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Speaking Confidently: How Project-Based Learning Can Improve Student Communication

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ABSTRAK

Kesulitan dalam berbicara bahasa Inggris dengan lancar dan percaya diri menjadi salah satu keterampilan yang sulit dikuasai oleh para pelajar bahasa. Siswa dari budaya dengan gaya komunikasi atau harapan yang berbeda mungkin akan kesulitan untuk beradaptasi dengan konvensi percakapan dalam bahasa Inggris. Pembelajaran berbasis $proyek\ telah\ menjadi\ pendekatan\ pedagogis\ yang\ populer\ dalam\ beberapa\ tahun\ terakhir.$ Dengan memberikan siswa kesempatan untuk menerapkan pengetahuan mereka dalam praktik, pembelajaran berbasis proyek dapat meningkatkan motivasi, kreativitas, dan keterampilan berpikir kritis siswa. Penelitian ini bertujuan untuk menganalisis penerapan pembelajaran berbasis proyek dalam meningkatkan keterlibatan dan hasil belajar siswa dalam keterampilan berbicara. Penelitian ini menggunakan penelitian tindakan kelas, mengumpulkan data kualitatif dan kuantitatif melalui tes berbicara, serta data kualitatif melalui observasi, pre-test, dan post-test. Subjek dalam penelitian ini adalah tiga puluh satu siswa dari sebuah sekolah menengah atas swasta. Hasil penelitian menunjukkan bahwa terdapat pengaruh positif yang signifikan dari pembelajaran berbasis proyek terhadap kemampuan berbicara siswa, dengan rata-rata skor pasca-tes sebesar 84,70 dan selisih antara rata-rata skor siklus 1 dan siklus 2 sebesar 9,52, yang menunjukkan bahwa terdapat pengaruh signifikan dari pembelajaran berbasis proyek terhadap hasil belajar siswa, yang berarti bahwa terdapat korelasi positif antara penerapan pembelajaran berbasis proyek dan peningkatan kinerja berbicara siswa. Hasil penelitian ini sangat mendukung penggunaan pembelajaran berbasis proyek sebagai metode pengajaran yang efektif untuk meningkatkan kemampuan berbicara siswa.

ABSTRACT

Difficulty in speaking English fluently and confidently is one of the skills that language learners find difficult to master. Students from cultures with different communication styles or expectations may find it difficult to adapt to the conventions of conversation in English. Project-based learning has become a popular pedagogical approach in recent years. By providing students with opportunities to apply their knowledge in practice, project-based learning can improve students' motivation, creativity, and critical thinking skills. This study aims to analyze the application of project-based learning in improving students' engagement and learning outcomes in speaking skills. This study used classroom action research, collecting qualitative and quantitative data through speaking tests, as well as qualitative data through observation, pre-test, and post-test. The subjects in this study were thirty-one students from a private high school. The results showed that there was a significant positive effect of project-based learning on students' speaking ability, with an average post-test score of 84.70 and a difference between the average scores of cycle 1 and cycle 2 of 9.52, indicating that there was a significant effect of project-based learning on students' learning outcomes, meaning that there was a positive correlation between the application of project-based learning and the improvement of students' speaking performance. The results of this study strongly support the use of project-based learning as an effective teaching method to improve students' speaking skills.

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1. INTRODUCTION

Speaking skills are very important for learning English as a foreign language (EFL). These skills provide learners with important opportunities to actively use the language, express themselves, and communicate meaningfully with others. EFL learners who are proficient in speaking can communicate effectively in a variety of real-world situations, including interactions with other people, in the workplace, and in academic settings (Cohen et al., 2020; Dam et al., 2019). Speaking also helps build listening skills, as learners need to understand spoken language in order to respond effectively. Furthermore, oral communication helps strengthen these skills, as students use grammar, vocabulary, and pronunciation in their speech. Therefore, it is essential to prioritize

speaking activities in EFL courses to provide students with the communication skills needed to thrive in today's global society (Tai & Chen, 2020; Vartiainen et al., 2016).

Speaking at the higher education level aims to express emotions and ideas with the right words and with confidence. At the higher education level, speaking means expressing emotions, ideas and opinions in a coherent and logical way (Kumar & Nanda, 2019; Piotrowska et al., 2022). It also includes understanding conversations and asking questions. Speaking skills are important for all kinds of professions, from architects to teachers. For students, speaking is an important factor for success in English. Students also need to speak and communicate opinions, arguments, questions and answers in a coherent and logical way, and understand conversations (Al Mamun et al., 2022; Musliha & Revita, 2021). Speaking skills are important for everyone, regardless of their field of study. Architects, engineers, business people, scientists, teachers and others all need it to actively participate in the communication process and increase their knowledge. For students, speaking is an important skill to build and develop, as it is one of the factors that determine success in English. Previous study supports this statement, speaking is such a natural part of everyday life that we take it for granted, which implies that speaking is very important for everyone (Marzal, 2024). Effective communication is a fundamental skill that students need to develop throughout their academic and personal lives. Speaking is one of the most important ways of communicating and requires a combination of fluency, grammar, pronunciation and vocabulary (Rahman, 2019; Thaher, 2020).

Fluency refers to the ability to speak smoothly and naturally, without excessive pauses or hesitations. Fluency involves the ability to speak at a comfortable pace and with minimal effort. To improve speaking skills, students can practice speaking regularly, have conversations with native speakers or fellow students, and use shadowing techniques, namely, imitating the speech of role model speakers (Al Mamun et al., 2022; Cohen et al., 2020). In addition, reading and reciting texts aloud can help students develop a sense of rhythm and fluency in speaking. Grammar is the rules that determine the structure of language. Grammar includes aspects such as sentence formation, verb tenses, and word order (Cerezo et al., 2016; Dewi & Huda, 2020). Accurate grammar is essential for clear and effective communication. Students can improve their grammatical skills by learning grammar rules, practicing sentence structure, and using grammar correction tools.

Additionally, participating in a language exchange program or taking a grammar course can provide targeted instruction and feedback. Pronunciation, good pronunciation is very important for understanding and being understood. Students can improve their pronunciation by listening to native speakers, practicing sounds and intonation, and using pronunciation training apps or websites (Hudson & Nguyen, 2009; Kim et al., 2021). Improving students' speaking skills requires a holistic approach that addresses all four aspects: fluency, grammar, pronunciation, and vocabulary. By prioritizing speaking skills and using a variety of teaching methods and resources, teachers can enable foreign language learners to become proficient speakers so that they can communicate effectively and confidently in different situations. Teachers must prepare students to speak English not only in the classroom but also in real-life situations (Nursafira, 2020; Pratama, 2017). The reason for this is that a person's ability to speak affects a student's first impression. A person who speaks English fluently and comprehensively will make a better first impression than someone who lacks speaking skills. Therefore, it is very important for teachers to transform the classroom into an authentic learning environment (Made et al., 2022; Yilmaz, 2017).

However, many students struggle to speak English fluently and confidently. English remains one of the most difficult skills for language learners to master (Akdamar et al., 2021; Namaziandost et al., 2019). Students from cultures with different communication styles or different expectations may find it difficult Adapting to the conventions of English conversation suggests that although English is widely spoken, many students find it difficult to speak fluently and confidently about the culture and the gradual development of fluency (Obonyo, 2022; Yang, 2022). In the preliminary research for this study, it was observed that students in speaking classes were mostly taught teacher-centered methods. In addition, students showed a lack of enthusiasm and commitment to the learning process. This approach, where the teacher dominates the class and students only listen and respond, may lead to a lack of commitment, enthusiasm and ultimately effective learning of the students (Dudu & Vhurumuku, 2012; Namaziandost et al., 2019). Based on this, the researcher decided to conduct this study to identify and overcome existing problems in speaking so that students are expected to improve their English speaking skills through project-based learning (Koesoemadinata, 2022; Mohamadi, 2018).

Project-based learning has become a popular pedagogical approach in recent years. This approach provides an innovative way to actively engage students in the learning process. By giving students the opportunity to apply their knowledge in practice, project-based learning can increase students' motivation, creativity, and critical thinking skills (Hussin et al., 2019; Khan & Vuopala, 2019). Show that students' speaking skills improved significantly in various aspects, including grammar, vocabulary, pronunciation, fluency, and confidence. This increase was associated with a range of speaking activities implemented in this study, such as group discussions, interviews, voice recordings, and oral presentations (Basyoni et al., 2020; Yilmaz, 2017). By using this method, students can increase their knowledge and motivation in learning, have effective problem-solving skills, learn

independently, and be effective in collaboration skills (Diana et al., 2023; Mee Mee et al., 2020). In this method, students design projects and plan what to do. That is, students try to create a concept for their project and organize different steps about what they are going to do (Shebastian et al., 2020; Usher & Barak, 2020). Project-based learning is a learning model that provides students with the opportunity to actively participate in creating projects in groups or individual work to improve English language proficiency, especially speaking proficiency (Lampropoulos et al., 2019; Yilmaz, 2017). This study offers a new perspective on how Project-Based Learning (PBL), which is commonly applied to improve problem-solving and collaboration skills, can be directly focused on developing students' self-confidence and communication skills. This study aims to analyze the application of project-based learning in increasing students' engagement and learning outcomes in speaking proficiency.

2. METHOD

This study uses a Classroom Action Research design with the method. Classroom Action Research is a research conducted by teachers in their own classrooms through self-reflection, with the aim of improving their teaching performance so that students' learning outcomes increase (Kemmis et al., 2014). The essence of CAR lies in acting in reasonable situations to solve practical learning problems. CAR starts from practical problems that teachers/candidates face in the classroom. The subjects of this study were 31 students from one of the Private Senior high schools in Tabanan. Researchers used a purposive sampling technique to select participants based on certain characteristics or criteria, because they still had problems with speaking. Therefore, this study was conducted on a total of 31 students. The data in this study were collected at each stage of the classroom action research cycle, with the form of data depending on the stage or circumstances in which the research takes place.

There are two types of data collected in this study. The first and primary data are quantitative data in the form of scores collected through pre- and post-tests. The first is a pre-test (a test conducted before the treatment to determine the student's scores) and the second is a post-test (evaluation test after teaching through project-based learning to determine the student's progress). This test measures whether students improve their speaking skills after taking project-based teaching. The second instrument used in this study was observation and interviews to gain an in-depth understanding of students' responses to using project-based learning in speaking.

Data analysis methods are one of the important things for obtaining research results. Researchers collect data through testing and observation and then analyze it to get objective results. Qualitative data are obtained from observation data. Qualitative data were analyzed using descriptive analysis. Data were collected from the beginning to the end of the study, described in written form, including the results of observations of student activities, problems that occurred and curricula implemented in CAR. Quantitative data: to analyze the data, the mean, median, mode, standard deviation, and standard error of students' scores on the pre- and post-test scores were calculated. Researchers use this speaking test to assess students' speaking skills by describing something, paying attention to vocabulary, grammar, pronunciation, fluency, and comprehension (Suryani & Argawati, 2018).

3. RESULT AND DISCUSSION

Result

In collecting the data, the researchers applied three kinds of instruments, those were; pre-test and post-test. To find out, pre- and post-tests were conducted student results on speaking skills before and after implementation project-based learning as a teaching method. In this research the process begins planning, prepare curricula, materials and media that will be used in the teaching and learning process in the action phase. In addition, the researcher has made an observation sheet containing a list of students' names and a list of students' activities to observe students' activities during the teaching and learning process. Acting, Cycle 1 took place in 2 meetings, namely action meeting 1 and post-test meeting 1. The first meeting, began with prayer, greetings, checking attendance and asking about the status of the students.

The researchers acted as teacher and the staff as observers, and acted as follows: The researcher explains the material, ask students to form pairs, explain in the procedure of project-based learning, offering the instructions for making presentations, ask students to create presentation of the procedural text, and students draw conclusions about the lesson and the researcher provides information that a test will take place at the next meeting. The researcher closed the meeting. During the second meeting, after completing the procedural text project assignment, the students were evaluated by presenting the results of their work. In the observe researchers ensure this material about procedure text. In this project, researchers integrated speaking activities that reinforced the use of procedural texts.

That student participates in role-playing scenarios in which they act as experts and explain their procedural texts to others. They also participate in discussions about the effectiveness of their project presentations, reflection, at the end of cycle I, based on results the usage project-based learning can improve students' skills speaking skills. However, the number of students who passed the Minimum Results Criteria (KKM) was only

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11student. In addition, the students' activity also increased from the first meeting (pre-test) to the second meeting (post-test) in cycle 1.

Although it did not meet the success indicators, there was an increase in the students' ability score. to arrange words and learning activities from the first meeting to the next meeting in both cycles. It can be concluded that the first cycle was not successful because the success indicators were not met and researchers need to revise the teaching and learning process in the next cycle. Therefore, this research will be continued in the next cycle. Cycle II, based on the failed results of cycle I, it is necessary at this stage to re-run cycle II to correct the deficiencies in cycle I. The stages of cycle II are as follows. Planning, based on the activities from Cycle I, the process in Cycle II focused on the problems from Cycle I.

There were still several weaknesses in Cycle I, such as students who lacked focus while following lessons and students who had difficulty understanding the presented material. Researchers plan the material. Researchers prepare curricula and materials and provide students with opportunities to transfer the presented material. By using project-based learning, researchers try to improve students' speaking skills and I hope this will help students improve' interested in learning English. Action in Cycle II consists of two meetings, one meeting for action and one meeting for the post-test. The first meeting, This meeting was opened with prayer, greetings and a request for the students to do the same conditions and checking the attendance list.

During this meeting, the researcher provided real objects that were more interesting in the teaching and learning process. During the teaching and learning process. Second meeting used for post-test 2 at the end of cycle II for 2x40 minutes. Researchers gave students post-tests. Observe, this step the researcher transfers the material using projects for students. Four indicators are also used in the learning process to determine students' capabilities based on the results of the observation sheet in cycle II, the researcher showed that the learning process in cycle II went well. Reflection, the results of cycle II show that most students pay attention and can receive the material more clearly. The test results showed that students made good progress in this phase. They improve their understanding of the material, create procedural text significantly and improved speaking skills which is proven by successfully completing the post-test.

In each cycle of this study, pre- and post-tests were conducted the study. This study aims to determine the effectiveness of project-based learning in improving students' speaking skills. Research success is measured by the percentage of students who achieve a passing score of 60 or more. Pre-cycle. The results showed that the students' speaking skills were very low, with an average score of 63.38. However, after implementing Project-Based Learning in cycle 1, the average score increased significantly to 75.19. This increase shows that project-based learning is effective in improving students' speaking skills. In cycle 2, the average score increased again to 84.70, indicating continued improvement in speaking skills. The difference of 9.52 between the average scores of cycle 1 and cycle 2 shows the significant impact of project-based learning on student learning.

This study, the result is a strong advocate of using project-based learning as an effective teaching method to improve students' speaking skills. Data analysis consistently shows a positive correlation between the implementation of project-based learning and improved student speaking performance. The mean score of precycle, cycle 1 and cycle 2 is show in Table 1.

Table 1. The Mean Score of Pre-Cycle, Cycle 1 and Cycle 2

| | Pre- Cycle | Cycle 1 | Cycle 2 |
|------------|------------|---------|---------|
| Mean Score | 63.38 | 75.19 | 84.70 |

Discussion

Project-based learning is a strategy to improve students' speaking skills. By combining these approaches, teachers can create a dynamic and engaging learning environment that encourages language development and confidence. The importance of speaking in language education is emphasized by the fact that it is the most important skill for teachers to teach (Winatha & Abubakar, 2018; Yaacob & Lubis, 2022). In today's society, public speaking is highly valued as an important talent for academic, career, and personal success (Driver & Powell, 2017; Hidayati & Hidayah, 2020). One of the most important benefits of project-based learning is its ability to increase students' motivation.

The students are involved in projects that they find interesting and relevant, they tend to be more engaged and motivated to learn. This increased motivation can lead to better speaking performance, as students are more willing to practice and take risks. The project-based learning process moves toward the desired goal (Ibrahem & Alamro, 2020; Rand & Morrow, 2021). Students tend to practice more to produce the best work, as they seek the best results. But also the project creation process is carefully thought out. The procedures and end results help students to become more proficient speakers. In order for students to balance these two, adequate guidance and help from the teacher is essential (Slough & Milam, 2013; Vartiainen et al., 2016). In this study, project-based learning presentations are used to increase students' motivation in learning. Increasing students' motivation, interest, intensity and attitude during the learning process are indicators. The given text discusses a study that

aimed to investigate the effectiveness of project-based learning in improving students' speaking skills (Mustapha et al., 2020; Winatha et al., 2018). The researchers used pre- and post-tests to collect data on students' speaking skills before and after the implementation of Project Based Learning.

The research results showed that there was a significant increase in students' speaking ability after participating in Project Based Learning activities. Mean score on posttest 84.70 is significantly higher than the pre-test of 75.19, indicating that Project Based Learning is effective in improving students' language proficiency (Mutakinati et al., 2018; Ummah et al., 2019). The importance of speaking skills in language teaching and the benefits of project based learning in improving these skills. One of the most important benefits of Project Based Learning is its ability to increase students' motivation, which can lead to better speaking performance (Fatimah & Santiana, 2017; Udayani et al., 2022).

This discussion also highlights the importance of teacher guidance and support in ensuring the success of project based learning projects. This study provides evidence that Project Based Learning can be a valuable tool for improving students' speaking skills. By combining Project Based Learning with other effective teaching strategies, teachers can create a dynamic and engaging learning environment that promotes language development and confidence.

4. CONCLUSION

The results from research indicates that learning is project-based is a valuable tool for improving language skills and promoting a more engaging and effective learning environment. Letter students who participate project-based learning activities showed a significant improvement in their speaking skills as evidenced by a higher mean score on the post-test compared to the pre-test Project-based learning. Assignments require students to think critically and solve problems, allowing them to develop valuable cognitive skills. Working on projects gives students the opportunity to practice their communication and collaboration skills. It can be concluded that Project-based Learning is a promising approach to improving students' speaking skills and creating a more interesting and effective language learning environment. For more researchers long-term effects of Project-based learning about speaking skills can be done to track student progress over time. By continuing to do research and Project-based learning teachers can provide students with the opportunities and support they need to develop speaking skills and become successful language learners.

5. REFERENCES

- Akdamar, N., S., Sutcu, S., & S. (2021). Effects of digital stories on the development of EFL learners' listening skill. *The Asian Institute of Research Education Quarterly Reviews*, 4(4), 271–279. https://doi.org/10.31014/aior.1993.04.04.391.
- Al Mamun, M. A., Lawrie, G., & Wright, T. (2022). Exploration of learner-content interactions and learning approaches: The role of guided inquiry in the self-directed online environments. *Computers & Education*, 178, 104398. https://doi.org/10.1016/j.compedu.2021.104398.
- Basyoni, A., Bee, M., S., H., Seng, G., & H. (2020). The effectiveness of using students' created digital storytelling in enhancing Saudi ninth graders' critical listening skills. *Journal of Education and Social Sciences*, 16(1), 58–72. https://doi.org/https://www.jesoc.com/wp-content/uploads/2020/12/JESOC16-030.pdf.
- Cerezo, L., Caras, A., & Leow, R. P. (2016). The Effectiveness Of Guided Induction Versus Deductive Instruction On The Development Of Complex Spanish Gustar Structures. *Studies in Second Language Acquisition*, 38(2), 265–291. https://doi.org/10.1017/S0272263116000139.
- Cohen, J., Wong, V., Krishnamachari, A., & Berlin, R. (2020). Teacher coaching in a simulated environment. *Educational Evaluation and Policy Analysis*, 42(2), 208–231. https://doi.org/10.3102/016237372.
- Dam, M., Ottenhof, K., Van Boxtel, C., & Janssen, F. (2019). Understanding cellular respiration through simulation using lego as a concrete dynamic model. *Education Sciences*, 9(2), 72. https://doi.org/10.3390/educsci9020072.
- Dewi, F. S., & Huda, M. C. (2020). An Analysis of Students 'Errors in Writing Descriptive Text at Tenth Grade of SMAN 1 Tulungagung in Academic Year 2018 / 2019. A Journal of English Language Teaching, Linguistics, and Literature, 3(1), 11–20. https://www.academia.edu/download/87227928/1544-3105.
- Diana, Surjono, H. D., & Mahmudi, A. (2023). The Effect of Flipped Classroom Learning Model on Students' Understanding of Mathematical Concepts and Higher-Order Thinking Skills. *International Journal of Information and Education Technology*, *13*(12), 2014–2022. https://doi.org/10.18178/ijiet.2023.13.
- Driver, M. K., & Powell, S. R. (2017). Culturally and linguistically responsive schema intervention: improving word problem solving for english language learners with mathematics difficulty. *Learning Disability Quarterly*, 40(1), 41–53. https://doi.org/10.1177/0731948716646730.
- Dudu, W. T., & Vhurumuku, E. (2012). Teacher practices of inquiry when teaching investigations: A case study.

- Journal of Science Teacher Education, 23(6), 579-600. https://doi.org/10.1007/s10972-012-9287-y.
- Fatimah, A. S., & Santiana, S. (2017). Teaching in 21St Century: Students-Teachers' Perceptions of Technology Use in the Classroom. Script Journal: Journal of Linguistic and English Teaching, 2(2), 125. https://doi.org/10.24903/sj.v2i2.132.
- Hidayati, R., & Hidayah, N. (2020). The Differences of Students' Self-Confidence Level in Full Day Class and Regular Class of Elementary School. *JPI (Jurnal Pendidikan Indonesia)*, 9(4), 649. https://doi.org/10.23887/jpi-undiksha.v9i4.22356.
- Hudson, P., & Nguyen, T. M. H. (2009). What Do EFL Preservice Teachers Expect from Their Mentors? In P. Jeffery (Ed.), Changing Climates: Education for Sustainable Futures: Proceedings of the Australian Association for Research in Education (AARE) International Education Research Conference 2008 (pp. 1–10). Australian Association for Research in Education. https://metprogram.com/wp-content/uploads/2016/01/Mentees-expectations.
- Hussin, H., Jiea, P. Y., Rosly, R. N. R., & Omar, S. R. (2019). Integrated 21st century science, technology, engineering, mathematics (STEM) education through robotics project-based learning. *Humanities and Social Sciences Reviews*, 7(2), 204–211. https://doi.org/10.18510/hssr.2019.7222.
- Ibrahem, U. M., & Alamro, A. R. (2020). Effects of Infographics on Developing Computer Knowledge, Skills and Achievement Motivation among Hail University Students. *International Journal of Instruction*, *14*(1), 907–926. https://doi.org/10.29333/IJI.2021.14154A.
- Kemmis, S., McTaggart, R., & Nixon, R. (2014). *The action research planner: Doing critical participatory action research*. Springer.
- Khan, F., & Vuopala, E. (2019). Digital competence assessment across generations: A Finnish sample using the digcomp framework. *International Journal of Digital Literacy and Digital Competence (IJDLDC)*, 10(2), 15–28. https://www.igi-global.com/article/digital-competence-assessment-across-generations/236671.
- Kim, H. S., Cha, Y., & Kim, N. Y. (2021). Effects of AI chatbots on EFL students' communication skills. *Korean Journal of English and Linguistics*, 21, 712–734. https://doi.org/: 10.15738/kjell.21..202108.712.
- Koesoemadinata, M. I. P. (2022). Visual Adaptation Of Wayang Characters In Teguh Santosa's Comic Art. *Mudra Jurnal Seni Budaya*, 33(3), 401. https://doi.org/10.31091/mudra.v33i3.544.
- Kumar, V., & Nanda, P. (2019). Social media in higher education: A framework for continuous engagement. *International Journal of Information and Communication Technology Education (IJICTE)*, 1, 5(1), 97–108. https://doi.org/10.4018/IJICTE.2019010107.
- Lampropoulos, G., Siakas, K., & Anastasiadis, T. (2019). Internet of Things in the Context of Industry 4.0: An Overview. *International Journal of Entrepreneurial Knowledge*, 7(1), 4–19. https://doi.org/10.2478/ijek-2019-0001.
- Made, I., Dharma, A., Ayu, N., & Lestari, P. (2022). The Impact of Problem-based Learning Models on Social Studies Learning Outcomes and Critical Thinking Skills for Fifth Grade Elementary School Students. *Jurnal Ilmiah Sekolah Dasar*, 6(2), 263–269. https://doi.org/10.23887/JISD.V6I2.46140.
- Marzal, J. (2024). Desain Media Pembelajaran Bahasa Inggris Untuk Siswa Tunarungu Berbantuan Teknologi Informasi Dan Komunikasi. *Tekno Pedagogi: Jurnal Teknologi Pendidikan*, 4(2), 32–44. https://doi.org/10.22437/teknopedagogi.v4i2.2291.
- Mee Mee, R. W., Shahdan, T. S. T., Ismail, M. R., Abd Ghani, K., Pek, L. S., Von, W. Y., Woo, A., & Rao, Y. S. (2020). Role of gamification in classroom teaching: Pre-service teachers' view. *International Journal of Evaluation and Research in Education*, *9*(3), 684–690. https://doi.org/10.11591/ijere.v9i3.20622.
- Mohamadi, Z. (2018). Comparative effect of project-based learning and electronic project-based learning on the development and sustained development of english idiom knowledge. *Journal of Computing in Higher Education*, 30(2), 363–385. https://doi.org/10.1007/s12528-018-9169-1.
- Musliha, & Revita, R. (2021). Pengaruh Model Pembelajaran Problem Based Learning Terhadap Kemampuan Pemecahan Masalah Matematis Ditinjau dari Self Regulated Learning Siswa. *JRPM (Jurnal Review Pembelajaran Matematika*), 6(1), 68–82. https://doi.org/10.15642/jrpm.2021.6.1.68-82.
- Mustapha, R., Sadrina, Nashir, I. M., Azman, M. N. A., & Hasnan, K. A. (2020). Assessing the implementation of the project-based learning (PJBL) in the department of mechanical engineering at a Malaysian polytechnic. *Journal of Technical Education and Training*, 12(1 Special Issue), 100–118. https://doi.org/10.30880/jtet.2020.12.01.011.
- Mutakinati, L., Anwari, I., & Yoshisuke, K. (2018). Analysis of students' critical thinking skill of middle school through stem education project-based learning. *Jurnal Pendidikan IPA Indonesia*, 7(1), 54–65. https://doi.org/10.15294/jpii.v7i1.10495.
- Namaziandost, E., Neisi, L., Mahdavirad, F., & Nasri, M. (2019). The relationship between listening comprehension problems and strategy usage among advanced EFL learners. *Cogent Psychology*, *6*(1), 1–19. https://doi.org/10.1080/23311908.2019.1691338.
- Nursafira, M. S. (2020). TED Talks in EFL Context: An Alternative Way for Teaching and Improving Student's

- Speaking Skills. *Elsya: Journal of English Language Studies*, 2(2), 43–47. https://doi.org/10.31849/elsya.v2i2.3968.
- Obonyo, C. N. (2022). Collaborative learning with mobile technologies in teacher education. In *Handbook of Research on Facilitating Collaborative Learning Through Digital Content and Learning Technologies* (pp. 62–83). IGI Global. https://doi.org/10.4018/978-1-6684-5709-2.ch004.
- Piotrowska, I., Cichoń, M., Sypniewski, J., & Abramowicz, D. (2022). Application of Inquiry-Based Science Education, Anticipatory Learning Strategy, and Project-Based Learning Strategies. *In Didactic Strategies and Resources for Innovative Geography Teaching*, 23–50. https://doi.org/10.4018/978-1-7998-9598.
- Pratama, P. G. A. (2017). a Case Study: Parents' Perceptions on Children Bilingual Education in Bali. *Prasi*, 12(01). https://doi.org/10.23887/prasi.v12i01.13913.
- Rahman, M. M. (2019). 21st Century Skill "Problem Solving": Defining the Concept. *Asian Journal of Interdisciplinary Research*, 2(1), 64–74. https://doi.org/10.34256/ajir1917.
- Rand, M. K., & Morrow, L. M. (2021). The Contribution of Play Experiences in Early Literacy: Expanding the Science of Reading. *Reading Research Quarterly*, 56(S1), 239–248. https://doi.org/10.1002/rrq.383.
- Shebastian, I. G. R. ., Suyasa, I. M. S., & Arta, P. . (2020). Pengembangan Media Pembelajaran Interaktif "Pengenalan Hewan Dan Tumbuhan" Pada Mata Metode Gamefikasi Untuk Siswa Kelas Ii Di Sekolah Dasar. *Karmapati*, 9(1), 8–20. https://doi.org/10.23887/karmapati.v9i1.23270.
- Slough, S. W., & Milam, J. O. (2013). Theoretical framework for the design of STEM project-based learning. STEM Project-Based Learning an Integrated Science, Technology, Engineering, and Mathematics (STEM) Approach, 15–27. https://doi.org/10.1007/978-94-6209-143-6_3.
- Suryani, L., & Argawati, N. O. (2018). Risk-Taking and Students' Speaking Ability: Do They Correlate? *ELTIN JOURNAL*, *Journal of English Language Teaching in Indonesia*, 6(1), 34. https://doi.org/10.22460/eltin.v6i1.p34-45.
- Tai, T. Y., & Chen, H. H. J. (2020). The impact of Google Assistant on adolescent EFL learners' willingness to communicate. *Interactive Learning Environments*, 1–18. https://doi.org/10.1080/10494820.2020.
- Thaher, K. (2020). Professional Requirements for Secondary School Principals in The Light Of 21st Century Competencies. *International Journal of Research in Education Methodology*, 11, 55–63. https://doi.org/10.24297/IJREM.V11I.8692.
- Udayani, N. K. R. T. K., Wibawa, I. M. C., & Rati, N. W. (2022). Development Of E-Comic Learning Media On The Topic Of The Human Digestive System. *Journal of Education Technology*, *5*(3), 472–481. https://doi.org/10.23887/jet.v5i3.34732.
- Ummah, S. K., Inam, A., & Azmi, R. D. (2019). Creating manipulatives: Improving students' creativity through project-based learning. *Journal on Mathematics Education*, 10(1), 93–102. https://doi.org/10.22342/jme.10.1.5093.93-102.
- Usher, M., & Barak, M. (2020). Team diversity as a predictor of innovation in team projects of face-to-face and online learners. *Computers and Education*, *144*(September 2019), 103702. https://doi.org/10.1016/j.compedu.2019.103702.
- Vartiainen, H., Pöllänen, S., & Liljeström, A. (2016). Designing Connected Learning: Emerging learning systems in a craft teacher education course. *Design And*, 21(2), 32–40. https://ojs.lboro.ac.uk/DATE/article/download.
- Winatha, K. R., & Abubakar, M. M. (2018). The Usage Effectivity of Project-Based Interactive E-Module in Improving Students' Achievement. *Jurnal Pendidikan Teknologi Dan Kejuruan*, 24(2), 198–202. https://doi.org/10.21831/jptk.v24i2.20001.
- Winatha, K. R., Naswan, S., & Ketut, A. (2018). Pengembangan E-modul Interaktif Berbasis Proyek Pada Mata Pelajaran Simulasi Digital Kelas X di SMK TI Bali Global Singaraja. *Jurnal Teknologi Pembelajaran Indonesia*, 8(1). https://doi.org/10.23887/jtpi.v8i1.2238.
- Yaacob, A., & Lubis, A. H. (2022). The Development of Web-Based Teaching Materials Integrated with Indonesian Folklore for Indonesian Language for Foreign Speakers Students. *International Journal of Language Education*, 6(1), 46–62. https://eric.ed.gov/?id=EJ1343101.
- Yang, J. (2022). Perceptions of preservice teachers on AI chatbots in English education. *International Journal of Internet, Broadcasting and Communication*, 14(1), 44–52. https://doi.org/10.7236/IJIBC.2022.14.1.44.
- Yilmaz, R. (2017). Exploring the role of e-learning readiness on student satisfaction and motivation in flipped classroom. *Computers in Human Behavior*, 70, 251-260. https://doi.org/10.1016/j.chb.2016.12.085.