

The Effectiveness of Contextual Learning Approach in Improving Civic Education Learning Outcomes

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Abstract

Vocational education in Vocational High Schools requires learning that is not only oriented to mastering concepts, but also to students' ability to apply knowledge contextually following the demands of the contextual problem. However, the dominance of conventional learning still has the potential to produce learning outcomes that are less meaningful and difficult to transfer to real situations. Therefore, this study aims to analyze the effectiveness of the contextual learning approach in improving the learning outcomes of vocational school students. A quantitative research methodology was applied using a quasi-experimental pretest-posttest control group design to examine the effects of the intervention. The research population was class X students at SMK Darul Amin Madura, with a sample of 80 students divided into experimental groups and control groups of 40 students each. The results revealed a statistically significant difference in posttest scores, with the experimental group outperforming the control group with t score equivalent to 3.27 ($p < 0.01$). ANCOVA results confirmed that the learning approach had a significant effect on learning outcomes after controlling for initial ability ($F = 10.84$; $p < 0.01$; partial $\eta^2 = 0.12$). In addition, the N-gain value of the experimental group ($M = 0.67$; moderate-high category) was higher than that of the control group ($M = 0.38$; moderate category). These findings show that the contextual learning approach is effective in improving the learning outcomes of vocational school students.

Keywords: Civic Education, Contextual Learning, Learning Outcome, Vocational Education

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INTRODUCTION

The improvement of student learning outcomes represents a fundamental challenge in education, especially in vocational education settings such as Vocational High Schools (SMK). In contrast to general education, vocational schools have a mandate to prepare graduates who not only master conceptual knowledge, but are also able to apply this knowledge in the context of real work. Therefore, learning outcomes in vocational education must reflect the integration between concept understanding and applicability skills. However, various studies show that learning in vocational schools is still dominated by conventional teacher-centered approaches, resulting in learning outcomes that are superficial and do not support knowledge transfer to the world of work (Biggs et al., 2022; Bramantya et al., 2024; Hattie, 2008). This condition confirms the existence of fundamental problems in vocational learning practices that need to be studied scientifically.

These challenges have become increasingly urgent in light of 21st-century skill demands that prioritize employability and work readiness, contextual problem-solving, and adaptive skills. Evidence from previous research syntheses suggests that instructional approaches emphasizing active learner engagement and authentic learning contexts are more effective in improving learning outcomes than lecture-centered methods. (Hattie, 2008). However, learning practices in many vocational schools still do not fully integrate the vocational context into the learning process, so the knowledge gained by students is often separate from the real situations they will face after graduation.

In this context, the contextual learning approach or Contextual Teaching and Learning (CTL) is seen as a relevant pedagogical alternative. CTL emphasizes the relationship between learning materials and the real-life context of students, so that learning becomes more meaningful and functional (Johnson, 2002). This approach is based on the theory of constructivism which views learning as an active process in building knowledge through experience and interaction with the environment (Bada & Olusegun, 2015; Ratcliff, 2024; Zhang, 2022). For vocational education, CTL has a high suitability because it is in line with the principles of learning by doing and real problem-based learning.

A number of empirical studies in the past decade published in reputable journals show that contextual learning approaches and active learning can significantly improve student learning outcomes. Studies in the field of science and engineering education report that context-based learning improves conceptual understanding and knowledge transfer capabilities compared to conventional learning (Alzu'bi, 2015; King & Henderson, 2018; Ngozi, 2021; Sik, 2015). Quasi-experimental research conducted by (Suryawati & Osman, 2017) showed that students who learned through a contextual approach obtained higher learning outcome scores and showed deeper conceptual understanding than the control group.

Although these results show the potential of CTL, the literature review also reveals a number of limitations. First, most research on contextual learning is still conducted in general education or higher education, while research that specifically examines the context of vocational schools is still relatively limited. Second, many studies measure learning outcomes narrowly, especially in cognitive aspects, without explicitly linking them to the applicative ability that is the main characteristic of vocational education. Third, the findings of the study show considerable variation in the effectiveness of CTL, which is influenced by the quality of learning design, alignment of objectives and assessments, and the level of implementation of the approach in the classroom (Chen et al., 2016; Lotulung et al., 2018; Newman & DeCaro, 2019; Rahman et al., 2023).

Based on these conditions, there is a significant research gap, namely the lack of quasi-experimental research that systematically tests the effectiveness of contextual learning approaches in vocational school students by paying attention to the characteristics of vocational learning. Many previous studies have not provided strong empirical evidence on the extent to which CTL is able to improve learning outcomes in the context of vocational education that demands the practical application of knowledge. As a result, the practical implications of the study's findings are still limited for teachers and vocational education policymakers.

The novelty of this study resides in its emphasis on vocational school students as the primary research population, as well as in the contextual conceptualization and measurement of learning outcomes. This research not only views learning outcomes as cognitive achievements, but also as students' ability to understand and apply knowledge in accordance with the characteristics of vocational learning. In addition, this study uses a quasi-experimental design to systematically compare contextual learning with conventional learning, so that it is expected to be able to produce stronger and relevant empirical evidence for the development of learning practices in vocational schools.

The significance of this research is theoretical and practical. Theoretically, this study expands the study of contextual learning in the realm of vocational education which is still relatively underexplored in the Scopus indexed international literature. From a practical perspective, the findings of this study are expected to serve as a valuable reference for vocational school teachers in designing learning experiences that are more meaningful and closely aligned with the demands of the workforce, as well as for policymakers in formulating vocational curricula and instructional strategies.

Consistent with this rationale, the present study aims to evaluate the effectiveness of a contextual learning approach in enhancing vocational school students' learning outcomes. Specifically, it examines differences in learning outcomes between students taught using a contextual learning approach and those receiving conventional instruction. Grounded in constructivist learning theory and supported by prior empirical evidence, this study posits that the contextual learning approach exerts a positive and statistically significant effect on students' learning outcomes. Within this framework, the learning approach (contextual versus conventional) is treated as the independent variable, while students' learning outcomes constitute the dependent variable. This hypothesis was tested using a quasi-experimental research design employing a pretest–posttest control group model.

METHOD

This study adopts a quantitative approach employing a quasi-experimental design to examine the effectiveness of the contextual learning approach on vocational school students' learning outcomes. Specifically, a pretest–posttest control group design was implemented, involving two intact classes assigned to the experimental and control groups, respectively (Campbell & Stanley, 2015; Creswell & Creswell, 2017). The research population is all students of class X at SMK Darul Amin Madura. The sample was selected using a purposive sampling technique by considering the equality of initial ability, the background of the students, as well as the similarity of the teaching teacher and the allocation of learning time. The experimental group and the control group each consisted of 40 students.

The research instrument is in the form of a learning outcome test that measures conceptual understanding and the ability to apply knowledge in a vocational context (Fraenkel & Wallen, 1990). The test is prepared based on competency indicators and is used at the pretest and posttest stages with equivalent question items. In addition, observation sheets are used to monitor the implementation of learning. The research procedure began with the provision of a pretest to both groups. The experimental group was then given contextual learning treatment, while the control group followed conventional learning. The treatment was carried out over four meetings in the September–October 2025 period, with the same learning duration in both groups. After treatment, a posttest is given to measure the improvement in learning outcomes (Mertler, 2024).

The validity of the instrument is guaranteed through a content validity test by an expert, while the reliability is tested using the appropriate reliability coefficient. The data were analyzed using inferential statistical techniques, beginning with tests of normality and homogeneity. Differences in learning outcomes were examined using an independent samples t-test or analysis of covariance (ANCOVA), with pretest scores treated as covariates. In addition, normalized gain (N-gain) analysis was conducted to assess the magnitude of improvement in learning outcomes. All analyses were carried out at a significance level of 0.05 (Egbert & Staples, 2019; Hake, 1998).

RESULT AND DISCUSSION

3.1 Descriptive Statistics of Learning Outcomes

Data analysis begins with testing statistical assumptions to ensure the feasibility of using parametric analysis. The normality test using Kolmogorov–Smirnov showed that the distribution of pretest and posttest scores in both the experimental and control groups was in the normal category ($p > 0.05$). In addition, the variance homogeneity test using the Levene test showed that the variance between groups was homogeneous ($p > 0.05$). The fulfillment of these two assumptions shows that the data meets the statistical prerequisites for parametric inferential analysis, so that the results of subsequent tests can be interpreted validly and reliably.

Table 1. Descriptive Statistics of Pretest and Posttest Scores

Group	N	Pretest (M ± SD)	Posttest (M ± SD)
Experimental (CTL)	40	61,45 ± 7,82	84,30 ± 6,91
Control (Conventional)	40	60,10 ± 8,05	75,20 ± 7,43

An analysis of students' initial abilities is carried out to ensure that the differences in learning outcomes that appear in the final stage are really caused by learning treatments, not by differences in initial abilities. The results of the independent samples t-test on the pretest score showed a value of $t = 0.84$ with a significance of $p > 0.05$, indicating that there was no significant difference between the experimental group and the control group before the treatment was given. These findings suggest that both groups were at relatively equal initial levels of ability, thus providing a solid basis for conducting a fair and controlled comparison of treatment effects (Fraenkel & Wallen, 1990).

Table 2. T-Test of Pretest Scores between the Experimental and Control Groups

Statics	Score
t	0,84
df	78
Sig. (p)	0,403

3.2. Differences in Learning Outcomes After the Treatment

Following the implementation of the learning intervention over four instructional sessions, analysis of posttest scores revealed a statistically significant difference between the experimental and control groups. The mean posttest score of the experimental group exceeded that of the control group, which indicated a greater improvement in learning outcomes in students who participated in contextual learning. The results of the independent samples t-test showed a value of $t = 3.27$ with a significance level of $p < 0.01$. Statistically, these results show that the difference in learning outcomes between groups does not occur by chance, but rather reflects the real influence of the learning approach applied.

Table 3. T-Test of Pretest Scores between the Experimental and Control Groups

Statics	Score
t	3,27
df	78
Sig. (p)	0,002

3.3. Result of Ancova Test

To strengthen causal inference and control the potential influence of students' initial abilities, follow-up analysis was carried out using analysis of covariance (ANCOVA) with pretest scores as covariates. ANCOVA results showed that the learning approach had a significant influence on learning outcomes after the difference in initial ability was controlled ($F = 10.84$; $p < 0.01$). The partial eta squared value indicates the size of the effect in the medium to large category, which indicates that the contextual learning

approach makes a meaningful contribution to the variation in student learning outcomes. The use of ANCOVA in this context strengthens the results of the t-test and improves the accuracy of the interpretation of the effects of the treatment (Egbert & Staples, 2019; Hahs-Vaughn, 2024).

Table 4. Ancova Results of Posttest Scores with Pretest as a Covariate

Source of Variation	F	Sig. (p)	Partial η^2
Learning Approach	10.84	0.001	0.122
Pretest (Covariate)	18.37	0.000	0.191

3.4. Result of N-gain Score

In addition to analyzing the difference in final scores, learning effectiveness was also reviewed through an analysis of improved learning outcomes using normalized gain (N-gain). The results showed that the experimental group obtained an average N-gain value of 0.67, which was in the medium-high category, while the control group obtained an average N-gain value of 0.38, which was in the medium category. This difference in N-gain levels shows that contextual learning not only results in higher final scores, but also provides a more substantial learning improvement than conventional learning (Hake, 1998).

Table 5. Mean N-gain of Learning Outcomes

Group	N-gain (M)	Category
Experimental (CTL)	0.67	Moderate-High
Control (Conventional)	0.38	Moderate

In more detail, higher N-gain values in the experimental group indicated that learners were able to utilize contextual learning more effectively to construct conceptual understanding and apply knowledge applied in relevant contexts. This is reflected in the large proportion of the score increase achieved compared to the maximum possible potential improvement. In contrast, although the control group also experienced an improvement in learning outcomes, the rate of improvement was relatively lower, suggesting that conventional learning is less than optimal in encouraging improvement in deep understanding.

Overall, the statistical analyses consistently indicate that the contextual learning approach exerts a positive and statistically significant effect on vocational school students' learning outcomes. This consistency can be seen from various analysis indicators, ranging from the equivalence of initial ability, significant differences in posttest scores, strengthening of results through ANCOVA, to the level of learning improvement based on N-gain analysis. These findings provide strong empirical evidence that learning that links material to the real context and the world of work can improve the quality of learning outcomes in vocational education more effectively than conventional learning approaches.

DISCUSSION

The principal findings of this study indicate that the contextual learning approach leads to significantly greater improvements in vocational school students' learning outcomes compared to conventional instructional methods. These results directly answer the research objectives and support the hypothesis proposed, namely that contextual learning has a positive influence on learning outcomes. These advantages were consistently demonstrated through differences in posttest scores, ANCOVA results after controlling initial ability, and higher levels of learning improvement in the experimental group.

The main meaning of this finding lies in the role of real context in strengthening the learning process of vocational school students. Contextual learning allows learners to relate academic concepts to relevant vocational situations, so that knowledge is not

learned in the abstract, but rather built through meaningful experiences. In vocational education, this approach is important because the expected learning outcomes are not only in the form of mastery of concepts, but also the ability to understand and apply knowledge in real work situations. Thus, the improvement in learning outcomes found in this study reflects the success of learning in bridging the gap between theory and practice.

The results of this study are aligned with constructivist theoretical assumptions, which posit that meaningful learning emerges when learners actively construct knowledge through interaction with their environment and engagement in authentic experiences. Moreover, these findings corroborate prior empirical studies demonstrating the effectiveness of contextual and active learning approaches in enhancing conceptual understanding and facilitating knowledge transfer. The study of (Aydin-Ceran, 2021; Dewi & Primayana, 2019; Suryawati & Osman, 2017) for example, shows that contextual learning produces higher learning outcomes than traditional learning. Similarly, a study by (Khotimah, 2016; Ritonga & Azis, 2022; Winarso & Haqq, 2020) confirms that context-based learning and problem-solving support more profound conceptual change. The alignment of these findings with the literature suggests that the results of the research are scientifically acceptable and reinforce the existing empirical evidence.

However, this research also makes a new contribution to the existing research treasure. In contrast to most previous studies that focused on general education or higher education, this study specifically examines the context of vocational schools that have vocational learning characteristics. In addition, learning outcomes are not only seen as general academic achievements, but as indicators of understanding and applying knowledge relevant to the vocational context. Thus, this study expands the understanding of the effectiveness of contextual learning in the realm of vocational education which is still relatively limited in the international literature.

Alternative explanations for the findings of this study need to be considered. One possibility is the increased motivation and learning engagement of students in the experimental group due to the use of more varied and contextual learning activities. These engagement factors can contribute to improved learning outcomes, regardless of the learning approach itself. In addition, the role of teachers in implementing contextual learning also has the potential to affect outcomes, especially if teachers have higher pedagogical competence in managing context-based learning activities. Nonetheless, the use of ANCOVA and the equivalence of students' initial abilities reinforce the belief that differences in learning outcomes are primarily influenced by the learning approaches applied.

The implications of the findings of this study are theoretical and practical. Theoretically, this study strengthens the argument that contextual learning is a relevant and effective approach to improve learning outcomes in vocational education. Practically, these findings provide an empirical basis for vocational teachers to integrate the context of the world of work, vocational case studies, and real problem-solving in the learning process. Although this study shows significant results, limitations in the quasi-experimental design and scope of research in a single school need to be noted. Therefore, further research is recommended to involve more diverse vocational school contexts, use stronger experimental designs, and develop learning outcome measurements that include vocational performance assessments.

CONCLUSION

The findings of this study demonstrate that the contextual learning approach plays a significant role in enhancing the quality of vocational school students' learning outcomes by effectively connecting instructional content with authentic contexts and the practical demands of the workplace. Learning that is contextually designed has been proven to be able to encourage more meaningful and applicable understanding than conventional

learning, thereby answering the main challenges of vocational education which has tended to experience a gap between theory and practice. Thus, this study makes a real contribution in strengthening the argument that contextual learning is a relevant and effective pedagogical approach to the characteristics of vocational education. The significance of this study lies in its contribution to expanding empirical evidence on the effectiveness of contextual learning within vocational school settings, an area that remains underrepresented in the international literature. These findings extend and reinforce prior research on contextual learning by situating its effects explicitly within vocational education contexts. From a practical perspective, the results provide a robust foundation for vocational teachers and education administrators to design learning strategies that are more meaningful, relevant, and oriented toward strengthening students' competencies. More broadly, this study underscores the importance of a paradigm shift from traditional knowledge transmission models toward contextual learning as a strategic approach to enhancing the quality and relevance of vocational education

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