CLOUD COMPUTING WEB-BASED LMS: INTERACTIVE LEARNING MEDIA TO ENHANCE STUDENTS' ACCOUNTING PARTICIPATION AND SKILLS

Said Nur Octavianto[1*]
Universitas Negeri Semarang
Sekaran, Gunungpati
Semarang 50229
saidnuroctavianto05@students.unnes.ac.id

Jarot Tri Bowo Santoso[2]
Universitas Negeri Semarang
Sekaran, Gunungpati
Semarang 50229
jarot.tribowo@mail.unnes.ac.id

Sandy Arief[3]
Universitas Negeri Semarang
Sekaran, Gunungpati
Semarang 50229
sandy.arief@mail.unnes.ac.id

Satsya Yoga Baswara[4]
Universitas Negeri Semarang
Sekaran, Gunungpati
Semarang 50229
satsya.yoga.b@mail.unnes.ac.id

ABSTRACT

The need for more competitiveness among high school students can be attributed to the dearth of interactive learning media. This study aims to assess the efficacy of integrating LMS-based Cloud Computing Web Media with a scientific approach to enhance student engagement and accounting proficiency. Adopting a quantitative methodology with a quasi-experimental design, the study employs Class XII IPS 1 (the experimental class) and Class XII IPS 2 (the control class) as the sample set. The data collection techniques and instruments utilized pre-tests and post-tests in the form of HOTS-based multiple choice. The data analysis techniques employed the t-test, which included the Independent Samples t-test and paired Samples t-test, and was supported by the N-Gain Test. This study asserts that LMS-based cloud computing web media integrated with a scientific approach is effective in increasing student participation and accounting skills. Future research may develop LMS-based cloud learning media presented in the form of a website to support online accounting practicum learning.

Keywords: Cloud; LMS; Web; Participation; Skills

ABSTRAK

Daya saing siswa SMA yang rendah disebabkan oleh kurangnya pemanfaatan media pembelajaran interaktif. Penelitian ini berupaya menganalisis efektivitas penggunaan Media Cloud Computing Web berbasis LMS terintegrasi pendekatan saintifik untuk meningkatkan partisipasi dan keterampilan akuntansi siswa. Penelitian ini menggunakan pendekatan kuantitatif dengan metode eksperimen semu (quasi experiment). Sampel yang ditetapkan yaitu Kelas XII IPS 1 (kelas eksperimen) dan Kelas XII IPS 2 (kelas kontrol). Teknik dan instrumen pengumpulan data menggunakan pre test dan post test berupa pilihan ganda berbasis HOTS, sedangkan teknik analisis data menggunakan Uji t yang mencakup Independent Samples t – Test, Paired Samples t – Test, dan didukung oleh Uji N – Gain. Penelitian ini menyatakan Media Cloud Computing Web berbasis LMS terintegrasi pendekatan saintifik efektif untuk meningkatkan partisipasi dan keterampilan akuntansi siswa. Penelitian selanjutnya dapat mengembangkan media pembelajaran Cloud berbasis LMS yang dihadirkan dalam bentuk web (website) untuk menunjang pembelajaran praktikum akuntansi online.

Kata Kunci : Cloud; LMS; Web; Partisipasi; Keterampilan
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*corresponding author

INTRODUCTION

The advent of the Industrial Revolution 4.0 has ushered in a new paradigm and reference point in the general order of human life (Cho, 2018; Lestari & Erwanto, 2021). The human role as the vital driving force has been supplanted by mechanical automation and technological digitization in supporting economic growth (Meliannadya & Mukarramah, 2022). The advent of the Industrial Revolution 4.0 has precipitated a shift in the nature of work, leading to the emergence of new careers and impacting 6.6 million individuals who may be at risk of losing their jobs due to a lack of the requisite skills (Adha, 2020). The advent of new job sectors has also necessitated the acquisition of new competencies (Wagiran et al., 2019). This necessitates that all humans cultivate self-sufficiency by developing mental and technical proficiency to gain a competitive advantage (Marlina, 2021; Wibowo & Arifin, 2015).

The Industrial Revolution 4.0 presents a challenge to high school graduates, who tend to opt for employment over pursuing further education at the college level (Samir et al., 2022; Sinta et al., 2021). The inadequacy of subject matter and competencies required by the industrial world has a detrimental effect on the number of unemployed high school graduates (Laia & Ashar, 2023; T. Yuliana et al., 2020; Zianrini & Utami, 2021). This results in a mismatch of skills needed by the world of work in the Industrial Revolution 4.0 era, which tends to focus on competent and skilled human resources. Consequently, the prospects of low-skilled workers need to be taken into account (Dabla-Norris et al., 2015; Kim & Choi, 2018; Pellizzari & Fichen, 2017). Indicators of learning outcomes in higher education demonstrate that high school graduates tend to possess lower levels of specific essential competencies than their counterparts who have pursued vocational education (Aziz & Indrawati, 2017; Lestari, 2018; Putra, 2019). These findings indicate that high school students exhibit a comparatively limited capacity for academic success when compared to their counterparts who have pursued vocational education.

One of the causes of the low competitiveness of high school students is the lack of utilization of interactive learning media (Endita et al., 2020; Hardiyanti et al., 2023; Hariyanti, 2021; Haryani et al., 2021; Mustamila, 2021; Salshabella et al., 2022; Taena & Karno, 2023). The necessity for the presentation of interactive learning media is reinforced by the rapid evolution of information and communication technology, which has the potential to enhance the efficiency and effectiveness of learning (Choirunissa, 2016; Nova & Widiastuti, 2019; Hartanto, 2016; Hartini et al., 2017; Murtado et al., 2023; Oktasari et al., 2019; Suwarma et al., 2023; Widyaningsih et al., 2020; Zaidi et al., 2021). The integration of technology into learning media has been demonstrated to significantly enhance motivation, interest, and outcomes in learning (Amin, 2019; Fardany & Dewi, 2020; Rahmi et al., 2019). However, Hanjowo et al. (2023) and Widodo et al. (2023) have indicated that teachers are not effectively utilizing this potential to present learning media that align with their needs due to the lack of supporting infrastructure and the limited capacity of teachers to create learning media (Garba et al., 2015; Lestari, 2015; Marzal et al., 2022; Suraweera et al., 2018).

Preliminary analysis indicates that the integration of information and communication technology in Senior High School 14 Semarang is still in its infancy, with a need for more learning media in place. The implementation of learning relies on conventional methods, such as lectures, to explain material in specific subjects. One such subject is the Adjustment Journal of Trading Companies. In the context of economics, both teachers and students have identified the material on adjusting journals and financial statements in trading company accounting as one of the more

challenging and complex topics. The learning difficulties encountered by students at Senior High School 14 Semarang are attributed to the prevailing conventional learning approach and the provision of material handouts comprising monotonous questions. The absence of comprehensive, integrated learning resources that facilitate student engagement, coupled with the lack of clear assessment indicators, impedes the ability of teachers to assess student participation. In light of the pressing nature of these issues, the introduction of interactive learning media is imperative to enhance the quality of teaching and learning activities at Senior High School 14 Semarang.

To address the identified needs related to the complexity of the problems found in Senior High School 14 Semarang, including the low integration of technology in learning, the necessity for "one-stop" learning resources for students, and the requirement for indicators for teachers to assess the level of student participation and activity, it is recommended that the learning process be integrated with internet-based digital learning media. The utilization of digital learning media can facilitate the teaching and learning process within the classroom, support the implementation of the curriculum, provide ease of evaluation and assessment, and serve as a platform for the distribution of learning resources for students (Aslan et al., 2021; Choppin et al., 2022; Machmud et al., 2021; Rasmitadila et al., 2020). The digital learning media required by students in the present era tend to prioritize interactive features, presenting two-way interactions with the objective of increasing student learning motivation (Prahani et al., 2022; Saphira & Prahani, 2022; Syahputra & Maksum, 2020; Tan et al., 2020). The advent of technological transformation and the current era has led to the digitalization of all learning activities, as evidenced by the transition from conventional to digital-based learning in elementary schools (Mardin & Nane, 2020). The integration of digital media into learning environments has been demonstrated to enhance student motivation (Syaparuddin & Elihami, 2019). The success of digital and internet-based learning is contingent upon the competence of the teacher and the active participation of the students in the learning process (Dhawan, 2020; Septianti et al., 2020; Tang et al., 2021).

Cloud computing and web-based learning management systems (LMSs) integrated with a scientific approach can be utilized to support the needs and urgency related to interactive learning media. Zulafwan (2016) posits that the implementation of cloud computing can facilitate the establishment of an adequate learning media platform that students can utilize. Cloud computing facilitates the management, storage, and processing of data based on the Internet (Alhomdy et al., 2021; Arora et al., 2020). The attributes of cloud computing that are particularly noteworthy include suitability for meeting the needs of users, ease of control, dynamic functionality, and scalability that is nearly unlimited (Hartanto, 2017). The integration of Cloud Computing with a Web system (website) results in the creation of a digital repository of information in the form of electronic pages or web pages (Laugi, 2018). In addition, the utilization of an LMS can facilitate students' inquiry processes (Rezvani et al., 2017), enhance the quality of learning interactions (Zainuddin et al., 2019), and ensure high accessibility (Williams & Brown, 2018). LMS provides an online learning space with media content and tools to support the learning climate created by teachers and students (Bradley, 2020; Ferrer & Martínez, 2021; Hazelton et al., 2021; Kehrwald & Parker, 2019; Purba et al., 2022). LMS can serve as a secure and adaptable primary learning platform for students, offering criteria as a tool for assessing student skills, productivity, and communication (Khan et al., 2019; Kraleva et al., 2019). The integration of the scientific approach in the use of LMS-based cloud computing web learning media is able to create a more active and exciting learning atmosphere,

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thereby encouraging students' ability to think creatively, innovatively, and systematically according to the material studied (Setiawan & Wilujeng, 2016; Sodik & Wijaya, 2017). The scientific approach is implemented in five steps: (1) Observation, (2) Questioning, (3) Collection of data or information, (4) Association, and (5) Communication. These steps are designed to improve understanding and suppress student misconceptions about certain materials (Zaim, 2017).

The utilization of LMS-based cloud computing web learning media, employing a scientific approach, is predicated upon the behavioralism learning theory of Edward Lee Thorndike (1874-1949) and the constructivism learning theory of Jean Piaget (1896-1980) and Lev Semyonovich Vygotsky (1896-1934). The law of exercise principle in behaviorism theory is in accordance with the LMS-based Cloud Computing Web media, which provides various case studies and theory exercises with various types and forms of questions in similar material coverage. These exercises are carried out by providing stimuli repeatedly. In addition, the concepts of scaffolding and the Zone of Proximal Development (ZPD) in constructivism theory align with the scientific approach, which emphasizes the concept of problem-based learning (Waseso, 2018). The advantages of the concept of problem-based learning Afsouran et al. (2018) include improvements in long-term memory, decision-making quality, and the capacity to comprehend one another. The method has the potential to foster student interest in learning, enhance student engagement, and improve student learning performance. Additionally, it can serve as a conduit between theoretical and practical learning (Lusoli, 2020; Song et al., 2022).

The objective of this study is to evaluate the efficacy of utilizing LMS-based Cloud Computing Web Learning Media in conjunction with a scientific approach to enhance the participation and accounting competencies of Class XII Social Studies students at Senior High School 14 Semarang. The findings of this study are anticipated to contribute to the existing literature on the use of interactive learning media in the teaching of Trade Company Accounting Adjustment Journal Material at Senior High School 14 Semarang.

METHOD

This study was conducted at Senior High School 14 Semarang using a quantitative approach with an experimental research type implemented through a quasi-experiment method. The quasi-experiment method involves placing the smallest experimental unit into the experimental group and control group without going through a non-random assignment process to establish a cause-and-effect relationship (Aloe et al., 2017; Ballance, 2024). This study categorizes experimental class students as a group that receives a stimulus (treatment) and control class as a group that does not receive a stimulus (treatment) in the smallest unit. The research is deemed successful if there are differences in student participation and accounting skills in the experimental group that are superior to those in the control group. The research design set is listed in Table 1.

The sample in question pertains to the similarity of the characteristics exhibited by each experimental and control class, as determined through the Non-equivalent Control Group Design methodology. The characteristics of the research sample were as follows: (1) Class XII students who had not studied the Trading Company Adjusting Journal Material; (2) Class XII students who had studied the Service Company Adjusting Journal Material; (3) Students in each class were taught by the same teacher;

(4) Students in each class were the same number; and (5) Students in each class had the same average end-of-semester grade. The sample set is listed in Table 2.

Table l. Research Design

Class	Pre Test	Stimulus	Post Test
Experiment	O_1	X_1 (Learning Media and the Scientific Approach)	O_2
Control	O_1	X_2 (Scientific Approach)	O_2

Source: Researcher, processed (2024)

Description:

O_1 = Giving pre-test to experimental class and control class

X_1 = Providing stimulus in the form of learning media and scientific approaches to the experimental class

X_2 = Giving stimulus in the form of a scientific approach to the control class

O_2 = Giving post-tests to experimental and control classes

Table 2. Research Sample

No.	Class	Number of Students	Value	Group
1.	XII IPS 1	34	81	Experiment
2.	XII IPS 2	34	81	Control

Source: School data, processed (2024)

This study employs data collection techniques and instruments in the form of pre and post-tests that pertain to the basis of higher-order thinking skills (HOTS) questions, encompassing types of C4 (analyze), C5 (evaluate), and C6 (create). The multiple-choice format was selected for its ability to accommodate a diverse range of responses and its versatility compared to other question types. The scoring system assigns a value of 1 to the correct answer and 0 to the incorrect response (Putra, 2013; Wijaya, 2016). The data analysis techniques employed include the Independent Samples t-test for the analysis of student participation, the Paired Samples t-test for the analysis of the development of students' accounting skills through indicators of the effectiveness of using LMS-based Cloud Computing Web Learning Media integrated with a scientific approach, and the N-Gain Test for the support of the results of the aforementioned analysis, which is carried out by classifying the improvement of students' accounting skills in each experimental class and control class.

RESULT AND DISCUSSION

The research was conducted on the experimental class (XII IPS 1) and the control class (XII IPS 2); it yielded data on the results of the pre-test and post-test for each class set. The pre-test data from the experimental class is employed to ascertain the initial abilities of students prior to the administration of the stimulus (treatment), which is in the form of LMS-based Cloud Computing Web Learning Media integrated with a scientific approach. Conversely, the post-test data from the experimental class is utilized to evaluate the final abilities of students following the administration of the aforementioned stimulus (treatment). This methodology is also applicable to the control class, albeit with a distinct stimulus (treatment), which focuses on the implementation of the scientific approach without the use of LMS-based Cloud Computing Web Learning Media.

The research instruments, in the form of pre-test and post-test questions, consisted of 15 questions each, for a total of 30 questions. The pre-test and post-test questions are aligned with the specifications of higher-order thinking skills (HOTS)

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questions, classified as C4 (analyzing), C5 (evaluating), and C6 (creating). Each of these questions has undergone a series of rigorous tests to ensure its validity, reliability, differentiation, and difficulty. These tests were conducted to maintain the accountability and accuracy of the research data. The pre-test and post-test question instruments were tested on students with similar qualifications in different groups based on the specified research sample. The results of the pre-test question instrument testing are presented in Table 3.

Table 3. Instrument Test of Research Pre-Test Questions

Question Item	Validity Test			Reliability Test	Differentiability Test	Test the Level of Difficulty Coefficient of Difficulty (DI)	Category of Level of Difficulty
	R_{Count}	R_{Table}	Sig.	Alpha Coefficient (R)	Differential Power Coefficient (D)		
1	.692**		.000		.633	.28	Difficult
2	.656**		.000		.589	.67	Moderate
3	.598**		.000		.537	.81	Easy
4	.666**		.000		.599	.64	Moderate
5	.378*		.023		.283	.67	Moderate
6	.818**		.000		.776	.58	Moderate
7	.496**		.002		.417	.25	Difficult
8	.847**	.329	.000	.897	.812	.64	Moderate
9	.768**		.000		.716	.58	Moderate
10	.642**		.000		.577	.81	Easy
11	.395*		.017		.321	.17	Difficult
12	.795*		.000		.750	.64	Moderate
13	.378*		.023		.283	.67	Moderate
14	.668**		.000		.609	.86	Easy
15	.692**		.000		.629	.64	Moderate

Source: Pre-Test Instrument Test Data, processed (2024)

As evidenced in Table 3, the results of the pre-test instrument test questions demonstrate that each question is classified as valid. As evidenced by the RCount value, which exceeds the RTable value (RCount > 0.329), and the significance value, which is less than 0.05 (Sig. < 0.05), the results are statistically significant. The Alpha Coefficient (R) assigned to the Reliability Test indicates that the instrument utilized to assess the pre-test question falls within the "good reliability" category (R > 0.80) (Budiastuti & Bandur, 2022). Moreover, the Differentiability Test (D) results indicate that the pre-test instrument comprises 12 questions classified as "very good" ($0.4 < D \leqslant 1.0$), 1 question classified as "good" ($0.3 < D \leqslant 0.4$), and 2 questions "good enough" ($0.2 < D \leqslant 0.3$) (Iskandar & Rizal, 2018). The Level of Difficulty Test (DI) categorizes 20% of the total number of pre-test questions as "difficult" ($0.00 \leqslant DI \leqslant 0.30$), 60% as "moderate" ($0.30 < DI \leqslant 0.80$), and 20% as "easy" ($0.80 < DI \leqslant 1.00$) (Son, 2019). The pre-test question instrument includes a maximum of 3 questions C4 (analyzing) items, 5 questions C5 (evaluating) items, and 7 questions C6 (creating) items. The results of the post-test instrument test are presented in Table 4.

As evidenced in Table 4, the results of the post-test instrument test demonstrate that each of the questions is classified as valid. As evidenced by the RCount value, which exceeds the RTable value (RCount > .329), and the significance value, which is less than 0.05 (Sig. < 0.05), the results are statistically significant. The Alpha Coefficient

(R) assigned to the Reliability Test indicates that the instrument utilized to assess the post-test question falls within the "good reliability" category (R > 0.80) (Budiastuti, 2022). Furthermore, the results of the Differentiability Test (D) indicate that the post-test instrument comprises 9 questions classified as "very good" (0.4 < D ⩽ 1.0), four questions classified as "good" (0.3 < D ⩽ 0.4), and 2 questions "good enough" (0.2 < D ⩽ 0.3) (Iskandar & Rizal, 2018). The Level of Difficulty Test (DI) classifies 20% of the total number of post-test questions as "difficult" (0.00 ⩽ DI ⩽ 0.30), 60% as "moderate" (0.30 < DI ⩽ 0.80), and 20% as "easy" (0.80 < DI ⩽ 1.00) (Son, 2019). The post-test question instrument includes a maximum of 3 questions C4 (analyzing) items, 6 questions C5 (evaluating) items, and 6 questions C6 (creating) items. The results of the pre-test and post-test instrument test can then be used to ascertain the competence and participation of students in the experimental and control classes. The results of the pre-test and post-test of the experimental class are listed in Table 5.

Table 4. Instrument Test of Research Post-Test Questions

Question Item	Validity Test			Reliability Test	Differentiability Test	Test the Level of Difficulty Coefficient of Difficulty (DI)	Category of Level of Difficulty
	R_{Count}	R_{Table}	Sig.	Alpha Coefficient (R)	Differential Power Coefficient (D)		
1	.548**		.001		.445	.50	Moderate
2	.380*		.022		.321	.89	Easy
3	.426**		.010		.322	.58	Moderate
4	.548**		.001		.444	.64	Moderate
5	.473**		.004		.377	.28	Difficult
6	.702**		.000		.302	.69	Moderate
7	.380*		.022		.526	.92	Easy
8	.591**	.329	.000	.819	.282	.64	Moderate
9	.566**		.000		.676	.86	Easy
10	.732**		.000		.449	.67	Moderate
11	.521**		.001		.521	.17	Difficult
12	.663**		.000		.401	.64	Moderate
13	.615**		.000		.238	.67	Moderate
14	.494**		.002		.430	.69	Moderate
15	.513**		.001		.572	.22	Difficult

Source: Post Test Instrument Test Data, processed (2024)

Table 5. Experimental Class Pre-Test and Post-Test Results

Description	Average	Cut Score	Highest Score	Lowest Score	Improved (%)
Pre Test	52,35	70	93	20	45%
Post Test	75,88		100	40	

Source: Experimental Class Pre-Test and Post-Test Data, processed (2024)

Table 5 illustrates the mean score for the experimental class pre-test, which was 52.35, while the mean score for the post-test was 75.88. The average result of the experimental class post-test was higher than the minimum completion criteria set at 70, with an increase in the average value of the post-test against the average value of the pre-test by 45%. In contrast, the results of the recapitulation of the pre-test and post-test scores of the control class are listed in Table 6.

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Table 6 illustrates the average value of the control class pre-test, which was 58.63. The magnitude of the average value of the pre-test of the control class and the experimental class does not differ significantly, indicating that students in the control and experimental classes possess comparable initial skills in the Trading Company Adjusting Journal Material. Meanwhile, the average value of the post-test for the control class was recorded at 66.47, which is below the minimum completion criteria set at 70. The increase in the average value of the post-test compared to the pre-test in the control class was recorded at 12%, which is lower than the experimental class, which was recorded at 45%. The difference can be attributed to the different stimuli (treatments) given. In this case, the experimental class (XII IPS 1) received a stimulus (treatment) in the form of LMS-based Cloud Computing Web Learning Media integrated with a scientific approach, while the control class (XII IPS 2) only received learning integrated with a scientific approach without using the same learning media.

Table 6. Control Class Pre-Test and Post-Test Results

Description	Average	Cut Score	Highest Score	Lowest Score	Improved (%)
Pre Test	58,63	70	93	27	12%
Post Test	66,47		93	27	

Source: Control Class Pre-Test and Post-Test Data, processed (2024)

The difference in grades between the experimental and control classes can be used as data for in-depth analysis with the Differential Test (t-test). This analysis can be conducted using an Independent Samples t-test to examine the level of student participation and a Paired Samples t-test to assess the improvement of students' accounting skills based on indicators of the effectiveness of the use of LMS-based Cloud Computing Web Learning Media integrated with a scientific approach. The results of the analysis are supported by the N-Gain Test, which classifies the improvement of students' accounting skills in each class (low, medium, or high). The pre-test and post-test data underwent a prerequisite test in the form of a normality test and a homogeneity test, using SPSS statistics software to recapitulate the data. The results of the prerequisite test indicate that the pre-test and post-test data in each experimental and control class are classified as usual and originate from homogeneous groups.

Table 7. Independent Samples t - Test

		Independent Samples Test								
		Levene's Test for Eq. of Var.		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Student Accounting Skills	Equal variances assumed	,130	,720	2,183	66	,033	9,441	4,324	,807	18,075
	Equal variances not assumed			2,183	65,505	,033	9,441	4,324	,806	18,076
t_{table} Statistics					1,694					

Source: Independent Samples T - Test, processed (2024)

A differential test (t-test) was conducted using independent samples t-test data from the post-test results in each experimental class and control class. The test is employed to ascertain the mean discrepancy between two groups of data that are not paired (i.e., free and independent) (Kim, 2015; Mishra et al., 2019). The Independent Samples t-test was selected as the appropriate statistical test for this analysis because the resulting data are independent, randomly assigned based on two normally distributed populations, and from two groups that have the same variance (Acharya & Rani, 2024; Ghasemi & Zahediasl, 2012). The results of the Independent Samples t-test, as generated by the SPSS Statistics software, are presented in Table 7.

As indicated in Table 7, the Equal Variances Assumed row is recorded at 0.033 or below 0.05 (<0.05). This is corroborated by the t-count value, which is greater than the t-table value (2.183 > 1.694). It can be concluded that there is a significant difference in the average post-test value of the experimental class that received a stimulus (treatment) in the form of LMS-based Cloud Computing Web Learning Media integrated with a scientific approach and the average post-test value of the control class by only receiving a stimulus (treatment) in the form of a scientific approach without the learning media. The results of the analysis demonstrate that the learning participation of students in the experimental class (XII IPS 1) is higher than that of students in the control class (XII IPS 2).

The Paired Samples t-test was employed to assess the effectiveness of the stimulus (treatment) in enhancing students' accounting skills. The Paired Samples t-test is capable of analyzing statistical mean changes between two paired observation data (Mishra et al., 2019). The pre-test and post-test data for each class are treated as independent data (paired) due to the provision of different stimuli (treatments) in each class/group. The results of the Paired Samples t-test are presented in Table 8.

Table 8. Paired Samples t - Test

Paired Samples Test									
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Pre-Test Experiment - Post-Test Experiment	-23,618	18,405	3,156	-30,039	-17,196	7,483	33	,000
Pair2	Pre-Test Control - Post-Test Control	-7,853	18,622	3,194	-14,351	-1,355	2,459	33	,019
t_{table} Statistics					1,694				

Source: Paired Samples T - Test, processed (2024)

Table 8 indicates that the two-tailed significance level of 0.000 or less than 0.05 is observed in the experimental class with an at-count value more significant than the t-table value of 7.483, which is greater than the critical value of 1.694. The mean value of the difference between the post-test and the experimental class pre-test is greater than that of the control class. The integration of LMS-based Cloud Computing Web Learning Media with a scientific approach is more effective for improving students' accounting skills than the implementation of a scientific approach without the use of learning media. It is evidenced by the significant increase in the average value of the post-test compared to the pre-test of the experimental class in comparison to the control class. The results of the Descriptive Paired Samples t-test are presented in Table 9.

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Table 9. Descriptive Paired Samples t - Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre Test Experiment	52,35	34	22,185	3,805
	Post Test Experiment	75,88	34	17,037	2,922
Pair 2	Pre Test Control	58,63	34	18,750	3,216
	Post Test Control	66,47	34	18,588	3,188

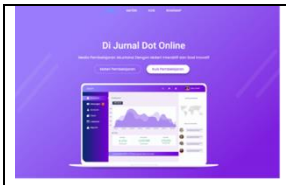
Source: Paired Samples t-Test Descriptive Test, processed (2024)

Table 9 indicates that the initial data of the experimental and control classes, as reflected in the pre-test results, demonstrate no significant difference in students' initial accounting skills. This is evidenced by the pre-test scores of the experimental and control classes, which were recorded at 52.35 and 58.63, respectively. In contrast, when examining the post-test data for each experimental and control class, the average value of the experimental class post-test is found to be higher than that of the control class (75.88 > 66.47). This is corroborated by the results of the N-Gain Test in Table 10, which indicate an increase in post-test results against the experimental class pre-test of 0.483, classified as "Medium." In contrast, the results of the N-Gain Test in the control class with the same data showed a value of 0.076, classified as "Low." These results support the assertion that the learning participation and improvement in accounting skills of experimental class students with a stimulus (treatment) in the form of LMS-based cloud computing web learning media integrated with a scientific approach are higher than those of the control class, which only implements a scientific approach without using this learning media. The results of the N-Gain test, as presented in Table 10, corroborate those of the independent samples t-test and paired samples t-test that were previously conducted.

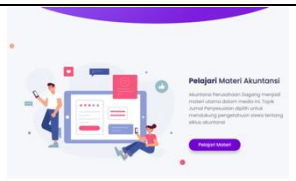
Table 10. N - Gain Test Results

Class	Average Score		N - Gain Value	Criteria
	Pre Test	Post Test		
Experiment	52,35	75,88	0,483	Medium
Control	58,63	66,47	0,076	Low

Source: N - Gain Statistical Test, processed (2024)

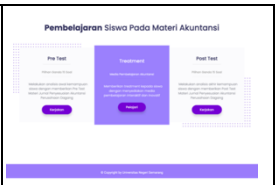


Landing Page 1



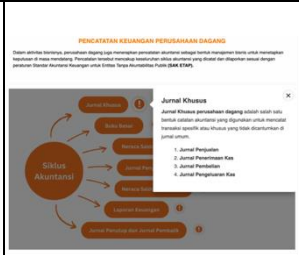
Landing Page 2

Landing Page 3



Landing Page 4

Section Material Part 1



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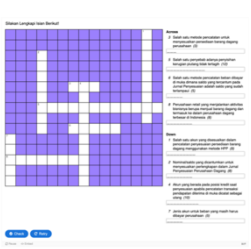
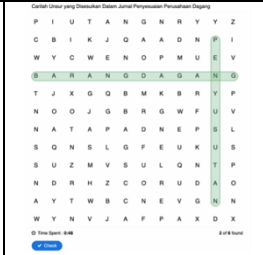

Crossword Game


Find the Words Game

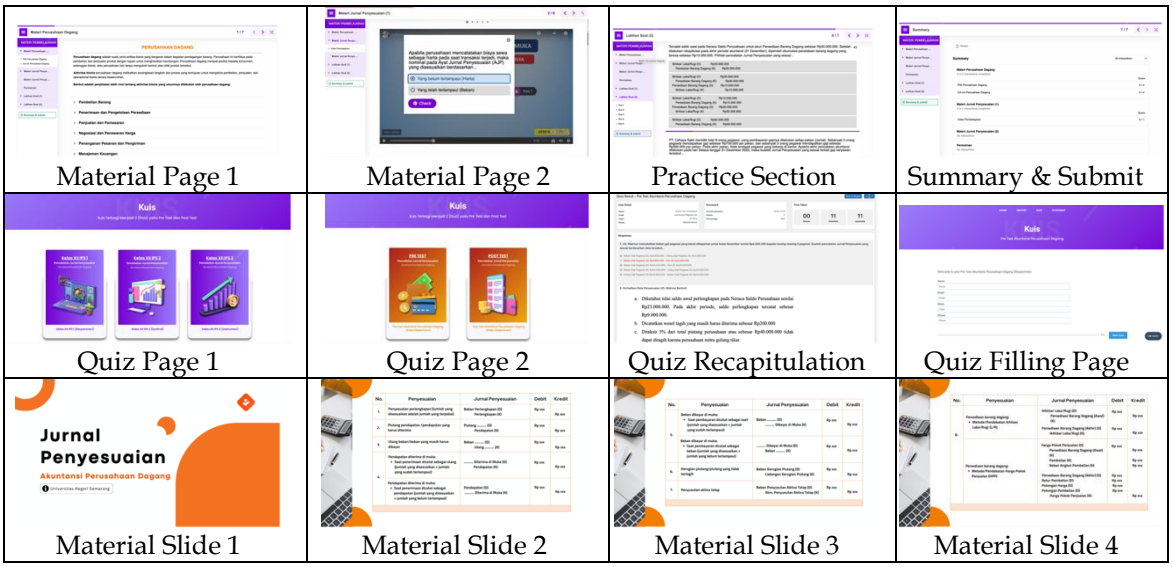


Figure 1. LMS-based Cloud Computing Web Learning Media
Source: Research learning media, processed (2024)

LMS-based Cloud Computing Web Learning Media Integrated with a Scientific Approach is Effective for Increasing Student Learning Participation

The mean score for the experimental class post-test was 75.88, which was higher than the control class score of 66.47. The experimental class post-test results demonstrate the extent of student learning participation in the learning of Trading Company Adjusting Journal Material with a stimulus (treatment) in the form of LMS-based Cloud Computing Web Learning Media integrated with a scientific approach. The increase in student learning participation in the experimental class was influenced by the presence of digital learning media that was able to support the complexity of learning material in one learning resource. It was achieved by presenting various features and games, which increased student motivation and enthusiasm for learning certain materials (Silmi & Kusmarni, 2017; Syaparuddin & Elihami, 2019).

The utilization of a Learning Management System (LMS) in the learning media employed can be accessed by all student devices at any time and place, thereby providing convenience, freedom, and attractiveness to the learning process. This is achieved by providing a safe, reliable, and flexible e-learning environment (Kraleva et al., 2019). The management of materials and content in the LMS is straightforward and can be divided into several lesson modules. It also supports automatic test-taking by students and enables the observation of improvements in students' learning skills and participation (Grönlund & Islam, 2010; Fahmi Rizal, 2021). Furthermore, previous research has demonstrated that the use of LMS in the learning process can also enhance student participation and motivation (Harandi, 2015; Huda et al., 2018; Le & Do, 2019). The use of LMS is capable of supporting both synchronous and asynchronous learning processes in the delivery of all learning materials, particularly for students (Elfeky et al., 2020; Turnbull et al., 2020). The LMS is capable of enhancing the efficacy of learning by offering a plethora of learning activities for students, in addition to its capacity to monitor and document the learning process and administer various assessments that can be conducted by teachers (Tuğtekin, 2023; Jung & Huh, 2019). The use of LMS as a learning media support system is also able to support the needs of student learning resources, increase interest in tutoring, and be able to store all student activities (Kehrwald & Parker, 2019). The flexibility of the LMS also supports the improvement

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and regulation of constructivist development tailored to pedagogical outcomes or educational goals by referring to student constraints and problems (Fraihat et al., 2020).

The significance of integrating Learning Management Systems (LMS) into the learning environment has become increasingly apparent in the context of the influence of the Covid-19 pandemic (Huang et al., 2020; Kwon et al., 2021; Raza et al., 2021; Turnbull et al., 2021). The integration of an LMS facilitates the implementation of the learning process by fostering communication and overcoming the distance between teachers and students through the integration of internet technology (Tuğtekin, 2023; Sukarman et al., 2021). The integration of learning media utilized in this study with a Learning Management System (LMS) has the potential to create an inclusive learning environment by presenting various features that support students' social activities, such as online collaborative learning, discussions, and frameworks that require collaboration across all learning subjects (Baxto et al., 2019; Dias & Diniz, 2014; Jung & Huh, 2019; Tejedor et al., 2019; Tran et al., 2020; Yulius, 2020). The Learning Management System (LMS) is an essential factor in encouraging student performance and achievement (Nasser et al., 2011; Phurikultong & Tuntiwongwanich, 2021; Ramadan et al., 2021; Saekawati & Nasrudin, 2021). The use of the LMS can encourage student involvement in the learning process by giving students the freedom to access and monitor their achievements and skills improvement (Fraihat et al., 2020). Increased student engagement is contingent upon efforts to facilitate students' autonomy in integrating the learning process with an LMS that enables students to monitor their learning process (Bradley, 2020; Wood et al., 2011).

The integration of cloud computing (CC) with learning management systems (LMS) has the potential to enhance the effectiveness and efficiency of learning. In this context, internet-integrated learning underscores the significance of adopting CC systems (Grover & Nandal, 2024; Hartmann et al., 2017). The integration of cloud computing into academic settings can enhance academic performance by increasing the accessibility and flexibility of learning resources (Chang & Wills, 2013; Changchit, 2014). Cloud computing systems can facilitate student learning activities by allowing them to adjust their time and learning style to access materials and work on projects from any location and at any time, provided that students have internet access (Achar, 2021). Consequently, students and teachers can utilize the same learning resources and collaborate to complete projects in real-time (Umar et al., 2016; Wu, 2013). Cloud-based learning media offers straightforward management, scalability, and flexibility, which enables educational institutions to provide online learning, virtual learning spaces, storage, and access to learning resources, and facilitate student collaboration with teachers remotely, thereby encouraging student learning motivation (Dahdouh et al., 2017). This can enhance student collaboration and participation in the learning process, regardless of the location of each student and teacher (Chen & Almunawar, 2016).

The presence of cloud computing (CC) systems can be utilized to analyze student participation through performance records and learning patterns, thereby identifying potential weaknesses and challenges in the learning process. This allows teachers to proactively engage students in learning activities through personalized interventions and support, with the aim of building more effective learning experiences and outcomes (Gull et al., 2020). The more significant share and participation of students in the learning process allows teachers to instruct students more freely, identify learning activities that need improvement, and support students' learning journey. The use of CC enables collaborative learning that encourages increased student and teacher

interaction (Grover & Nandal, 2024). This is implemented in the LMS-based Cloud Computing Web Learning Media used in this study.

The LMS-based Cloud Computing Web Learning Media provides a range of learning resources for the Trade Company Adjustment Journal, including practice questions in the form of case studies with a variety of question types. Each exercise question is equipped with checkpoints, which can later display the accumulated value on the "Summary & Submit" feature as a teacher indicator in assessing student participation and engagement during the learning process. The case study-based exercise questions are designed to align with the High Order Thinking Skill (HOTS) framework, specifically C4 (analyze), C5 (evaluate), and C6 (create). This approach is intended to enhance students' accounting skills. The utilization of the question base adheres to the scientific methodology employed to facilitate the learning process through the use of LMS-based Cloud Computing Web Learning Media.

Additionally, the media provides game features in the form of Augmented Reality Fun (ARF), which displays case study questions in the form of 4D after students scan the available logos or images. The Game Map presents practice questions related to Trade Company Adjustment coherently. The "Find the Words" game, the "Crossword," and the "Word Search" are designed to encourage students' interest in learning specific terms related to the Trade Company Adjustment Journal. These games are intended to enhance student motivation for the fundamental theoretical concepts that must be mastered in the Trade Company Adjustment Journal. Each game presented is capable of displaying material and case studies related to the Trade Company Adjustment Journal, thereby providing new learning experiences and increasing student learning motivation through play and learning activities. In addition, the case study questions included in the LMS-based Cloud Computing Web Learning Media are of three different types or forms: multiple choice, overlapping sentence, and true/false. The purpose of these questions is to provide feedback regarding the answers given, either right or wrong. Each type of question contains case study questions with the same material. The presentation of different forms or types of questions is designed to encourage curiosity and enthusiasm for learning, as well as to foster a sense of competition with other students due to the accumulation of assessments listed in the "Summary & Submit" feature. It can motivate student participation and activity during the learning process.

The utilization of LMS-based cloud computing learning media in this research is capable of fulfilling the essential attributes of cloud computing implementation, as described by Hartanto (2017). These attributes include suitability of needs, ease of control, dynamicity, and near-limitless scalability. The selected media is also in accordance with the characteristics of LMS-based Cloud Computing, as outlined by the National Institute of Standards and Technology (NIST), namely: (1) On-Demand Self-Service: This feature enables users or students to access learning media without requiring direct interaction with the teacher, who serves as the media manager; (2) Broad Network Access: This feature allows users or students to access learning media on various platforms and devices; (3) Resource Pooling: This feature enables the sharing of media resources among users or students, allowing them to access the media collectively; (4) Rapid Elasticity: The system is flexible, dynamic, and fast in its computing capacity, allowing for the creation, updating, and deletion of content or subject matter; and (5) Measured Service: The system can be adjusted to the specific use and needs of the material, subject, and learning outcomes that have been determined. In addition, the Learning Management System (LMS) applied to the LMS-based Cloud Computing Web Learning Media in this study has met the essential criteria that must

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be met, namely: (1) Provide self-service and self-guide; (2) Able to accumulate and deliver learning materials quickly; (3) Able to consolidate training initiatives on a scalable web-based platform; and (4) Support portability and personalization standards to support lifelong learning efforts.

LMS-based cloud computing web learning media can address student needs related to comprehensive learning resources that can accommodate the complexity of material and practice questions on the Trading Company Adjusting Journal Material. Furthermore, the presence of diverse types and forms of questions in the same material in the media can provide illustrative case studies that are more complex and relevant to the reality of the business activities of trading companies. This is anticipated to augment the "Question Bank" and students' comprehension of more intricate Trading Company Adjustment Data, thereby exerting an impact on enhancing students' accounting abilities. The presentation of practice questions in diverse formats and games on LMS-based Cloud Computing Web Learning Media is founded upon the principle of exercise, as espoused by the behaviorism learning theory. This principle underscores the learning process that is conducted repeatedly to cultivate new understanding and experiences for students.

Liu (2021) concluded in his research that the use of cloud computing (CC) in learning can increase student participation and collaboration with teachers. Furthermore, the use of CC is able to support a more scientific evaluation of student learning outcomes with defined achievement indicators. Almajalid (2017) supports the research results, stating that the use of cloud computing (CC) to support learning activities can increase the scalability and flexibility of e-learning platforms. In their research on the implementation of Learning Management Systems (LMS), Samson and Yango (2023) sought to examine the degree of involvement of teachers and students in the use of LMS. Their findings indicated that teachers and students exhibit a high level of involvement in the use of LMS, which is perceived to enhance the effectiveness of the learning process. This high level of involvement is attributed to the necessity of LMS for the learning process in question. Fakhruddin et al. (2022) employed the Learning Management System (LMS) in teaching and learning activities, with the findings indicating that the utilization of LMS can enhance learning interest, learning outcomes, and practicality, which students and teachers can perceive. Rohmawati (2022) conducted research to integrate the Learning Management System (LMS) at the college level. The findings of the study indicate that the utilization of LMS is an efficacious approach to learning, with assessment criteria encompassing the simplicity and adaptability of the LMS.

LMS-based Cloud Computing Web Learning Media Integrated with a Scientific Approach is Effective for Improving Students' Accounting Skills

The average value of the post-test for the experimental class was found to be 45% higher than that of the pre-test, whereas the control class exhibited a 12% increase. The N-Gain test corroborates these findings, indicating that the accounting skills of the experimental class students (XII IPS 1) have increased to a "Medium" level, while the accounting skills of the control class students (XII IPS 2) have only increased to a "Low" level. This evidence demonstrates that the integration of LMS-based cloud computing web learning media with a scientific approach in the experimental class is more effective than the control class, which employs a scientific approach without the use of learning media.

The effectiveness of LMS-based cloud computing web learning media in enhancing students' accounting skills is contingent upon the learning media in the form of a website (web). This is due to the high flexibility of websites, which can be used to design student learning experiences, accommodate cultural or habitual differences, and integrate diverse views and knowledge (Hur et al., 2020; Kerkhoff & Cloud, 2020; Kistyanto et al., 2022; Prahani et al., 2022; Prasetya, 2021; Pristianti & Prahani, 2022). The use of websites (web) to support the form of learning media is able to provide global access to learning material sources, thereby supporting learning, increasing student knowledge, and encouraging students' desire for lifelong learning (Anthonysamy et al., 2020; Brown et al., 2021; Endres et al., 2021; Lock et al., 2021). The use of websites as a medium for learning can be accessed by students at any time and from any location, thus facilitating the learning process (Ningrum et al., 2024).

The integration of websites in LMS-based cloud computing web learning media is primarily intended to support the digital learning process. The implementation of digital learning can enhance student learning outcomes by providing various conveniences in obtaining and understanding the subject matter, alleviating student boredom, and increasing student concentration in learning material according to learning needs and outcomes (Alifah et al., 2023). The integration of LMS-based cloud computing web learning media into online learning is a crucial aspect of this study. This integration is achieved through the utilization of devices and internet networks in the delivery of subject matter (Hamid et al., 2020; Laksana, 2021; Suryasa et al., 2020). Ningrum et al. (2024) further elucidate the advantages of website learning media in supporting internet-integrated digital learning, namely: (1) The use of educational subjects encourages collaboration and interaction; (2) The diverse types and forms of material facilitate more profound understanding and skill development; and (3) The concept of lifelong learning is supported through the application of the material.

The use of learning media in the form of websites has been demonstrated to enhance learning efficiency, foster linguistic skills, and facilitate the communicative implementation of the ideology of student-centered education (Erenchinova & Proudchenko, 2017). Web-based learning offers a number of advantages and conveniences that are not only evident in terms of attractiveness but also supported by internet technology that is straightforward to use and provides fast, engaging and interactive information access, thereby increasing student interest and motivation to learn (Marzani et al., 2023). The integration of the internet with learning media in the form of a web enables the realization of learning activities that are both enjoyable and encourage student participation. This is achieved through the high flexibility of the web, which increases student memory related to the material they learn (Januarisman & Ghufron, 2016; Sari & Suswanto, 2017). The rapidity of access to information on learning websites enables the creation of learning activities that are not constrained by place or time, thereby facilitating more effective learning experiences (Rohdiani, 2017). The internet facilitates the use of websites as learning media, providing up-to-date information and accessibility across different educational subjects and locations (Haleem et al., 2022). The utilization of websites can facilitate the dissemination of information by taking into account the temporal novelty of the content in question (Rahayu & Sudaryono, 2023). As a means of disseminating information, websites facilitate the acquisition of the latest information and news on a global scale, accessible at any time and from any location (Abdi & Omri, 2020). The use of website-based learning media is founded upon a student-centered principle, which allows students to learn independently, assume responsibility for the learning process, and access the material at any time and from any location. Additionally, students have unlimited

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access to various features, including online discussions, which facilitate high flexibility and encourage self-regulated learning, ultimately enhancing their participation and activity (Wahyuni et al., 2020).

The LMS-based cloud computing web media, which has been integrated with a scientific approach in this study, has been found to fulfill the criteria for the form of media in the form of a website. These criteria include (1) Usability: The media used makes it easy for students to access the Trading Company Adjusting Journal Material; (2) System Navigation Structure: Each page and button on the media provides clear and integrated information, increasing the effectiveness and efficiency of learning; (3) Content: The material on the media is relevant to the material that students learn; (4) Compatibility and Functionality: The media utilized can perform its functions effectively, even when accessed via disparate search engines; (5) Accessibility: The media provides students with the freedom and flexibility to access subject matter in support of inclusive teaching and learning activities; and (6) Interactivity: The media presents user experience (UX) in the form of feedback, thereby increasing the interactivity of the website. The utilization of digital (online) media in the form of a website can optimize the effectiveness of learning and facilitate the development of students' potential by fostering collaboration and active participation in the classroom (Caena & Redecker, 2019). The creation of effective learning environments can foster enthusiasm for learning and creativity, thereby enhancing student learning outcomes (Ali et al., 2020; Sipayung et al., 2021). The utilization of learning media in the format of a website can facilitate online learning, which is centered on student learning activities and has an impact on students' comprehension of the material they are studying (Utomo et al., 2022).

The efficacy of utilizing LMS-based cloud computing web learning media integrated with a scientific approach is also corroborated by questionnaires completed by students in the experimental class (XII IPS 1). This is based on the material on the LMS-based Cloud Computing Web Learning Media, which is accessible only to students in the experimental class (XII IPS 1). Students in the control class are unable to utilize the media in learning activities. The questionnaire employed a five-point Likert scale, with responses classified as "Strongly Agree," "Agree," "Neutral," "Disagree," and "Strongly Disagree." The objective of the questionnaire is to elicit information from students regarding their perspectives on the utilization of these media in the learning process. The questionnaire can also be employed to analyze student responses to various aspects of learning motivation, including the ease of use of the learning media, the ease of receiving and learning the material taught with the help of the learning media, the extent to which the learning media support the interactive learning process, and the extent to which the learning media encourage the improvement of students' accounting skills. The results of the questionnaires completed by students are presented in Table 11.

A review of the responses to the questionnaire in Table 11 indicates that the majority of students in the experimental class strongly agree with the use of LMS-based cloud computing web learning media integrated with a scientific approach in teaching and learning activities. This is corroborated by the considerable number of students who indicated a "strongly agree" response with regard to the utilization of this learning medium to enhance student motivation, facilitate ease of use, assist in the comprehension of the material, promote high interactivity, and facilitate the improvement of students' accounting skills. This assertion is corroborated by the number of students who indicated agreement with the use of integrated LMS-based

cloud computing web learning media with a scientific approach based on the same objectives.

Table 11. Questionnaire on the Use of Learning Media

No.	Question List	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Learning media can help you increase your motivation to learn	62%	38%	-	-	-
2.	Learning media is easy for you to use	68%	32%	-	-	-
3.	Learning media can help you understand the material	74%	26%	-	-	-
4.	Learning media has high interactivity	76%	24%	-	-	-
5.	Learning media is able to improve your accounting skills	68%	32%	-	-	-

Source: Questionnaire Data, processed (2024)

The implementation of the use of LMS-based Cloud Computing Web Learning Media in the experimental class allows for the adjustment of the learning environment to the basis of behaviorism learning theory, which was previously established. Behaviorism learning theory posits that learning is a process of stimulus and response (Nahar, 2016). The stimulus can be defined as the situations and conditions of the student learning environment, both internal and external. The response, in turn, is the reciprocal of reactive behavior due to the stimulus or stimuli previously received (Abidin, 2022). The implementation of behaviorism theory in learning activities is based on the principles proposed by Edward Lee Thorndike (1874-1949). LMS-based Cloud Computing Web Media focuses on the law of exercise principle. This principle underscores the significance of the stimulus (treatment), which is delivered through the provision of practice and is repeated on a regular basis. The law of exercise principle is implemented in the LMS-based Cloud Computing Web Learning Media used in this study through learning activities that are balanced with the provision of practice questions that students must complete on the learning media. The incorporation of case study exercises with a variety of question formats can stimulate student curiosity and motivation to learn. This is complemented by the inclusion of game features that present practice questions, thereby enhancing student engagement in the learning process. The objective is to incorporate case studies that are pertinent to the operational realities of trading companies into the curriculum, thereby transforming the conventional learning paradigm (lectures) that educators commonly employ. This approach is designed to enhance students' knowledge and skills pertaining to the recording of transactions in trade company accounting. The efficacy of these initiatives is evidenced by the notable enhancement in students' accounting abilities, as evidenced by the substantial increase in the post-test scores of the experimental class in comparison to the pre-test scores of the control class.

The scientific approach implemented to support the application of LMS-based cloud computing web learning media is based on constructivist learning theory. This theory emphasizes the learning process of students, which is formed from experiences

and social activities. The objective is to improve students' cognitive abilities in analyzing problems, solving problems, and determining the best solution to solve these problems based on the concept of the zone of proximal development (ZPD) (Chen & Lertamornsak, 2023). The implementation of the constructivist learning theory can be achieved through the provision of problem-based learning methods (Waseso, 2018). This is in accordance with the problem exercises and learning methods used in this study, which focus on providing problem exercises in the form of case studies of adjustment data relevant to the business activities of trading companies. The scientific approach to learning involves five stages that must be carried out sequentially and in a structured manner. These stages are (1) Observation, (2) Questioning, (3) Collection and creation of data or information, (4) Association, and (5) Communication. The existing learning stages align with the fundamental principles of constructivism learning theory, which emphasizes the provision of material in gradual increments in accordance with the concept of scaffolding as described in the learning theory. The efficacy of a scientific approach based on constructivism learning theory can be demonstrated by the incorporation of diverse case studies, which have been shown to enhance students' accounting abilities in the final assessment (post-test).

The results of this study align with those of Yuliana and Anistyasari (2023), who also utilized e-learning media in the form of websites to facilitate learning activities. Their study concluded that the learning media is able to improve student learning outcomes based on the final assessment conducted. Similarly, Danaswari and Gafur (2018) attempted to integrate website learning media to support accounting learning. The findings of this study indicate that the utilization of websites as a learning medium can enhance student motivation and improve accounting learning outcomes. Riyanti (2017) conducted research on the use of website blogs as an alternative learning medium for students, with the results indicating that students responded favorably to the integration of this medium in learning activities. Farmana and Yasin (2022) endeavored to develop website-based learning media through the WordPress platform to facilitate student learning. The results of the analysis and student responses indicate that the use of learning media is a viable and suitable approach. The integration of website-based learning media can facilitate students' access to subject matter at any time, thereby enhancing the flexibility of learning methods. Astuti et al. (2020) employed a research methodology to develop website-based learning media, which presents interactive content to students. The results of the analysis of the questionnaire administered to students indicated that the learning media obtained a feasibility score of 82 out of 100, with a satisfaction level of "very good," and thus may be applied as an interactive learning medium in the classroom.

CONCLUSION

The results of this study indicate that the integration of LMS-based cloud computing web learning media with a scientific approach is an effective method for increasing student learning participation. This is evidenced by the high average post-test score of the experimental class, which was recorded at 75.88. The post-test results were higher than those of the control class, which only showed an average post-test score of 66.47. The integration of LMS-based cloud computing web learning media with a scientific approach has also been demonstrated to be an effective method for enhancing students' accounting skills in the context of the trading company adjusting journal material. This conclusion is supported by the significant increase in post-test results observed in the experimental class, with an improvement of 45% compared to

the pre-test. In contrast, the control class demonstrated a relatively modest increase of 12%. The results of the N-Gain Test corroborate this assertion, indicating that the increase in the average value of the experimental class when comparing the post-test to the pre-test is classified as a "Medium" increase. Conversely, the N-Gain Test results for the control class indicate that there is an increase in the average value of the post-test compared to the pre-test, which is classified as "Low." The effectiveness of this learning media in increasing students' learning participation and accounting skills is also supported by the results of a questionnaire administered to students in the experimental class. The results indicate that the majority of students strongly agree with the use of LMS-based cloud computing web learning media integrated with a scientific approach in learning trading company adjustment journal material.

The limitations of this study are primarily related to the use of LMS-based Cloud Computing Web Learning Media integrated with a scientific approach that focuses exclusively on theory and case studies on the Trading Company Adjusting Journal Material. Consequently, different results may be observed when this approach is employed to support the practicum learning process on different materials. In light of the aforementioned limitations, recommendations are made for future research on this topic to develop LMS-based cloud media that can be utilized to support practicum learning. This media should be implemented online and presented in the form of a website.

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