THE EFFECTIVENESS OF PROJECT-BASED LEARNING ON STUDENTS' SPEAKING SKILLS AT ELEVENTH GRADE OF SMK PANCA BHAKTI BANJARNEGARA

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ABSTRAK

Keterampilan berbicara merupakan salah satu keterampilan berbahasa yang paling kompleks karena menuntut penguasaan kosakata, tata bahasa, pelafalan, serta kepercayaan diri untuk berkomunikasi secara spontan. Observasi awal di SMK Panca Bhakti Banjarnegara menunjukkan bahwa kelancaran berbicara bahasa Inggris siswa kelas XI masih rendah akibat kurangnya rasa percaya diri, minimnya latihan, dan dominasi pembelajaran yang berpusat pada guru. Penelitian ini bertujuan menguji efektivitas Project-Based Learning (PjBL) berbasis poster biografi dalam meningkatkan kelancaran berbicara siswa. Penelitian menggunakan desain true experimental pretest-posttest control group yang dipadukan dengan pendekatan kualitatif deskriptif (embedded mixed-methods). Sampel terdiri atas 37 siswa kelas eksperimen dan 37 siswa kelas kontrol yang dipilih melalui cluster random assignment. Data dikumpulkan melalui tes berbicara, lembar observasi, dan wawancara guru. Hasil uji-t sampel independen menunjukkan perbedaan signifikan pada skor pascates kedua kelompok ($p < 0,001$), dengan rerata kelas eksperimen 86,14 dibanding kelas kontrol 75,57. Nilai N-Gain kelas eksperimen (0,57) berkategori sedang, jauh melampaui kelas kontrol (0,27) yang berkategori rendah. Temuan kualitatif memperkuat hasil tersebut melalui peningkatan partisipasi, kepercayaan diri, kolaborasi, dan komunikasi siswa. Disimpulkan bahwa PjBL efektif meningkatkan kelancaran berbicara siswa SMK.

Kata Kunci: Project-Based Learning, Kelancaran Berbicara, Pembelajaran Berbasis Proyek, Smk, Mixed-Methods.

ABSTRACT

Speaking is widely regarded as the most complex language skill because it requires vocabulary mastery, grammatical accuracy, pronunciation, and the confidence to communicate spontaneously. Preliminary observation at SMK Panca Bhakti Banjarnegara revealed that the English speaking fluency of eleventh-grade students remained low due to limited confidence, insufficient practice, and teacher-centered instruction. This study examined the effectiveness of Biography-Poster Project-Based Learning (PjBL) in improving students' speaking fluency. A true experimental pretest-posttest control group design was combined with a qualitative descriptive approach within an embedded mixed-methods framework. The sample consisted of 37 students in the experimental class and 37 in the control class, selected through cluster random assignment. Data were collected through speaking tests, classroom observation, and teacher interviews. The independent samples t-test revealed a significant difference in post-test scores between the two groups ($p < 0.001$), with the experimental class achieving a mean of 86.14 compared to 75.57 in the control class. The N-Gain score for the experimental class (0.57) fell into the moderate category, markedly higher than the control class (0.27), which fell into the low category. Qualitative findings reinforced these results through increased participation, confidence, collaboration, and communication. It is concluded that PjBL effectively improves the speaking fluency of vocational high school students.

Keywords: *Project-Based Learning, Speaking Fluency, Project-Based Instruction, Vocational High School, Mixed-Methods.*

INTRODUCTION

English is an international language that plays an important role in various aspects of life, including education and the world of work. As a compulsory subject at every level of education in Indonesia, including vocational high schools (SMK), English is expected to equip students with effective oral and written communication skills to face the demands of the workplace and globalization (Adi Purwanto et al., 2025).

Among the four language skills, speaking is regarded as the most complex because it requires vocabulary mastery, grammatical accuracy, pronunciation, and the ability to convey ideas spontaneously and confidently (Brown, 2007; Luoma, 2004). Fluency in particular tends to receive less attention in classroom instruction than accuracy (Tavakoli & Hunter, 2018), even though limited vocabulary, anxiety, and insufficient opportunities to practice remain major obstacles to the development of students' speaking fluency (Leong & Ahmadi, 2017; Derakhshan et al., 2016).

Based on preliminary observation and interviews with the English teacher at SMK Panca Bhakti Banjarnegara, the speaking fluency of eleventh-grade students was found to be generally low to moderate. Students tended to understand the material passively, experienced long pauses and frequent use of filler words ("eee", "mmm") when speaking, often switched to Indonesian due to limited vocabulary, and displayed low confidence, particularly when asked to perform in front of the class. Instruction that remained dominated by conventional, teacher-centered methods further limited students' opportunities to practice speaking authentically, even though students tended to prefer more active and contextual learning.

To address this problem, a learning model was needed that could actively engage students in a meaningful communicative process. Project-Based Learning (PjBL) is an approach that positions students as active subjects in seeking and applying knowledge through real activities (Bell, 2010; Guo et al., 2020). Through PjBL, students repeatedly discuss, negotiate, solve problems, and present the results of their work, thereby creating an authentic communicative context that differs from conventional speaking drills, which often feel artificial. In the context of English language learning, the implementation of Biography-Poster Project-Based Learning can serve as an innovative alternative, in which students work in groups to research a particular figure, write a short biography, design an English-language poster, and present their results in front of the class.

The choice of the biography-poster format as the project outcome was also based on the consideration that researching a figure, composing a biographical narrative, and presenting it orally requires students to use English at multiple stages: while gathering information, discussing findings with group members, composing the poster text, and answering audience questions during the presentation. This sequence of activities naturally creates repeated speaking practice in a meaningful context, which several studies identify as a key factor in improving foreign-language learners' speaking fluency.

Previous studies indicate that PjBL contributes positively to students' speaking skills. Suryani and Argawati (2023) found that PjBL combined with ICT can improve students' speaking skills; We (2022) and Purnama Sari et al. (2025) reported that PjBL effectively improves students' speaking skills across various educational levels; Menggo et al. (2023) showed that PjBL can prepare students' interpersonal communication skills in speaking courses in Indonesia; while Rampeng et al. (2025) confirmed that integrating PjBL with deep-learning principles can foster speaking fluency and critical thinking among EFL students. Nevertheless, empirical research on the effectiveness of Biography-Poster PjBL in the context of vocational high school students, particularly at SMK Panca Bhakti

Banjarnegara, had not previously been conducted.

Furthermore, most prior studies tend to rely solely on quantitative data in the form of pretest-posttest scores to measure the effectiveness of PjBL, while the process and students' experiences during learning have not been explored in depth. Yet understanding how and why the improvement occurs is just as important as knowing its magnitude. Therefore, this study adopts an embedded mixed-methods design (Creswell, 2018), which combines primary quantitative data (pretest-posttest scores) with secondary qualitative data from classroom observation and semi-structured interviews to provide a more comprehensive understanding of the effect of PjBL on students' speaking fluency. This approach also addresses a gap in previous research, which has rarely integrated data on the learning process with learning outcomes in a systematic manner.

Based on the description above, this study aims to: (1) examine whether there is a significant difference in students' speaking fluency before and after the implementation of PjBL; (2) measure how effective the implementation of Biography-Poster PjBL is in improving the speaking fluency of eleventh-grade students at SMK Panca Bhakti Banjarnegara compared to the conventional method; and (3) describe the changes in student behavior and the teacher's perception of the PjBL implementation process. The results of this study are expected to provide an empirical contribution to the development of English speaking instruction strategies in vocational high schools, while enriching the literature on the implementation of creative project-based learning in the context of vocational education in Indonesia.

METHOD

This study employed a true experimental approach with a pretest-posttest control group design, combined with a qualitative descriptive approach within an embedded concurrent mixed-methods design (Creswell, 2018). This design was chosen because the study prioritized quantitative data from the experiment (pretest and posttest) to measure the effect of PjBL on students' speaking skills, while qualitative data were collected concurrently to strengthen and enrich the understanding of the students' process and behavior during learning. The study involved two groups: an experimental group that received instruction through PjBL, and a control group that received instruction using the conventional method typically used by the teacher. The effectiveness of PjBL was identified through the difference between the pretest and posttest results of the two groups.

The study was conducted at SMK Panca Bhakti Banjarnegara, Central Java, in the 2025/2026 academic year. The population consisted of all eleventh-grade students, while the sample was determined through cluster random assignment involving two classes with relatively equivalent characteristics, namely XI TKJ 5 and XI TKJ 6, each consisting of 37 students. Based on the results of the draw, class XI TKJ 6 was designated as the experimental class implementing PjBL, while XI TKJ 5 served as the control class using the conventional method.

Data were collected through three techniques: interviews, tests, and behavioral observation. Semi-structured interviews were conducted with the English teacher prior to the study to obtain an initial picture of students' speaking ability, the difficulties they faced, and the teaching methods typically used. Observation was carried out throughout the treatment process to monitor student behavior, covering the aspects of participation, confidence, collaboration, communication, and involvement in the project, using an observation sheet consisting of 20 behavioral indicators. A speaking test served as the main instrument to measure students' speaking fluency at the pretest and posttest stages, using

procedural text material that students explained orally in English.

Speaking fluency was assessed using a rubric modified from Harris's Oral English Rating Scale (Harris, 1969), covering five aspects: smoothness of speech, speed of speech, hesitation, confidence in speaking, and continuity of communication, each with a maximum score of 20, for a total maximum score of 100. Scores were classified into five categories: Very Good (81-100), Good (61-80), Fair (41-60), Poor (21-40), and Very Poor (0-20). The validity of all instruments — the interview guideline, the observation sheet, the speaking test, and the assessment rubric — was established through expert judgment by the supervising lecturer and validators with expertise in English language education.

The data collection procedure consisted of four stages: (1) preparation, including instrument validation and determination of the experimental and control classes; (2) pretest, to measure students' initial speaking fluency along with initial behavioral observation; (3) implementation of the PjBL treatment in the experimental class following Thomas's (2000) six stages — start with the essential question, design a plan for the project, create a schedule, monitor the students and the progress of the project, assess the outcome, and evaluate the experience — while the control class received conventional instruction; and (4) posttest, using the same format and rubric as the pretest to measure the change in students' speaking fluency after the treatment.

Quantitative data analysis included descriptive statistics, the Shapiro-Wilk normality test (because the sample size was ≤ 50), Levene's homogeneity test, an independent samples t-test to compare scores between groups, a paired samples t-test to compare pretest and posttest scores in the experimental class, and Normalized Gain (N-Gain) analysis based on Hake's (1999) criteria: high ($g \geq 0.70$), moderate ($0.30 \leq g < 0.70$), and low ($g < 0.30$). Qualitative data from observation and interviews were analyzed using the interactive technique of Miles, Huberman, and Saldaña (2014), comprising data condensation, data display, and conclusion drawing/verification. The quantitative and qualitative data were then integrated at the interpretation stage to provide a more complete picture of the process and outcomes of PjBL implementation. The implementation of PjBL was considered successful if: (1) the independent samples t-test on the posttest showed a significance of $p < 0.05$; (2) the mean N-Gain of the experimental class fell into the moderate or high category and was higher than that of the control class; and (3) at least 80% of students in the experimental class demonstrated active engagement during learning based on the observation results.

RESULTS AND DISCUSSION

Before the treatment was implemented, preliminary interviews with the English teacher revealed that the speaking fluency of eleventh-grade students was generally low to moderate. The teacher reported that students tended to understand the material passively but struggled when required to speak, frequently switched to Indonesian due to limited vocabulary, experienced many pauses and filler words, and displayed low confidence, particularly when performing in front of the class. These findings confirmed the need for a learning intervention that could provide an authentic communicative context, leading to the selection of Biography-Poster PjBL as the intervention.

Table 1 presents the descriptive statistics of the pretest and posttest for both groups based on the Modified Harris's Oral English Rating Scale (1969), with a maximum score of 100.

Table 1. Descriptive Statistics of Pretest and Posttest

Group	Mean Pretest	Mean Posttest	Pretest Score Range	Posttest Score Range
Experimental	66.95	86.14	56 - 76	72 - 96
Control	65.89	75.57	57 - 76	66 - 86

The pretest mean of the experimental class (66.95) and the control class (65.89) fell within a nearly identical range, indicating that both groups had equivalent initial abilities before the treatment. This was supported by the results of the independent samples t-test on the pretest data, which showed no significant difference ($p > 0.05$), thereby fulfilling the requirement of initial equivalence for a true experimental design. The Shapiro-Wilk normality test showed that all pretest and posttest data for both groups were normally distributed ($p > 0.05$): experimental pretest ($p = 0.413$), control pretest ($p = 0.137$), experimental posttest ($p = 0.303$), and control posttest ($p = 0.632$). Levene's homogeneity test also showed that the posttest variances of the two groups were homogeneous ($p = 0.367$), so that parametric t-tests could be applied in the subsequent analysis.

A summary of the main statistical test results is presented in Table 2.

Table 2. Summary of Statistical Test Results

Test	Statistic	Significance (p)	Result
Independent t-test, Pretest (Experimental vs Control)	-	$p > 0.05$	Not significant
Independent t-test, Posttest (Experimental vs Control)	$t = 8.630$ (df=72)	$p < 0.001$	Significant
Paired t-test, Pretest-Posttest (Experimental)	$t = -17.327$ (df=36)	$p < 0.001$	Significant
N-Gain, Experimental Class	0.57	Moderate	-
N-Gain, Control Class	0.27	Low	-

The independent samples t-test on the posttest data showed a t-value of 8.630 with df = 72 and a significance of $p < 0.001$, indicating a significant difference between the posttest scores of the experimental and control classes. The posttest mean of the experimental class (86.14) was higher than that of the control class (75.57), with a mean difference of 10.57 points. The paired samples t-test in the experimental class showed a t-value of -17.327 with df = 36 and a significance of $p < 0.001$, indicating a significant difference between the pretest and posttest scores of students in the experimental class after the implementation of PjBL. The N-Gain analysis showed a mean of 0.57 (moderate category) for the experimental class, compared to only 0.27 (low category) for the control class.

Based on the score category distribution, at pretest 97.3% of students in the experimental class were in the Good category and 2.7% were in the Fair category; after the treatment, 86.5% of students moved up to the Very Good category and the remaining 13.5% stayed in the Good category with higher scores, with not a single student remaining in the Fair category. In contrast, in the control class, the posttest category distribution did not change much, with 97.3% of students remaining in the Good category and only 2.7% reaching the Very Good category. All five aspects of speaking fluency (smoothness of speech, speed, hesitation, confidence, and continuity of communication) in the experimental class showed a relatively balanced improvement, ranging from 18.66 to 19.59 points (28-31%), with no aspect showing a decline.

Qualitative findings reinforced these quantitative results. Teacher interviews revealed three main themes: (1) low confidence and high hesitation among students at the initial stage, consistent with the low pretest scores on the hesitation and confidence aspects; (2) a

marked improvement in students' willingness to speak and to sustain communication after the treatment; and (3) the teacher's positive perception of PjBL as an effective and engaging method for teaching speaking.

Observation of 20 behavioral indicators grouped into five aspects showed progressive improvement across the six treatment sessions, as presented in Table 3.

Table 3. Recapitulation of Observation Indicator Development

Aspect	**Session 1 (%)**	**Session 3 (%)**	**Session 6 (%)**	**Gain**
Participation	56.8	74.3	92.6	+35.8%
Confidence	34.5	57.4	87.8	+53.3%
Collaboration	64.2	79.1	93.2	+29.0%
Communication	32.4	54.1	85.8	+53.4%
Involvement	45.3	69.6	93.2	+47.9%
Overall Average	**46.6**	**66.9**	**90.5**	**+43.9%**

The overall average of the indicators increased from 46.6% in the first session to 90.5% in the sixth session (a gain of +43.9%). The confidence and communication aspects showed the largest increases, at +53.3% and +53.4% respectively, while the collaboration aspect consistently recorded the highest percentage in every session (64.2%-93.2%), indicating that the group-work format of PjBL was highly compatible with students' learning character.

Discussion

The equivalence of initial ability between the experimental and control classes at the pretest stage is an important prerequisite in a true experimental design, as it ensures that the difference in results at the posttest stage is genuinely attributable to the treatment rather than to differences in students' initial ability (Creswell, 2018). The very small difference in pretest means (1.06 points) and the non-significant t-test result confirm that the internal validity of this study was maintained, so that the improvement observed in the experimental class can be confidently attributed to the implementation of PjBL.

The significant increase in the experimental class's posttest score (from 66.95 to 86.14) confirms that Biography-Poster PjBL effectively improves the speaking fluency of vocational high school students. This finding is consistent with the view that PjBL positions students as active subjects who construct knowledge through real activities, thereby encouraging more meaningful language use (Bell, 2010; Guo et al., 2020). The balanced improvement across all five aspects of speaking fluency further indicates that the benefits of PjBL are not limited to a single component of speaking but have a comprehensive impact on students' oral performance. This is consistent with Thomas's (2000) six stages of PjBL — formulating the essential question, planning, organizing, investigating, presenting, and evaluating the project — which sequentially provide opportunities for speaking practice at nearly every stage of learning.

The comparison with the control class further strengthens this conclusion. Although the control class also showed an increase in scores (from 65.89 to 75.57), the magnitude of this increase was far lower than that of the experimental class and was statistically significantly different ($p < 0.001$). This finding indicates that the conventional method, which tends to be teacher-centered, provides limited room for students to actively practice speaking, whereas PjBL provides an authentic communicative context through project planning, negotiation, and presentation activities.

The results of the N-Gain analysis provide insight into the practical significance of this intervention, beyond mere statistical significance. The moderate category for the experimental class (0.57) compared to the low category for the control class (0.27) indicates that PjBL not only produced a statistically significant difference but also a more practically

meaningful and evenly distributed improvement among students in the experimental class (Hake, 1999).

The integration of the quantitative and qualitative findings in this study provides a more complete understanding of the process behind this improvement in scores. Before the implementation of PjBL, the teacher reported that students tended to be passive, hesitant, and lacked confidence when asked to speak English. After the treatment, the observed behavioral changes — increased participation, confidence, collaboration, and communication — were consistent with the quantitative score improvements, particularly in the confidence and hesitation aspects, which had been students' weakest points at the outset. This consistency between behavioral and test data indicates that the improvement in learning outcomes occurred not only in the cognitive domain but also in the affective and social domains of the students.

This finding is consistent with Suryani and Argawati's (2023) study, which found that PjBL can improve students' speaking skills through active, collaborative, and communicative learning activities, as well as Sarosa's (2017) study, which found that project-based learning can improve students' confidence, participation, and speaking fluency because it provides broader opportunities to use English directly. Theoretically, this result also reinforces the notion that limited vocabulary and speaking anxiety (Leong & Ahmadi, 2017; Derakhshan et al., 2016) can be mitigated through instruction that offers repeated, naturally occurring speaking practice within a project context, rather than through artificial, isolated speaking drills.

The practical implications of this finding are broad for English instruction in vocational high schools. Teachers can adapt the stages of PjBL — from formulating the essential question through to presenting and evaluating the project — to other teaching materials besides biography, such as descriptive or narrative texts, as long as a tangible product requiring oral presentation is still produced. Heterogeneous grouping, as reflected in the high collaboration scores in the observation results, also needs attention so that students with low confidence still have room to practice speaking without feeling overwhelmed by more dominant group members. Furthermore, the success of PjBL in this study underscores the importance of the teacher's role as a facilitator rather than merely a source of information, giving students the freedom to construct their own understanding and speaking skills through authentic project experience.

Although the results of this study are convincing, several limitations should be noted. First, this study focused solely on the fluency aspect of speaking, while other aspects such as pronunciation, grammar, and vocabulary were not analyzed in depth. Second, the study was conducted at a single school with a limited sample size (74 students), so generalization of the results to broader contexts should be made with caution. Third, the relatively short duration of the treatment (six sessions) may have introduced a novelty effect, whereby part of the improvement in student performance was influenced by enthusiasm for a new learning method rather than by PjBL alone.

Overall, the findings of this study provide evidence that the implementation of Biography-Poster Project-Based Learning not only statistically improves students' speaking fluency but also creates a more active, meaningful, and student-centered learning process. Therefore, this instructional model is worthy of recommendation as an alternative for teaching English speaking skills in vocational high schools.

CONCLUSION AND SUGGESTIONS

Based on the quantitative and qualitative data analysis, it can be concluded that the implementation of Biography-Poster Project-Based Learning (PjBL) effectively improves the speaking fluency of eleventh-grade students at SMK Panca Bhakti Banjarnegara. This is evidenced by: (1) a significant difference between the pretest and posttest scores of the experimental class ($p < 0.001$); (2) a significant difference between the posttest results of the experimental and control classes ($p < 0.001$), with the experimental class mean (86.14) higher than the control class (75.57); and (3) an N-Gain score for the experimental class (0.57) in the moderate category, far exceeding the control class (0.27), which fell into the low category. These quantitative findings were reinforced by qualitative data showing increased participation, confidence, collaboration, communication, and involvement among students throughout the learning process, as well as the teacher's positive perception of the implementation of PjBL. Thus, Biography-Poster PjBL provides an authentic and meaningful communicative context that encourages students to practice speaking English more actively and confidently than the conventional method.

Based on these conclusions, several suggestions can be proposed. For English teachers, Biography-Poster PjBL can be used as an alternative, more varied speaking instruction strategy, with attention to time management and the distribution of group tasks so that all students receive equal opportunities to speak. For students, it is recommended that they make use of project activities as a means of continuously building confidence and speaking fluency, not only during classroom learning. For future researchers, it is recommended that the scope of research be expanded to include other aspects of speaking skills, such as pronunciation, grammar, and vocabulary, that the treatment duration be extended, and that samples from multiple schools be involved to improve the generalizability of the findings

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