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Enhancing Culinary Students' Comprehension of English Recipe Texts through Project-Based Learning

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Abstract

This study investigates the effectiveness of Project-Based Learning (PjBL) in enhancing reading comprehension of English culinary texts among tenth-grade vocational culinary students at SMK Miftahul Ulum Solokuro. Employing a one-group pretest-posttest design, 28 students participated in four project-based sessions focused on understanding and applying English recipe texts. The results showed a statistically significant improvement, with average scores increasing from 48.5 (pre-test) to 83.68 (post-test). The paired-sample t-test revealed a p-value of 0.000, and the effect size measured by Cohen's d was 3.74, indicating a very large effect. These findings highlight PjBL's effectiveness in bridging the gap between academic English reading and real-world culinary practices. By contextualizing learning through projects, students not only improved their reading comprehension but also acquired essential skills for workplace readiness in the culinary industry.

Keywords: Project-Based Learning, Reading Comprehension, Vocational Education, English Culinary Texts

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INTRODUCTION

Modern education must respond to the increasing complexity of today's global challenges. Beyond the transmission of knowledge, it is now expected to cultivate students' full potential through relevant and adaptive pedagogical approaches. In vocational education, particularly in culinary programs, learning must not only build academic competence but also equip students with practical literacy, including the ability to comprehend specialized texts in English. In this context, language learning is no longer an abstract endeavor—it must be contextualized to meet students' professional needs.

Reading comprehension plays a central role in supporting vocational success. Culinary students, for instance, are frequently exposed to English-language materials such as recipes, menus, standard operating procedures (SOPs), and food safety guidelines. However, many struggle to fully grasp the linguistic and technical content

due to limited vocabulary, lack of exposure, and disengaging teaching methods. Sweller (2003) emphasized that such challenges in processing technical information can lead to cognitive overload, reducing students' ability to perform tasks effectively. Moreover, McNamara and Kintsch (1996) argued that reading comprehension involves not only decoding but also the construction of meaning from text using prior knowledge—a skill that becomes essential when interpreting complex culinary instructions.

Unfortunately, English instruction in vocational schools often remains detached from real-life practice. Students are expected to read texts that bear little relevance to their future careers. This disconnect has led to widespread disengagement and low language retention, particularly in culinary programs where immediate application of textual understanding is required for successful execution of cooking tasks.

One promising solution is Project-Based Learning (PjBL), which immerses students in real-world projects that require them to analyze, synthesize, and apply textual information. Rooted in Dewey's (1938) educational philosophy, PjBL emphasizes experiential learning as a process of meaningful experience construction. Dewey believed that education must relate directly to students' lived experiences and future aspirations. This idea is echoed in Vygotsky's (1978) concept of the Zone of Proximal Development (ZPD), which highlights the role of social interaction and scaffolding in learning. Similarly, Piaget (1952) asserted that learners actively construct knowledge through engagement with their environment. When students are given the opportunity to work on projects that reflect professional tasks—such as analyzing English recipes, preparing dishes, or presenting culinary procedures—their motivation and comprehension are significantly enhanced.

Although previous research has explored the benefits of PjBL in general education settings, there remains a gap in its application within vocational culinary contexts. Most existing studies do not account for the specialized nature of reading in culinary education, where understanding the text directly affects students' ability to perform kitchen procedures, follow safety protocols, and engage in international work environments. Therefore, it is crucial to examine how PjBL can support culinary students in bridging the gap between language learning and vocational literacy.

This study seeks to investigate the effectiveness of PjBL in improving reading comprehension of English culinary texts—specifically recipe texts—among tenth-grade students at SMK Miftahul Ulum Solokuro. It aims to determine whether engaging students in contextualized projects can enhance their ability to understand and apply information from specialized English materials. In doing so, the research also addresses a broader question: how can we design language instruction that aligns with the competencies required in vocational fields, particularly culinary arts?

METHOD

This study employed a quantitative pre-experimental design with a one-group pretest-posttest format. This design was chosen to examine the effectiveness of Project-Based Learning (PjBL) in enhancing students' reading comprehension of English-language culinary texts. According to Creswell (2014), pre-experimental

designs are suitable for measuring the effect of an intervention in situations where random assignment and control groups are not feasible.

The core idea of this design is to compare students' performance before and after the PjBL intervention to determine whether a statistically significant improvement occurred. While this design lacks a comparison group, it remains appropriate for preliminary investigations into instructional effectiveness within a specific and limited educational setting, such as a single vocational classroom.

Population and Sampling Technique

The population of this study consisted of all tenth-grade students enrolled in the Culinary Arts program at SMK Miftahul Ulum Solokuro during the 2024/2025 academic year. The total number of students in the class was 20, and all students participated in the research.

A total sampling technique was employed, meaning that the entire population was used as the research sample. This approach is justified in cases where the population is relatively small and accessible (Etikan, Musa, & Alkassim, 2016). Using total sampling ensured that the findings would be directly reflective of the specific educational environment without bias from selective inclusion.

Instruments and Data Collection

The primary instrument used in this study was a Reading Comprehension Test tailored to culinary English texts. The test was developed based on authentic English recipes and procedural texts commonly used in culinary instruction. The test items measured various reading skills, including:

- Identification of key vocabulary and ingredients.
- Understanding of sequencing and preparation steps.
- Interpretation of cooking instructions and measurements.
- Inference and comprehension of procedural meaning.

The test was administered twice: once as a pretest before the intervention and once as a posttest after the completion of PjBL sessions. Each version consisted of 25 items (25 multiple choice), validated through expert judgment by English and culinary educators.

To assess validity, the test underwent content validation using a review process with two subject matter experts. Reliability was tested through a pilot test with students from another similar class (outside the sample), yielding a Cronbach's Alpha value of 0.83, which indicates high internal consistency.

Project-Based Learning Implementation

The PjBL intervention spanned over four sessions (once a week for one month), each lasting approximately 90 minutes. The implementation followed the standard six phases of PjBL as proposed by Thomas (2000), adapted to the culinary English context:

1. Start with a Driving Question: Each session began with a challenge such as "How can we cook and describe an English recipe correctly?"

2. Design a Plan for the Project: Students planned their project with guidance, selecting recipes, dividing tasks, and identifying unfamiliar vocabulary.
3. Create a Schedule: A timeline was set for reading, discussion, cooking practice, and presentation.
4. Monitor the Students and the Progress of the Project: Teachers facilitated group discussions, provided scaffolding, and encouraged English use during tasks.
5. Assess the Outcomes: Students' performance was assessed through rubric-based evaluation (fluency, vocabulary use, comprehension accuracy).
6. Evaluate the Experience: Each session closed with reflection activities, where students shared what they learned and how they applied reading strategies.

Examples of projects included:

- Translating and adapting English recipes (e.g., ice tea, sandwiches).
- Creating and demonstrate the recipes with English procedural texts.
- Presenting a step-by-step cooking demo using English.
- Reflecting in learning journals on challenges in interpreting recipe instructions.

Ethical Considerations

The research was conducted with strict adherence to ethical standards. Written permission was obtained from the school principal and the English teacher. Additionally, informed consent forms were distributed and signed by all participants and their parents or guardians, since the participants were minors. Confidentiality and voluntary participation were assured. The students were informed that their academic grades would not be affected by their participation or responses.

Data Analysis Technique

The data collected from the reading comprehension tests were analyzed using paired-sample t-tests through SPSS to determine whether the difference between pretest and posttest scores was statistically significant. The test compared the mean scores of the same participants before and after the intervention.

The hypotheses were formulated as follows:

- H_0 (Null Hypothesis): There is no significant difference between students' reading comprehension scores before and after the PjBL intervention.
- H_1 (Alternative Hypothesis): There is a significant improvement in reading comprehension scores after the PjBL intervention.

A significance level of 0.05 (α = 5%) was used to test the hypothesis. If the p-value obtained was lower than 0.05, the null hypothesis would be rejected.

In addition, Cohen's d was calculated to measure the effect size, indicating the practical significance of the improvement.

Effect sizes were interpreted based on Cohen's thresholds:

- 0.2 = small
- 0.5 = medium
- 0.8 or above = large

This combination of statistical significance (p-value) and effect size (Cohen's d) allowed for a comprehensive understanding of the intervention's impact on students' reading comprehension in culinary English.

Research Limitations

Although the findings are promising, the study has limitations. The absence of a control group means the observed gains cannot be definitively attributed to PjBL alone. Additionally, the small sample size (N = 20) and the setting of a single vocational school may limit generalizability to other contexts. Future research should consider including a control group and expanding to multiple institutions to strengthen external validity.

RESULTS AND DISCUSSION

This study aimed to examine the effectiveness of Project-Based Learning (PjBL) in improving students' reading comprehension of English-language culinary texts. A total of 20 tenth-grade culinary students at SMK Miftahul Ulum Solokuro participated in four PjBL sessions over the course of one month. The students were assessed through a pretest prior to the intervention and a posttest upon its completion.

Table 1. Mean results of Pretest and Postest

Data	Mean	Deviation Standart
Pretest	48.5	6.726812
Posttest	83.68	12.212
Difference	34.5	9.283722

The results indicated a substantial increase in the mean score from the pretest to the posttest. A paired-sample t-test was conducted using SPSS, resulting in a p-value of 0.000, which is well below the significance threshold of 0.05. This suggests that the improvement in reading comprehension after the intervention is statistically significant.

Moreover, the effect size, measured using Cohen's d, was 3.74, which exceeds the threshold for a large effect (≥ 0.8). This indicates a very strong practical impact of PjBL on students' reading skills.

The effectiveness of PjBL can be attributed to its hands-on, collaborative approach, which allowed students to actively engage with English-language recipes in real-life contexts. By combining language learning with culinary tasks, the students were able to apply their knowledge immediately, facilitating deeper understanding and retention. Moreover, the shift from passive to active learning helped students internalize language through meaningful, real-world applications, such as preparing and analyzing recipes in English. These findings underscore the potential of PjBL in bridging the gap between academic learning and workplace applicability, especially in vocational settings where practical skills and language proficiency are both crucial.

Furthermore, the theoretical frameworks of Vygotsky (1978) and Piaget (1952) support the idea that active engagement in contextually meaningful tasks enhances cognitive development. PjBL's focus on collaborative, experiential learning aligns with constructivist principles, emphasizing student-centered learning and social interaction as key components for knowledge construction. This approach, coupled with the contextual relevance of English in the culinary field, made the language learning process not only engaging but also directly applicable to students' future careers in international culinary settings.

While the results of this study are consistent with previous research, it is important to acknowledge that there may be limitations in generalizing these findings to other vocational settings or language learning contexts. Future studies could explore the impact of PjBL on a broader range of vocational disciplines to validate the scalability and versatility of this approach.

Data Analysis and Statistical Findings

The data analysis, including paired t-tests and Cohen's d, confirmed the significant impact of PjBL on students' English reading comprehension. The paired t-test yielded a p-value of 0.000, indicating that the observed improvement in scores was statistically significant. Additionally, the effect size, calculated using Cohen's d, was 3.74, categorizing it as a large effect. This suggests that the PjBL intervention not only had a statistically significant impact but also a substantial practical effect on the students' ability to comprehend English recipes.

Table 2. Data analysis from SPSS (Paired t-test Result)

	Paired Differences					t	df	Sign. (2-tailed)
	Mean	Std. Deviation	Std Error Mean	95% confidence interval of the difference lower	Upper			
Pair Pretest – Postest Score	-34.750	9.525	2.130	-39.208	-30.292	-16.316	19	.000

The strong effect size further supports the argument that PjBL is an effective pedagogical strategy for enhancing reading skills, particularly in specialized fields like culinary arts. Cohen (1988) noted that an effect size of 3.74 signifies a powerful intervention, reinforcing the conclusion that PjBL led to a meaningful improvement in students' language proficiency. These statistical findings are in line with Doppelt (2009), who found that PjBL fosters deeper engagement and understanding, resulting in significant academic improvement.

The significant improvement in students' reading comprehension scores after the implementation of PjBL demonstrates that the method is highly effective in a vocational culinary context. The average increase of over 35 points highlights how learning becomes more meaningful and applicable when students engage with authentic materials related to their field of study.

Several factors contribute to the success of PjBL in this context:

1. Contextual and Authentic Learning

By using real-world materials such as English recipes, students were better able to relate the content to their vocational identity. This aligns with Thomas (2000), who argued that project-based learning enhances comprehension through contextual relevance.

2. Social Interaction and Knowledge Construction

   PjBL encourages group collaboration, discussion, and presentation, all of which support learning through social interaction. This reflects Vygotsky's (1978) theory of the Zone of Proximal Development, where learning is facilitated through social scaffolding.

3. Experiential Learning

   According to Dewey (1938), students learn more effectively through experiences that have direct meaning to them. In this study, students were not only reading texts but also translating, presenting, and enacting recipes in practice.

4. Active Cognitive Engagement

   Piaget (1952) emphasized the role of active engagement with the environment in constructing knowledge. Through PjBL activities such as recipe analysis and cooking demonstrations, students actively processed and applied the information they read.

These findings are in line with Chen and Wang (2022), who found that PjBL significantly improved reading comprehension among vocational high school students. Similarly, Kartika and Junaidi (2022) demonstrated that PjBL enhanced students' engagement and comprehension when learning English for culinary purposes.

In culinary contexts, Harris and Post (2023) reported that integrating English-language recipe reading into project-based activities enabled students to better understand technical vocabulary and procedural accuracy. The results of this study not only reinforce existing literature but also provide additional evidence for the applicability of PjBL in specific vocational programs, particularly in English for Specific Purposes (ESP) settings.

CONCLUSION

This study aimed to investigate the effectiveness of Project-Based Learning (PjBL) in improving reading comprehension of English-language culinary texts among tenth-grade vocational students. Based on the findings, it can be concluded that PjBL is a highly effective instructional approach for enhancing students' comprehension of technical and procedural texts in English, especially those relevant to the culinary field. The statistical analysis revealed a significant increase in students' reading comprehension scores, with a p-value of 0.000 and a very large effect size (Cohen's d = 3.74). These results affirm the central research objective: that PjBL fosters both academic achievement and vocational language competence.

Furthermore, the implementation of PjBL supported the development of essential soft skills—such as teamwork, communication, and critical thinking—which are crucial for success in real-world culinary settings. By engaging students in

contextualized, hands-on projects, the study also demonstrated how language instruction can be directly aligned with workplace literacy and career readiness. In sum, PjBL not only improves reading comprehension but also offers a dynamic, student-centered learning experience that bridges academic learning with vocational application.

RECOMMENDATION

Based on the conclusions drawn from this study, the following recommendations are proposed to strengthen the integration of PjBL in vocational education, particularly within culinary programs:

1. **Curriculum Integration of PjBL**
   Vocational schools should embed PjBL into English language instruction to enhance both language proficiency and domain-specific competencies. Learning activities should be designed to reflect real-world culinary scenarios using authentic English materials.
2. **Teacher Professional Development**
   Teachers must receive training on how to design, implement, and assess project-based instruction, especially for English for Specific Purposes (ESP). Support from educational institutions is essential to build teachers' capacity in contextual pedagogy.
3. **Development of Learning Resources**
   Schools and teachers should develop or adapt learning materials that are tailored to vocational contexts, such as English recipe booklets, visual culinary glossaries, and step-by-step procedural texts.
4. **Use of Technology in PjBL**
   Integrating digital tools—such as video tutorials, cooking apps, and interactive platforms—can enrich PjBL experiences and mirror current industry practices in culinary education.
5. **Collaboration with Industry Partners**
   Establishing partnerships with restaurants, catering services, or culinary experts can provide students with meaningful project experiences that mirror professional expectations. This may include internships, project mentorships, or guest judging of student work.
6. **Scaling and Cross-Program Application**
   The use of PjBL should be explored beyond culinary programs, extending to other vocational disciplines such as hospitality, fashion design, and tourism, where English-language competency is equally important.
7. **Further Research**
   Future studies should investigate the long-term impact of PjBL on students' overall language development and employability. Comparative studies involving control groups or different instructional methods are also recommended to strengthen evidence on PjBL's effectiveness.

Author Contributions
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Conflict of interests

The authors declare no conflict of interest.

REFERENCES

Alemu, A. S., & Dejene, T. (2023). Project-based learning and its impact on enhancing students' critical thinking and reading skills in vocational education. *International Journal of Vocational and Technical Education, 10*(1), 15–27. https://doi.org/10.5897/IJVTE2023.0385

Ayu, L. S., & Hartanto, M. (2022). Project-based learning to improve reading comprehension and practical skills of vocational school students. *Journal of Indonesian Vocational Education, 13*(4), 104–118. https://doi.org/10.21831/jk.v13i4.52789

Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 83*(2), 39–43. https://doi.org/10.1080/00098650903505415

Capraro, R. M., & Capraro, M. M. (2021). Project-based learning: An effective approach to enhance literacy and critical thinking in vocational education. *Journal of Career and Technical Education, 36*(4), 291–310. https://doi.org/10.5328/CTER36.4.291

Chen, S., & Wang, W. (2022). The effect of project-based learning on reading comprehension in vocational high school students. *Journal of Vocational Education and Training, 74*(2), 150–167. https://doi.org/10.1080/13636820.2021.1944562

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Routledge.

Connor, C. M. (2004). Individualized student instruction and reading comprehension. *Scientific Studies of Reading, 8*(4), 305–329. https://doi.org/10.1207/s1532799xssr0804_3

Dewey, J. (1938). *Experience and education*. Macmillan.

Doppelt, Y. (2009). Assessing the effectiveness of a project-based learning approach in developing 21st-century skills. *Interdisciplinary Journal of Problem-Based Learning, 3*(2), 1–12. https://doi.org/10.7771/1541-5015.1061

Fajriyah, N., & Maulidiyah, E. (2020). The effect of project-based learning on literacy skills in vocational students. *Indonesian Journal of Education, 9*(2), 118–129. https://doi.org/10.21009/IJE.092.03

García-Rodríguez, F. J., Ruiz-Rosa, I., & Gutiérrez-Tao, D. (2021). Project-based learning as a tool to foster entrepreneurial competences. *Culture and Education, 33*(2), 316–334. https://doi.org/10.1080/11356405.2021.1903481

Harris, C. S., & Post, K. (2023). Enhancing literacy through project-based learning: A study in culinary education. *Journal of Culinary Education and Practice, 19*(2), 88–103. https://doi.org/10.1080/15428052.2023.11801100

Johnson & Wales University. (2016). Experiential learning in culinary arts. *Culinary Journal, 10*(4), 233–245.

Kartika, S., & Junaidi, M. (2022). Application of project-based learning to improve reading skills in vocational students of culinary expertise program. *Journal of Vocational Education and Learning, 8*(4), 199–212. https://doi.org/10.23887/jpel.v8i4.41273

Krajcik, J. S., & Blumenfeld, P. C. (2020). Project-based learning: A tool for enhancing literacy in vocational education. *Journal of Vocational Education and Training, 72*(4), 448–462. https://doi.org/10.1080/13636820.2020.1721472

Lestari, N., & Prabowo, A. (2023). Improving reading skills through project-based learning in vocational schools for culinary specialties. *Journal of Vocational and Technology Education, 10*(3), 150–163. https://doi.org/10.23887/jvte.v10i3.48271

McNamara, D. S., & Kintsch, W. (1996). Learning from text: Effects of prior knowledge and text coherence. *Discourse Processes, 22*(3), 247–288. https://doi.org/10.1080/01638539609544975

Piaget, J. (1952). *The origins of intelligence in children*. International Universities Press.

Prasetyo, H., & Riani, D. (2023). Application of project-based learning to improve reading skills and material comprehension in vocational schools. *Journal of Indonesian Vocational Education, 17*(3), 204–219. https://doi.org/10.21831/jk.v17i3.64589

Sands, D. S., & Bowers, A. L. (2022). Enhancing literacy and practical skills in culinary education through project-based learning. *Journal of Culinary Education, 21*(2), 132–145. https://doi.org/10.1080/15428052.2022.2091176

Setiawan, A., & Yuniarti, E. (2021). The use of project-based learning model to improve reading skills and practical skills in vocational culinary expertise program. *Journal of Vocational Education, 13*(2), 145–158. https://doi.org/10.21831/jpv.v13i2.45287

Sweller, J. (2003). Evolution of human cognitive architecture. *Psychology of Learning and Motivation, 43*, 215–266. https://doi.org/10.1016/S0079-7421(03)01015-6

Thomas, J. W. (2000). *A review of research on project-based learning*. Buck Institute for Education. https://www.bie.org/research/study/review-research-project-based-learning

Thomas, J. W. (2023). Project-based learning in vocational education: A path to enhance reading skills and practical competence. *Journal of Vocational Education and Training, 74*(2), 210–225. https://doi.org/10.1080/13636820.2022.2103844

Tüzün, H., & Yıldırım, G. (2023). Effectiveness of project-based learning in vocational education: Enhancing reading and practical skills. *Educational Research and Reviews, 18*(1), 45–58. https://doi.org/10.5897/ERR2023.4295

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Widodo, A., & Soemanto, S. (2021). The use of project-based learning model to improve reading skills and practical skills in vocational culinary expertise program. *Journal of Vocational Education, 13*(2), 145–158. https://doi.org/10.21831/jpv.v13i2.45287