

The Application of Contextual Teaching and Learning Model Using Mockup Media in Surabaya Vocational High School

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Abstract: This research is motivated by direct observations made at Surabaya Vocational School showing that students tend to be sleepy and not excited because the learning method used is lecturing. Schools need a learning model that can increase the activeness of the learning process. The application of the CTL learning model using mockup media can make students more active in the learning process. The research method used a type of quasi-experimental research with a posttest-only design, a non-equivalent control group design, with a quantitative approach. The research population was class students of Surabaya Vocational High School. The research sample using a random sampling technique amounted to 72 people. The research instruments used were validation sheets, syllabus, lesson plans, mockup media, posttest questions, observation sheets and student responses. Data analysis using the t-test for independent samples. The results showed that (1) the implementation in applying the learning model for teachers got a percentage of 89.2% and for students 88.4%, showing a very good category; (2) the learning outcomes of experimental class students got an average of 87.5, while the control class was 81.39. showing the results obtained by the experimental class were greater than the control class; (3) the response of experimental class students got a percentage of 85.64% and the control class was 81.89%, showing a very good category.

Keywords: Vocational Education, Contextual Teaching and Learning, Implementation, Learning Outcomes, Response

1. Introduction

Vocational High Schools are schools that have expertise or competency programs that aim for students to become graduates who are ready to become professionals in the world of work. Surabaya Vocational High School is one of the many vocational high schools located in the central region of Surabaya, which has an engineering expertise program in which one of the competencies is Building Construction Sanitation and Maintenance (BCSM) [6]. This competency has implemented Building Construction subjects where this subject requires students to master the material provided.

The results of direct observations made during the implementation of the Introduction to School Field at Vocational High Schools 5 Surabaya in 2022 found that students tend to be less enthusiastic and less active because the teacher explains the material by lecturing. With teachers who lecture and do not involve students in the learning process,

students tend to ignore and be passive, only listening to the teacher when explaining the material provided and taking notes on important things. During the learning process, the material can still not be maximized because it still uses the lecture method without using media. The absence of learning media makes students have to imagine themselves about the material provided. This is certainly very difficult to do because students still do not have direct experience of the material given. This results in a lack of understanding of the material provided it has an impact on academic grades and low student learning outcomes, this is evidenced by the total average midterm test score of students at Surabaya Vocational High School in the Building Building Construction subject of 70.8 with minimum completeness criteria is 75. This value proves that the average value of students is still below the minimum.

The learning method used by the teacher should be learning that can increase student interest and activeness so that the

learning outcomes given can meet the Minimum Completeness Criteria. Efforts in learning activities can be made by using a learning model [7].

The learning model is the pattern of choice to improve learning outcomes. That is, teachers can determine relevant and efficient learning models to achieve learning goals. The types of learning in teaching include the CTL is an abbreviation for contextual teaching and learning, cooperative learning, problem-based learning and inquiry. Focusing on CTL, this learning model provides a real-life experience to learning and allows it to be applied in outside the classroom [12].

CTL is a concept of education that teachers implement by presenting real-world situation in the classroom and encouraging students to make associations between their acquired knowledge and its application in life, while students acquire knowledge through experience or the process of self construction [13].

The CTL model is a learning model that helps teachers be able to directly provide examples that exist in the environment around students in their daily lives. Students are also required to be able to think based on their observations around the environment. Thus, the selection of the right CTL can help students to be more comprehensible of material presented by their teachers [14].

Contextual Teaching and Learning (CTL) is a student-centered instructional approach that emphasizes the connection between the learning content and real-world contexts. This model aims to enhance student engagement, critical thinking skills, and problem-solving abilities by making learning more relevant and meaningful [15].

The CTL model is grounded in constructivism and situated theories, emphasizing the active participation of students in constructing knowledge based on their existing experience and contexts [16]. This learning concept features several key components, including connecting learning with everyday situations, using real-world examples, encouraging collaboration and communication, and promoting critical thinking and problem solving skill [17].

The successful implementation of vocational education hinges on cultivating students' critical and creative thinking skills. To effectively facilitate this, the judicious integration of diverse media resources is essential. These resources can not only complement the instructor's pedagogic approach but also enhance student learning outcomes by fostering a more engaging and interactive learning environment. Notably, media can mitigate the reliance on abstract imagination and conjecture, leading to a deeper and more concrete understanding of the subject matter [18]. Within this framework, mockup media, as a specific form of instructional tool, offers a valuable avenue by employing simulated representations of real-world concepts to further amplify student comprehension and engagement [19].

Among the diverse pedagogical tools available, Mockup Media has emerged as a particularly effective medium for facilitating the acquisition of theoretical knowledge. By providing students with tangible representations of abstract

concepts, Mockup Media fosters a deeper and more concrete understanding of the material. Through engagement with these visual aids, students are empowered to readily construct mental models of the theoretical constructs under study [21].

The implementation of captivating learning media can demonstrably enhance student engagement, thereby propelling them towards deeper knowledge acquisition. Within this sphere, Mockup Media emerges as a powerful tool, capable of significantly improving student learning outcomes in vocational education settings [22]. By virtue of its ability to depict objects and concepts in a more tangible and concrete manner, Mockup Media facilitates a more profound understanding for students [23].

Mock-up media, with its visual and interactive nature, emerges as a powerful tool for achieving these goals. By transforming abstract information into tangible representations, mock-ups can not only spark curiosity and engagement but also promote deeper understanding and critical analysis. This shift from abstract to concrete can empower students to actively participate in the learning process, leading to a more meaningful and enjoyable learning experience [24].

Mockup media refers to tangible or virtual representations of real world objects or concepts that can be used within the CTL model to enhance student engagement, understanding, and application of learning material [20]. This media can be effectively designed and implemented collaboratively with students in the CTL model [25].

Based on the above background, the authors want to conduct research on the Application of the Contextual Teaching and Learning Learning Model by Using Media Mockups at Surabaya Vocational High School because students feel firsthand that the application of the learning model used by teachers in Building Construction subjects in class XI BCSM tends to be uninteresting and does not make students eager to learn so that they get an average score of 70.8 throughout the XI BCSM class which indicates that it is still below the minimum score. This makes the author motivated to use the Contextual Teaching and Learning (CTL) learning model and also interesting mock-up learning media so that it can improve student learning outcomes. By conducting this research, it is hoped that it will be able to improve student learning outcomes and also encourage students to play an active role in learning activities.

1.1. Research Question

Based on the research background described above, the following research questions were formulated:

1. How is the implementation of learning on the achievement indicators of the CTL learning model for teachers and students on Building Construction material at Surabaya Vocational High School?
2. What is the difference in student learning outcomes in class XI BCSM 1 using the CTL learning model with mockup media and class XI BCSM 2 using the CTL learning model on Building Construction material at Surabaya Vocational High School?

- How is the response of students in class XI BCSM 1 using the CTL learning model with mockup media and class XI BCSM 2 using the CTL learning model on Building Construction material at Surabaya Vocational High School?

1.2. Purpose of the Study

The purpose of this research is based on the formulation of the problems described above, namely:

- Knowing the learning implementation of the achievement indicators of the Contextual Teaching and Learning (CTL) model for teachers and students on Building Construction material at Surabaya Vocational High School.
- Knowing the differences in student learning outcomes in class XI BCSM 1 using the Contextual Teaching and Learning (CTL) model with mockup media and class XI BCSM 2 using the Contextual Teaching and Learning (CTL) model on Building Building Construction material at Surabaya Vocational High School.
- Knowing the responses of students in class XI BCSM 1 using the Contextual Teaching and Learning (CTL) model with mockup media and class XI BCSM 2 using the Contextual Teaching and Learning (CTL) model on Building Construction material at Surabaya Vocational High School.

2. Methodology

2.1. Study Design

This study employs experimental methodology. The application of this research of the quasi-experiment approach allows it to obtain an image of the learning objectives of the students. Furthermore, a posttest-only, non-equivalent control group design was employed in the study. A control group and an experimental group participated in the experimental testing.

Table 1. Posttest Only, Non-equivalent control group design.

Group	Conduct	Test
Experimental Group	X	0 ₁
Control Group		0 ₂

2.2. Target Groups

The research was conducted at Surabaya Vocational High School during the second semester of the 2022/2023 school year in Class XI BCSM. The sample for this research included students from two different classes: XI BCSM 1 and XI BCSM 2, totalling seventy-two (72) students.

2.3. Data Collection Techniques

This study included observation, tests, and questionnaires as data collection methods. The observational data of this study were obtained through observers who were actively involved in the learning process, documenting key elements of the learning

technique. During learning activities, students and teachers act as observed subjects to determine the implementation of learning techniques. After students are given a lesson, a test is given to assess how well they have understood the topic. The only method used in this study to collect information on student learning outcomes is a post-test given to each class. This questionnaire technique by giving a closed questionnaire to students. This questionnaire was given to determine the response of students to the Contextual Teaching and Learning (CTL) learning model by using mockup media.

2.4. Data Analysis Techniques

The following are the data analysis techniques used in this study:

2.4.1. Analysis of Learning Implementation Results

This analysis was conducted to measure the suitability of the implementation of learning for teachers and students who had previously been planned by using a contextual teaching and learning model with mockup media. This formula for calculating the percentage [1].

$$Percentage = \frac{\Sigma Score Calculation Results}{Number of Observers} \times 100\%$$

Table 2. Interpretation of the learning implementation percentage.

Assessment	Percentage
Very Good	81%-100%
Good	61%-80%
Good Enough	41%-60%
Not Good	21%-40%
Very Not Good	0%-20%

2.4.2. Analysis of Learning Outcomes

Analyzing learning outcomes to assess a student's individual or classical completion status. If each student achieves a score more than or equal to the minimal completeness criterion of ≥ 75 , they can be considered complete. This formula can be used to determine an individual's completeness [2].

$$Individual\ Completeness = \frac{\Sigma Correct\ student\ answers}{Total\ Number\ of\ Questions} \times 100$$

However, if an classical completeness receives $\geq 85\%$ score, then is considered to be finished.

$$Classical\ Completeness = \frac{\Sigma Completed\ Students}{Total\ Number\ of\ Students} \times 100\%$$

2.4.3. Analysis of Student Response Results

Student response analysis involves assessing how students react to the implementation of Contextual Teaching and Learning techniques, specifically using mockup media during their learning experience. This evaluation gathers data through a questionnaire distributed to students after their sessions. The analysis employs a particular formula to interpret this information [1].

$$P (\%) = \frac{\Sigma F}{N \times I \times R} \times 100\%$$

P(%) = Percentage

ΣF = Total Score of All Respondents

N= Number of Respondents

I= Maximum Amount of Score

R= Number of Questions

Table 3 presents an assessment of the percentage of student responses.

Table 3. Interpretation of Student Response Scores.

Assessment	Percentage
Very Good	81%-100%
Good	61%-80%
Good Enough	41%-60%
Not Good	21%-40%
Very Not Good	0%-20%

3. Results

3.1. Observation Results of Learning Implementation

There are two distinct learning implementations: one for teachers and one for students. The introduction, core, and closing activities make up the many facets of this learning implementation. Two people observed the learning process in action. Every learning meeting includes an assessment of the way that the lessons have been implemented.

3.1.1. Observastion of Learning Implementation for Teacher

As shown in Table 4, Based on observations made during the implementation of learning for teachers, the experimental class received a cumulative average of 88.8%, placing it in the very good category. While the control class received 89.6%, placing it in the very good category.

Table 4. Results of Observations on Learning Implementation for Teacher.

Learning Stages	Experimental Class		Control Class	
	Results	Category	Results	Category
Introduction	95%	Very Good	95%	Very Good
Core Activities	83,3%	Very Good	81,7%	Very Good
Closing Activities	88%	Very Good	92%	Very Good
Total Average	88,8%	Very Good	89,6%	Very Good

3.1.2. Observastion of Learning Implementation for Students

As shown in Table 5, Based on observations made during the implementation of learning for students, the experimental class received a cumulative average of 87,9%, placing it in the very good category. While the control class received 89%, placing it in the very good category.

Table 5. Results of Observations on Learning Implementation for Students.

Learning Stages	Experimental Class		Control Class	
	Results	Category	Results	Category
Introduction	88,3%	Very Good	91,7%	Very Good
Core Activities	83,3%	Very Good	83,3%	Very Good
Closing Activities	92%	Very Good	92%	Very Good
Total Average	87,9%	Very Good	89%	Very Good

3.2. Student Learning Outcomes

From the posttest results in Table 6, it was possible to determine that the classical learning in both classes was complete $\geq 85\%$. In the experimental class, 35 out of 36 students completed the posttest questions, yielding a classical completeness of 97.22%. In the control class, 32 out of 36 students completed the posttest questions, yielding an 88.89% classical completeness.

Table 6. Completeness of Student Learning Outcomes.

Group	Number of Student	Individual Completeness	Classical Completeness	Average
Experimental Group	36	35	97,22%	87,50
Control Group	36	32	88,89%	81,39

3.3. Student Response Results

Based on post-learning student evaluations in Table 7, the experimental class that used media mockups to facilitate behaviour utilizing a contextual teaching and learning approach received a total percentage of 85.64%, placing them in the very good category. The control group, which employs a contextual teaching and learning methodology without mockup media, achieved a percentage of 81.89%, placing it at a very good category.

Table 7. Student Response Results.

Number	Experimental Group		Control Group	
	Percentage	Category	Percentage	Category
A	Contextual Learning Learning Model			
1	81,11%	Very Good	80%	Good
2	85,56%	Very Good	83,89%	Very Good
3	78,33%	Good	82,22%	Very Good
4	82,22%	Very Good	78,89%	Good
5	79,44%	Good	77,22%	Good
6	84,44%	Very Good	83,33%	Very Good

Number	Experimental Group		Control Group	
	Percentage	Category	Percentage	Category
7	84,44%	Very Good	82,22%	Very Good
8	81,67%	Very Good	81,11%	Very Good
9	90%	Very Good	85%	Very Good
10	86,67%	Very Good	85%	Very Good
B	Mockup Media			
1	92,78%	Very Good	-	-
2	91,11%	Very Good	-	-
3	91,6%	Very Good	-	-
4	86,11%	Very Good	-	-
5	76,67%	Good	-	-
6	83,89%	Very Good	-	-
7	87,78%	Very Good	-	-
8	87,78%	Very Good	-	-
9	92,22%	Very Good	-	-
10	88,89%	Very Good	-	-
Total Average	85,64%	Very Good	81,89%	Very Good

4. Discussion

The implementation of the contextual teaching and learning model demonstrated significant positive results. Analysis of the

obtained data indicated that, on average, 89.2% of teachers exhibited performance exceeding expectations, categorized as "very good." Similarly, 88.4% of students achieved performance exceeding expectations, also categorized as "very good." These findings align with the results of previous research conducted by Mifta Diani (2019). This alignment is evidenced by the adept application of the contextual teaching and learning model within the utilization of mockup media among teachers, resulting in a notable 90.56% proficiency, categorizing them as "Very Good". Similarly, students exhibit a commendable 91.15% proficiency, also classified within the "Very Good" category [3]. Research by Norma (2018), has shown that application of the contextual teaching and learning model for teachers yielded a percentage of 85.4%, categorized as "Very Good". Meanwhile, a student achieved 74.6% proficiency, categorizing them as "Good" [9]. These outcomes substantiate the effective assimilation and application of acquired knowledge by both teachers and students, as indicated by benchmarks reflecting their attainment in learning activities.

Analysis of the study data reveals an average score of 87.50 in the experimental class utilizing the CTL learning model supplemented with media mockups, while the control class employing the CTL learning model without media supplementation achieved an average score of 81.39. This translates to an average difference of 6.11 points, demonstrating the significantly higher learning outcomes associated with the inclusion of media mockups in the CTL learning model. This learning outcome aligns with previous research conducted by Oktafiana (2020), demonstrating an average result value of 81.6 for the experimental class and 76.6 for the control class [4]. According to Willi's research (2013), the average learning outcome in the control class following the treatment was 77.08, whereas the experimental class achieved an average grade of 81.5 [10]. These results underscore the discernible superiority in learning outcomes within the experimental class utilizing the CTL learning model integrated with mockup media, as opposed to the control class employing the CTL learning model without media.

This study's analysis of student responses demonstrates that the application of the CTL learning model elicited highly positive results. Within the experimental class, a remarkable 85.64% of student responses were categorized as "very good," exceeding expectations. Notably, the control class also achieved an admirable average of 81.89% in the "very good" category. This finding provides compelling evidence that students respond favourably to the CTL learning model, aligning with previous research conducted by Sari (2019), indicating that the student response rates reached 82.28%, classifying them within the "very good" category. Sari's findings unveil the heightened interest and contentment among students participating in the learning process, consequently fostering increased engagement in teaching and learning activities [5]. According to Addaini's research (2020), the student response to the CTL learning model attained a percentage of 87.3%, indicating that the average student response falls within the "Very Good" category [11]. Moreover, the utilization of mockup media significantly

enhances students' comprehension of the learning materials, thereby bolstering their motivation to participate in the instructional process. This underscores the substantial positive impact of the CTL learning model integrated with mockup media on eliciting highly favourable student responses.

5. Conclusion

The examination of the contextual teaching and learning (CTL) model's implementation in Class XI BCSM at Surabaya Vocational High School highlights its impact on both educators and students. The outcomes reflect commendable achievements, with teachers achieving an 89.2% rating, denoting a "very good" category, while students achieved an 88.4% score, similarly classified as "very good." This compelling evidence suggests that the implementation of the CTL learning model has been very well by the achievement indicators so that the results of research data obtained enhance the credibility and accuracy of the findings. Furthermore, the comparison of learning outcomes between the experimental and control classes employing CTL with and without mockup media displays a notable discrepancy. The experimental class, utilizing the CTL model with mockup media, exhibits a substantial 97.22% classical completeness rate with an average score of 87.50, surpassing the control class's 88.89% completeness and an average score of 81.39. This disparity of 6.11 in mean difference underscores the impact of integrating mockup media in enhancing learning outcomes. The use of the CTL model in teaching and learning activities is very efficient and desirable to be used to improve student learning outcomes [8]. Moreover, student responses reflect positively on the use of CTL, with mockup media garnering an average of 85.64% and CTL without media receiving an average of 81.89%, both falling within the "very good" category. These comprehensive findings validate the efficacy of incorporating mockup media within the CTL framework, showcasing its positive influence on both student engagement and learning outcomes.

6. Recommendations

The recommendations that follow are derived from the described discussion:

1. The quality of the mockup media material has been evaluated accurately. However, its look is thought to be less accurate or neat, thus it is anticipated that the shape of the mockup to be built will be further refined in the following study.
2. Implementation of learning using the model of contextual teaching and learning, certain students are not very cooperative during the presentation, which makes the class busy and results in a lack of focus. In order to ensure that learning proceeds smoothly in the following study, teachers are supposed to be more assertive in their conditioning of students.
3. The content to be covered in the application of contextual teaching and learning should be present

during the observation period inside a learning environment, allowing students to conduct observations without having to leave the school.

4. According to the results of students applying the contextual teaching and learning model, certain individuals have not fully grasped the material, likely due to challenges in comprehending the content. Consequently, teachers are encouraged to deliver the material gradually and in-depth to ensure comprehensive understanding among all students.

Conflicts of Interest

The authors declare no conflict of interest.

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