performance" (4.63) and "I believe that learning Computer Systems Servicing NCII is important for my future goals" (4.61), further emphasize students' recognition of the subject's significance in their academic and career paths. This supports the findings of Sun and Rueda (2012), who established a positive correlation between student engagement in online learning environments and academic success.

Meanwhile, the lowest mean score (4.43) was recorded in the statement "I seek additional resources or help when I have difficulty understanding Computer Systems Servicing NC II topics." Although still interpreted as "Strongly Agree," this slightly lower value suggests an area where students may require further encouragement or support in utilizing available resources when facing challenges in understanding course content. This is consistent with Broadbent and Poon (2015), who noted that students in online learning environments sometimes struggle with self-regulation and help-seeking behaviors, which can influenced their overall learning experience.

#### Table 12. Perceived Level of Student Engagement as to Emotional

,	Statement		Mean	SD	Verbal Interpretation
	In Learning	Management System I			
	1.	fell excited and interested in attending my computer systems servicing NCII class	4.59	0.58	Strongly Agree
	2.	felt a sense of accomplishment when I demonstrated computer systems servicing	4.65	0.57	Strongly Agree
	ekille				

3.	feel motivated and focused when preparing for computer systems servicing test or	4.61	0.58	Strongly Agree
exams				
4.	am committed to doing my best and learning from any challenges in the computer	4.59	0.65	Strongly Agree
systems se	rvicing NCII			
5.	feel confident in my ability to learn and understand computer systems servicing NCII	4.59	0.58	Strongly Agree
topics				
6.	believe that I can improve my computer systems servicing NCII skills with effort and	4.59	0.58	Strongly Agree
practice				
7.	am motivated to learn more about computer systems servicing NCII because I find it	4.63	0.57	Strongly Agree
rewarding.				
8.	am comfortable asking for help with computer systems servicing NCII when I need it.	4.48	0.78	Strongly Agree
Total		4.59	0.37	Strongly Agree

Legend: 4.21-5.00 Strongly Agree(SA) 3.41-4.20 Agree(A) 2.61-3.40 Moderately Agree(MA) 1.81-2.60 Disagree(D) 1.00-1.80 Strongly Disagree(SD)

Table 12 presents the respondents' level of emotional engagement in Computer Systems Servicing NC II through the Learning Management System (LMS). The overall mean score of 4.59, with a standard deviation of 0.37, suggests that students "Strongly Agree" with the emotional engagement statements. This indicates a positive emotional connection toward learning Computer Systems Servicing (CSS) through the LMS, which plays a crucial role in sustaining motivation, persistence, and academic success.

Among the indicators, the highest mean score (4.65) was observed in the statement "I feel a sense of accomplishment when I demonstrate computer systems servicing skills," highlighting that students derive satisfaction and confidence from successfully applying their knowledge and skills. This aligns with Fredricks, Blumenfeld, and Paris (2004), who emphasized that emotional engagement, particularly feelings of achievement and pride, significantly contributes to students' willingness to participate actively in learning activities. Similarly, Artino (2009) found that positive emotions, such as accomplishment and self-efficacy, enhance students' engagement and persistence in online learning environments.

The statements "I am motivated and focused when preparing for computer systems servicing tests or exams" (4.61) and "I am motivated to learn more about computer systems servicing NCII because I find it rewarding" (4.63) further reinforce that students have a strong intrinsic motivation toward learning. According to Deci & Ryan (2000), intrinsic motivation—driven by interest and personal satisfaction—leads to deeper engagement and better learning outcomes in digital learning environments.

Other statements, such as "I feel confident in my ability to learn and understand computer systems servicing NC II topics" (4.59) and "I believe that I can improve my computer systems servicing NC II skills with effort and practice" (4.59), indicate that students perceive their learning experience as an opportunity for growth and skill development. This supports Bandura's (1997) theory of self-efficacy, which states that learners who believe in their capability to succeed are more likely to engage actively and persist in their academic tasks.

However, the lowest mean score (4.48) was recorded in the statement "I am comfortable asking for help with computer systems servicing NCII when I need it." Although still interpreted as "Strongly Agree," this suggests that some students may hesitate to seek assistance despite their high level of engagement. This finding is consistent with Broadbent and Poon (2015), who observed that students in online learning environments often struggle with help-seeking behaviors, preferring independent learning over seeking external support.

The relatively low standard deviations across all indicators (ranging from 0.37 to 0.78) suggest a high level of agreement among respondents, reinforcing the consistency of their perceptions regarding emotional engagement.

Table 13. Perceived Level of Student Engagement as to Cognitive						
Statemen	ıt	Mean	SD	Verbal Interpretation		
In Learni	ng Management Systems I					
1.	User various problem-solving techniques when working on computer	4.46	0.66	Strongly Agree		
systems s	servicing NCII tasks or projects					
2.	Explore different approaches to solve complex problems in computer	4.50	0.66	Strongly Agree		
systems s	servicing NCII before settling on the best one					
3.	Regularly review and practice my skills in computer systems servicing	4.50	0.72	Strongly Agree		
NCII to r	einforce my understanding					
4.	Actively seek out challenging computer systems servicing NCII task and	4.61	0.61	Strongly Agree		
projects t	to enhance my skills					
5.	Invest significant time and effort into learning and mastering computer	4.65	0.53	Strongly Agree		
systems s	servicing NCII competencies					
6.	Use feedback from assignments and projects to improve my	4.65	0.53	Strongly Agree		
understan	nding and performance in computer systems servicing NCII					

7.	Assess my own understanding in computer systems servicing NCII	4.63	0.61	Strongly Agree
regularly	to ensure I am learning effectively			
Total		4.57	0.36	Strongly Agree

#### Legend:

4.21-5.00 Strongly Agree(SA) 3.41-4.20 Agree(A) 2.61-3.40 Moderately Agree(MA) 1.81-2.60 Disagree(D) 1.00-1.80 Strongly Disagree(SD)

Table 13 presents the level of student engagement in Learning Management Systems (LMS) concerning cognitive aspects. The results indicate that students demonstrate a high level of cognitive engagement, as reflected by the overall mean score of 4.57 with a standard deviation (SD) of 0.36. The "Strongly Agree" interpretation across all items suggests that students actively engage in cognitive processes that enhance their learning and problem-solving abilities in computer systems servicing.

The highest-rated statements (Mean = 4.65) emphasize students' commitment to investing time and effort in mastering competencies and their use of feedback for learning improvement. This aligns with Zimmerman's (2002) self-regulated learning theory, which highlights that learners who actively seek feedback and monitor their progress exhibit greater academic success. Similarly, Butler and Winne (1995) found that feedback plays a critical role in self-regulated learning, reinforcing its importance in LMS-based education.

Additionally, the statement "Actively seek out challenging computer systems servicing tasks and projects to enhance my skills" received a high mean score (4.61), indicating that students willingly engage in challenging cognitive tasks. This is supported by Vygotsky's (1978) concept of the Zone of Proximal Development (ZPD), which emphasizes the role of challenging tasks in fostering cognitive growth. The findings are also consistent with Chi and Wylie (2014), who argue that active learning strategies enhance deep learning and critical thinking skills.

The lowest-rated item, "Use various problem-solving techniques when working on computer systems servicing tasks or projects" (Mean = 4.46), while still interpreted as "Strongly Agree," suggests that students might require additional support in applying diverse problem-solving strategies. This finding aligns with Jonassen (1997), who emphasized that problem-solving in digital learning environments requires scaffolding to improve students' adaptive reasoning skills.

Table 14. Data Summary of Perceived Level of Student Engagement				
Student Engagement	Mean	SD	Verbal Interpretation	
Behavioral	4.58	0.37	Very High	
Emotional	4.59	0.37	Very High	
Cognitive	4.57	0.36	Very High	
Overall	4.58	0.37	Very High	

Legend: 4.21-5.00 Very High(VH) 3.41-4.20 High(H) 2.61-3.40 Moderately High(MH) 1.81-2.60 Low(L) 1.00-1.80 Very Low(VL)

Table 14 summarizes the level of student engagement across behavioral, emotional, and cognitive dimensions within a Learning Management System (LMS). The overall mean score of 4.58 with a standard deviation of 0.37 indicates a high level of engagement, with all dimensions receiving a verbal interpretation of "Very High." This high engagement can be attributed to the LMS's ability to provide an interactive, flexible, and student-centered learning environment that caters to various aspects of student experience. Through features such as discussion forums, instant feedback, multimedia resources, and gamified activities, the LMS effectively stimulated students' participation, nurtured a sense of belonging and interest, and encouraged deep learning strategies. Among the three dimensions, emotional engagement recorded the highest mean (4.59), followed closely by behavioral engagement (4.58, SD = 0.37) and cognitive engagement (4.57). This suggests that students not only actively participate in academic activities but also feel emotionally connected and cognitively invested in their learning experiences. The findings align with the framework of Fredricks, Blumenfeld, and Paris (2004), which defines engagement as a multidimensional construct encompassing behavioral participation, emotional attachment, and cognitive investment. Similarly, Appleton, Christenson, and Furlong (2008) highlighted the role of emotional engagement in fostering persistence and academic success, a factor that is evident in this study.

Additionally, these findings reinforce the importance of designing LMS environments that not only deliver content but also foster emotional connection and intellectual curiosity. The high emotional engagement observed suggests that students are not merely complying with academic tasks but are internally motivated and emotionally invested, a factor that may lead to better long-term retention and academic resilience.

#### Test of Difference Between Pre-test and Post scores of Respondents

	Table 15. Significant Difference Between Pre-test and Post-test scores of Respondents				
	Mean	Std. Deviation	t	df	Sig. (2 tailed)
Pretest	14.28	3.13	17.041	45	0.000
Posttest	21.54	3.32	-17.841	45	0.000

*Legend:* p > 0.05 - not significant. p < 0.05-significant

Table 15 presents the significant difference between the pre-test and post-test scores of students when exposed to the Learning Management System (Moodle). The results show a substantial improvement in student performance, with the mean pre-test score at 14.28 (SD = 3.13) and the mean post-test score at 21.54 (SD = 3.32). The computed t-value of -17.841 with 45 degrees of freedom (df) suggests a significant difference between the two test scores. The p-value (Sig. 2-tailed) of 0.000 is below the standard significance level ( $\alpha = 0.05$ ), indicating that the difference between pre-test and post-test scores is statistically significant.

The significant increase in scores supports the use of LMS-based learning, aligning with studies such as Bernard et al. (2014), which found that online and blended learning environments contribute to improved academic performance. Similarly, Means et al. (2013) reported that LMS-supported instruction enhances student engagement, self-regulation, and retention of knowledge. These findings also resonate with Gagne's (1985) Theory of Instruction, which underscores the importance of structured digital learning experiences in enhancing cognitive development.

Additionally, these findings confirm the use of integrating Moodle into classroom instruction, especially in contexts where learners may benefit from flexible, self-paced, and interactive digital environments. The significant improvement in post-test scores demonstrates that students were not only able to recall and apply more content but were also likely more motivated and engaged due to the LMS's multimedia and formative feedback features. This supports the idea that technology-enhanced learning platforms can bridge gaps in traditional teaching, particularly in resource-constrained or large classroom settings. The data affirm the potential of LMS tools in increasing learning gains and highlight the importance of teacher facilitation in guiding students through digital learning resources

# Test of Relationship Between Perception of the Respondent in the Learning Management System (Moodle) and Performance Task. Table 16. Correlation of Perception of the Respondents in the Learning Management System (Moodle) and the Performance Task.

	Performance Task
Accessibility	.585**
Active Engagement	.457**
Advocacy for Inclusion	.392**
Accountability	.422**

Legend:

\*\*. Correlation is significant at the 0.01 level (2-tailed)

\*. Correlation is significant at the 0.05 level (2-tailed)

Table 16 indicates a significant positive correlation between respondents' perceptions of the Learning Management System (Moodle) and their performance task (PT) outcomes. Among the factors examined, accessibility demonstrated the strongest correlation (r=.585, p<.01r = .585, p<.01r = .457, p<.01r = .392, p<.01r = .422, p<.01r = .42

The results are both statistically significant and practically meaningful. The researcher observed that students are more motivated and perform better when they can easily navigate the LMS, actively participate in discussions, and feel included in a supportive online environment. The strong correlation between accessibility and performance aligns with classroom experiences, where students who face difficulties in accessing digital materials often fall behind. This supports the belief that digital tools must be user-friendly and inclusive to be more effective in enhancing learning outcomes.

These findings align with previous research emphasizing the use of Learning Management Systems (LMS) on student performance and engagement. For instance, a study by Alkhalaf et al. (2012) highlighted that LMS platforms like Moodle enhance accessibility, leading to improved student engagement and learning outcomes. Similarly, research by Martin et al. (2018) found that active participation in online learning environments positively correlates with academic success, supporting the significant correlation found between active engagement (r=.457, p < .01r=.457, p < .01r=.457

Additionally, the findings suggest that the students were more proactive, collaborative, and willing to seek help when the LMS emphasized accountability and inclusion. This insight reinforces the view that the success of online learning is not just about content delivery but about designing experiences that empower, motivate, and emotionally connect learners to their academic journey. Therefore, beyond technical improvements, cultivating a culture of digital empathy and support in LMS design and implementation is essential for maximizing student achievement.

Test of Relationship Between the Perception of the Respondents in the Learning Management System (moodle) and the Level of Student Engagement

	Behavioral	Emotional	Cognitive
Accessibility	.656**	.631**	.443**
Active engagement	.502**	.609**	.494**
Advocacy for inclusion	.758**	.554**	.474**
Accountability	.544**	.618**	.443**

#### Table 17. Correlation of the perception of the respondents in the Learning Management System (moodle) and the Level of Student Engagement

Legend:

\*\*. Correlation is significant at the 0.01 level (2-tailed)

\*. Correlation is significant at the 0.05 level (2-tailed)

Table 17 highlights the significant relationship between students' perceptions of the Learning Management System (moodle), and their level of engagement across behavioral, emotional, and cognitive dimensions. Accessibility demonstrates a moderate to strong correlation with behavioral (r = .656), emotional (r = .631), and cognitive engagement (r = .443), indicating that students who find Moodle easily accessible are more likely to participate actively, feel emotionally connected, and engage in higher-order thinking. This aligns with the findings of Sun & Rueda (2012), who emphasized that accessibility in online learning platforms reduces barriers and fosters consistent participation. Similarly, active engagement within Moodle shows a moderate correlation with behavioral (r = .502), emotional (r = .609), and cognitive engagement (r = .494), suggesting that students who frequently interact with its features, such as forums and quizzes, tend to exhibit higher engagement levels. This is supported by Hew & Cheung (2014), who found that interactive LMS tools significantly enhance student participation and satisfaction.

Among the four factors, advocacy for inclusion shows the highest correlation with behavioral engagement (r = .758), followed by emotional (r = .554) and cognitive engagement (r = .474), indicating that when Moodle is perceived as an inclusive platform accommodating diverse learning needs, students become more engaged. Martin et al. (2020) also found that inclusivity in LMS environments fosters collaborative and participatory learning experiences, leading to enhanced student engagement. Furthermore, accountability exhibits a strong correlation with behavioral (r = .544), emotional (r = .618), and cognitive engagement (r = .443), suggesting that Moodle features promoting student accountability, such as progress tracking and automated feedback, contribute to increased motivation and participation. Broadbent & Poon (2015) similarly emphasized that self-regulated learning tools in LMS platforms improve accountability, thereby enhancing student engagement.

### 5. Conclusions

From the results of the study, the following conclusions are drawn:

1. The data led to the rejection of the null hypothesis and led to the conclusion that there is a significant difference between the pre-test and post-test score of respondents when exposed to the learning management system (moodle).

2. The data led to the rejection of the null hypothesis and led to the conclusion that perceived learning management system variables are significantly related to the performance task.

3. The data led to the rejection of the null hypothesis and prompted the researcher to conclude that perceived learning management variables are significantly related to the level of student engagement.

#### 6. Recommendations

From the conclusions drawn, the following suggestions are offered:

1. Schools may ensure that Moodle is easily accessible by improving internet connectivity, providing mobile-friendly interfaces, and offering training on its use to maximize student participation. Incorporate more interactive elements such as quizzes, discussion forums, gamification, and real-world simulation exercises to improve student engagement across behavioral, emotional, and cognitive dimensions.

2. Provide training sessions for both teachers and students on best practices for utilizing Moodle to enhance learning outcomes and engagement

3. Future studies may explore the long-term effect of Moodle on student performance, compare it with other LMS platforms, or investigate its effects on different subject areas beyond computer systems servicing NC II.

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