Implementation of Vygotsky's Constructivism through Project Based Learning to Improve Problem Solving of Grade XI Students at SMA Negeri 1 Kauditan

Hermin Ranting[1*)], Jelty Juriaty Rumetor[2)], Yahya Herman Liud[3)], Ristan Rakim[4)], Hizkia Joel Kambong[5)], Julio Eleazer Nendissa[6)], Frimsi Wohon[7)]

[1),2),3),4),5),6),7)] Sekolah Tinggi Teologi Transformasi Indonesia Manado

Correspondence Authors: herminranting42@gmail.com
Article history: received October 28, 2024; revised November 05, 2024; accepted January 15, 2025

Abstract

The era of education, which increasingly demands an increase in the quality of human resources (HR), has positioned teachers as an important component of the learning process. Project-based learning (PjBL) is learning model that aims to provide students with real project-based learning experiences. This model is based on the principles of Vygotsky's constructivism, which emphasizes the importance of social interaction and collaboration in learning. In the context of PAK learning, project-based learning helps students develop critical, analytical, and creative thinking skills as well as problem-solving abilities. This study uses a descriptive qualitative approach to analyze the impact of implementing the project-based learning model on improving the problem-solving abilities of Grade XI students at SMA Negeri I Kauditan. Data collected through observations, interviews, and questionnaires involving students and Christian Religious Education (PAK) teachers show that project-based learning has proven effective in developing students' critical and analytical thinking skills. Students feel confident in facing challenges, collaborative in working in groups, and more disciplined in completing tasks. Teacher evaluations also confirm that the process of working on a project is as important as the end result because it can describe the development of students' problem-solving skills as a whole.

Keywords: Vygotsky's Constructivism, Project Based Learning and Problem Solving.

I. INTRODUCTION

Christian religious education (CHE) teachers have an integral responsibility to support learners' skill development, especially within the framework of constructivism.[1] PAK teachers need to participate in facilitating a learning atmosphere that supports the exploration of ideas and the application of construction skills to the fullest extent. This role is crucial as constructivist learning not only involves theoretical knowledge, but also encourages students to apply what they learn in a real context. Therefore, the application of relevant learning models is needed to support constructivist theory in improving students' abilities, one of which is project-based learning (PJBL). Project based learning (PjBL) is a learning model based on constructivism that provides space for the active involvement of students in the learning process. In addition, project-based learning also plays a role in encouraging contextual problem-solving efforts, in which students are invited to face real challenges and develop critical, creative, and collaborative thinking skills. This model is very effective in equipping students with the skills needed to face real-world problems.[2]

Project-based learning focuses on active learning, in which learners explore authentic questions or tasks, develop plans, reflect on evaluating solutions, and produce multiple representations of ideas. project is a comprehensive instructional approach that can motivate children to think about what they do, not just focus on getting it; theoretically, a project-based learning model or project-based learning is a strategy in learning to empower learners to gain both knowledge or skills and understanding of new material obtained based on the experience of presentation or completing a project given by the teacher.[3] Project-based learning

---

[1] J. E. Nendissa, "Peran Orang Tua Kristen Dalam Mencegah Anak Yang Kecanduan Game Online Dikaji Dari Perspektif Fondasi Pendidikan Kristen," *Jurnal Teologi Praktika* 5, no. 1 (2024): 18–30.

[2] Tiok Setiawan et al., "Analisis Penerapan Model Pembelajaran Project Based Learning Dan Problem Based Learning Pada Peserta Didik Sekolah Dasar," *Jurnal Basicedu* 6, no. 6 (October 17, 2022): 9736–9744, https://jbasic.org/index.php/basicedu/article/view/4161.

[3] Frimsi Wohon, Ferry Johnny Nicolaas Sumual, and Ristan Rakim, "Model Pembelajaran Blended Learning: Implementasi Pada Peningkatan Kompetensi Pedagogik Dan Kompetensi Profesional Dosen," *TELEIOS: Jurnal Teologi dan Pendidikan Agama Kristen* 4, no. 1 (June 29, 2024): 113–125.

(PBL) is a technique that provides innovation in the art of teaching. The role of the teacher in this method is as a facilitator who provides facilities for students when asking questions about theory and motivates students to be active in learning, which provides opportunities for educators to fully control the learning process that takes place.[4]

The application of project-based learning in Christian religious education can help students understand religious teachings more contextually, so that they not only understand the theory but can also apply it in their daily lives. The implementation of this learning model still faces various challenges, especially in the context of teaching in SMA Negeri I Kauditan. Christian Religious Education teachers in this school need to understand how to integrate Vygotsky's constructivism theory with the project-based learning model to improve students' problem solving skills. In the context of religious learning, this ability is very important because students are often faced with real life situations that require a deep understanding of Christian values to make the correct decisions.

This research shows that the implementation of a project-based learning model is proven to be effective in improving students' problem-solving ability as well as hiving a positive impact on students' critical, analytical, and creative thinking skills. Through real-life projects relevant to daily life, students are actively involved in a deep learning process, where they can identify problems, design solutions, and work collaboratively. The results also highlight the importance of the teacher's role as a facilitator and companion in the learning process, to help students overcome challenges. The main suggestions from this study include increasing the relevance of the project to real life, optimizing teamwork, and implementing more structured scaffolding to support students in the project-based learning process. This is expected to contribute to improving the quality of learning, especially in Christian Religious Education subjects, and to help students be better prepared to face future challenges.

Previous research by Michaela and Sjafiatul aimed to describe the implications of Vygotsky's constructivism theory in the application of group learning models with safety corners at Anak Mandiri Kindergarten Surabaya.[5] In addition, Beti et al. explained that there were three main focuses of this study: namely describing the implementation pattern, supporting factors, and inhibiting factors in the implementation of constructivism theory in limited face-to-face learning in elementary schools.[6] Leorince et al. conducted research on how a teacher becomes a companion in learning through at problem-solving approach.[7] Suci and Heru researched related to identifying the application of project-based learning in Vygotsky's constructivist paradigm in the Merdeka Belajar Curriculum in elementary schools.[8] The four studies above only examined the implications of Vygotsky's constructivism theory, supporting and inhibiting factors, and constructivism with the curriculum for independent learning in elementary schools. Meanwhile, this research aims to increase teachers' understanding of Vygotsky's constructivism theory, determine the project-based learning model by Christian Religious Education teachers on the problem-solving ability of grade XI students of SMA Negeri I Kauditan, and determine the impact of the application of the project-based learning model by Christian Religious Education teachers on the problem-solving ability of grade XI students of SMA Negeri I Kauditan. This the novelty of the four aforementioned studies.

II. METHODS

This study uses qualitative research by adopting a descriptive approach. This study obtained data from a literature approach by applying a qualitative paradigm and a qualitative descriptive approach that does not involve quantitative data analysis.[9] Due to the complexity, scope, dynamics, and importance of the research issue, descriptive qualitative research aims to thoroughly and comprehensively describe the actual reality and is based of observations on existing phenomena.[10] Data were collected through interviews with ten people.[11] This activity includes processing and organizing data from observations, interviews, and

[4] Putri Dewi Anggraini and Siti Sri Wulandari, "Analisis Penggunaan Model Pembelajaran Project Based Learning Dalam Peningkatan Keaktifan Siswa," *Jurnal Pendidikan Administrasi Perkantoran (JPAP)* 9, no. 2 (August 16, 2020): 292–299, https://journal.unesa.ac.id/index.php/jpap/article/view/9902.

[5] Michaela Zebada Faustina Agrippine Amahorseya and Sjafiatul Mardliyah, "IMPLIKASI TEORI KONSTRUKTIVISME VYGOTSKY DALAM PENERAPAN MODEL PEMBELAJARAN KELOMPOK DENGAN SUDUT PENGAMAN DI TK ANAK MANDIRI SURABAYA," *Jurnal Buah Hati* 10, no. 1 (March 30, 2023): 16–28, https://ejournal.bbg.ac.id/buahhati/article/view/2024.

[6] Beti Istanti Suwandayani, Kuncahyono, and Ade Ika Anggraini, "POLA IMPLEMENTASI TEORI KONSTRUKTIVISME PADA PEMBELAJARAN TATAP MUKA TERBATAS DI SEKOLAH DASAR," *Taman Cendekia: Jurnal Pendidikan Ke-SD-an* 5, no. 2 (December 29, 2021): 609–618, https://jurnal.ustjogja.ac.id/index.php/tamancendekia/article/view/11472.

[7] Leorince Leorince et al., "Kualitas Guru Pendidikan Agama Kristen Dalam Mendidik Generasi Z Di Era Digital," *EDUKATIF : JURNAL ILMU PENDIDIKAN* 4, no. 5 (September 7, 2022): 6775–6787, https://www.edukatif.org/index.php/edukatif/article/view/3864.

[8] Suci Setiyaningsih and Heru Subrata, "Penerapan Problem Based Learning Terpadu Paradigma Konstruktivisme Vygotsky Pada Kurikulum Merdeka Belajar," *Jurnal Ilmiah Mandala Education* 9, no. 2 (April 22, 2023), https://ejournal.mandalanursa.org/index.php/JIME/article/view/5051.

[9] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, Dan R&D* (Bandung: Alfabeta, 2021), 2.

[10] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, Dan Kombinasi (Mixed Methods)* (Bandung: Alfabeta, 2016), 225.

[11] John Creswell, *Research Design: Pendekatan Kualitatif Dan Mixed* (Yogyakarta: Pustaka Belajar, 2017), 5.

documentation at SMA Negeri I Guru Lombok Kalawat. Data were interpreted according to the context of the problem under study. To ensure the validity of the data, the sources and methods used are checked, so that the data obtained are credible to provide meaning in the research.[12]

III. RESULTS AND DISCUSSION

Analysis of Understanding Vygotsky's Constructivism Theory in the Project Based Learning (PjBL) Model

1. *Teachers' Understanding of Vygotsky's Constructivism Theory*

Teachers' understanding of Vygotsky's theory of constructivism is not only a theoretical aspect of the learning process, but also an important basis for creating significant learning experiences for students. This theory highlights that the learning process takes place through social interaction and active participation of students in the learning process according to the opinion of one teacher, who revealed that Vygotsky's constructivism theory emphasizes that learning is a social process influenced by interactions with others and provides an understanding that students' potential can develop when they are active in building abilities and learning processes at school and still need guidance or mentoring from teachers.[13] Another teacher explained that constructivism theory that emphasizes learning and social processes that are strongly influenced by interactions with others.[14]

According to the vice principal of SMA Negeri I Kauditan, Vygotsky's theory of constructivism is useful because it means construction, which means we build from the ground up. Thus, children have the capacity to learn proactively, because they start from the base. Therefore, they can be motivated to prepare for a bright future.[15] Undoubtedly, the theory of constructivism is highly relevant to contemporary circumstances and needs. This theory prioritizes learner-centered learning, in which knowledge is self-created through social interaction, whether under the guidance of the teacher or with peers.[16] In agreement with other teachers, constructivism theory emphasizes social and cultural interactions. It also state that teacher guidance and interaction with peers or the environment are the best ways for students to learn. It is crucial for teachers to understand Vygotsky's theory of constructivism in order to make students' learning experiences meaningful. This theory emphasizes that learning is a social process that occurs through the interaction and active participation of students.[17] It also emphasizes how important it is for teachers to assist students in their learning processes. The majority of teachers have a good understanding of this theory, and interviews with the school confirmed that constructivism encourages students to learn proactively, build knowledge from the ground, and prepare for a better future.

2. *Vygotsky's Theory of Constructivism Relevant in Teaching at SMA Negeri I Kauditan.*

Vygotsky's theory of constructivism provides a strong foundation for an effective learning process in SMA Negeri I Kauditan. This theory emphasizes that learning is not just a transfer of knowledge from teachers to students but rather a dynamic process that occurs through social interaction and collaboration. Key concepts such as the zone of proximal development and scaffolding are relevant in teaching at this high school, and this can be proven from the open-ended questionnaire. Based on the interviews, the theoretical concepts of the zone of proximal development and scaffolding as important elements of Vygotsky's theory of constructivism are relevant to teaching. The two main concepts from Vygotsky's theory of constructivism, which are most relevant in teaching, are zones of proximal development and scaffolding. The zone of proximal development describes the distance between the ability that students have independently and the potential that can be achieved with the help of others such as teachers or peers. Scaffolding serves as a support provided during the learning process to help students overcome the challenges faced.[18] This concept is essential in creating effective learning experiences that are responsive to students' needs so that they can develop optimally in the learning environment.[19] In addition, one of the teachers said that interaction with peers, teachers, and

[12] Nursanjaya, "MEMAHAMI PROSEDUR PENELITIAN KUALITATIF: Panduan Praktis Untuk Memudahkan Mahasiswa," *NEGOTIUM: Jurnal Ilmu Administrasi Bisnis* 4, no. 1 (2021): 126–141.

[13] Hasil Wawancara Dengan SP, Wakil Kepala Sekolah SMA Negeri I Kauditan, Kauditan, 22 September 2024 pada pukul 11:00-11:15 WITA).

[14] Hasil Wawancara Dengan NW, Guru PAK SMA Negeri I Kauditan, Kauditan, 22 September 2024 pada pukul 11:30-11:45 WITA).

[15] Hasil Wawancara Dengan SP, Wakil Kepala Sekolah SMA Negeri I Kauditan.

[16] Hasil Wawancara Dengan MM, Salah Satu Guru SMA Negeri I Kauditan, Kauditan, 22 September 2024 pada pukul 12:00-12:10 WITA).

[17] Julio Eleazer Nendissa, "Pentingnya Partisipasi Pemuda Dalam Pembangunan Jemaat: Studi Kasus Pada Gereja Masehi Injili Minahasa Syaloom, Karombasan," *KHARISMATA: Jurnal Teologi Pantekosta* 5, no. 1 (July 24, 2022): 66–80, https://e-journal.stajember.ac.id/index.php/kharismata/article/view/108.

[18] Julio Nendissa, "Peran Kitab Keagamaan Terhadap Perkembangan Iman Pemuda Gereja Dalam Pendidikan Kristen," *DIDASKALIA: Jurnal Pendidikan Agama Kristen* 2, no. 2 (2021): 44–55.

[19] Hasil Wawancara Dengan DO, Salah Satu Guru SMA Negeri I Kauditan, Kauditan, 22 September 2024 pada pukul 12:30-12:40 WITA).

other adults is very important in learning because, through discussion, students can help each other and enrich their understanding.[20] One student responded that cooperation with classmates during projects or assignments is very helpful in solving problems, because the different perspectives of each member often open up new ways to overcome the challenges faced.[21] Cooperation with friends is very enjoyable because they can help them find references.[22]

Vygotsky's theory of constructivism provides a solid foundation for creating an effective learning process at SMA Negeri I Kauditan based on the discussion above. By emphasizing the importance of social interaction and collaboration, this theory not only shows that learning is a transfer of knowledge but also a dynamic process that involves the active participation of students.

3. *Vygotsky's Theory of Constructivism Effectively Supports Student Development Through Project Based Learning.*

Vygotsky's theory of constructivism offers a learner-centered approach, in which learning is seen as a dynamic social process; students are not just passive recipients of knowledge, but actively construct their understanding through interactions with teachers and peers. The application of this theory in modern education, particularly in schools such as SMA Negeri I Kauditan, helps create a learning environment that supports students' cognitive, social, and emotional development. In the open-ended questionnaire, apart from the zone of proximal development and scaffolding, there are several other approaches from Vygotsky's constructivism theory that are relevant in supporting students' development. One of them is contextual learning according to the teacher's expression, which link the subject matter with real situations and helps students more easily understand and apply the knowledge they learn.[23] Another opinion from the teacher was that the use of language as a tool of thought through dialog and discussion is also an important element that encourages students to think critically and verbally.[24] Vygotsky's theory of constructivism is very helpful for the development of students in SMA Negeri I Kauditan which emphasizes active social interaction in learning that can improve students' cognitive, social, and emotional aspects. In the open-ended questionnaire, apart from the zone of proximal development and scaffolding, the contextual learning approach was also considered important because it can connect lessons with real situations so that students can easily understand and use knowledge. In addition, the use of language to think through conversation and discussion is considered very important, inviting students to think carefully and improve their speech.[25] Thus, the use of Vygotsky's theory of constructivism is helpful in the development of students in modern education.

Analysis of the Relevance of the Implementation of Vygotsky's Theory of Constructivism through the Project Based Learning Model on Students' Problem Solving Ability.

1. *Application of Project Based Learning Model in learning.*

Project-based learning is learning method that emphasizes student involvement in real projects relevant to the subject matter. The application of the project-based learning model in learning focuses on developing critical thinking skills, problem solving, and collaboration between students. In the process, students are encouraged to explore, plan, and complete projects independently or in groups under the guidance of the teacher, which is in accordance with the statement from the head of SMA Negeri I Kauditan to design projects that require collaboration between students so that they can help each other and can discuss, then provide guidance, then tools, and guide questions to help students complete the project. Collaboration and guidance were the main components that helped students complete the project.[26]

Collaboration and guidance are the main components that help students complete projects. Based on the open-ended questionnaire, the teacher respondents explained that in implementing project-based learning, the first thing to consider is determining the topic or project to be carried out, then guiding students during the work and evaluating the project that has been done.[27] A different opinion from the vice principal for infrastructure argues that the project-based learning model is applied in learning by designing relevant and contextual projects, which allow students to learn through exploration, research, and real problem solving; for example, choosing topics or problems that are relevant to the subject matter and interesting to students. In

---

[20] Hasil Wawancara Dengan E, Salah Satu Guru SMA Negeri I Kauditan, Kauditan, 22 September 2024 pada pukul 13:00-13:08 WITA).

[21] Hasil Wawancara Dengan O, Salah Satu Siswa SMA Negeri I Kauditan, Kauditan, 23 September 2024 pada pukul 09:15-09:27 WITA).

[22] Hasil Wawancara Dengan AMCL, Salah Satu Siswa SMA Negeri I Kauditan, Kauditan, 23 September 2024 pada pukul 09:30-09:40 WITA).

[23] Hasil Wawancara Dengan PM, Salah Satu Guru SMA Negeri I Kauditan, Kauditan, 23 September 2024 pada pukul 10:00-10:10 WITA).

[24] Hasil Wawancara Dengan AAB, Salah Satu Guru SMA Negeri I Kauditan, Kauditan, 23 September 2024 pada pukul 10:15-10:29 WITA).

[25] Jelty Juriaty Rumetor & Rosdinar Pangaribuan, "PERAN REMAJA DALAM PERTUMBUHAN GEREJA LOKAL," *Proskuneo Journal of Theology* 1, no. 1 (2024): 46–57.

[26] Hasil Wawancara Dengan JW, Kepala Sekolah SMA Negeri I Kauditan, Kauditan, 23 September 2024 pada pukul 13:00-13:30 WITA).

[27] Hasil Wawancara Dengan JW, Kepala Sekolah SMA Negeri I Kauditan.

OPEN ACCESS

addition to designing relevant and contextual projects that allow students to learn through exploration, research, and real problem-solving.[28] Some teachers also use health, healthy lifestyles, and mini-museum projects to facilitate interactive and collaborative learning. Teachers provide guidance during the project process and direct students to work in groups, preparing them to practically apply the knowledge they have gained because there are things to consider when implementing project-based learning models in learning, such as the occurrence of misconceptions or misunderstandings.[29] Project-based learning has proven to be an effective learning method for encouraging students to actively engage in real projects that are relevant to the subject matter. With a focus on developing critical thinking, problem-solving, and collaboration skills, project-based learning allows students to learn through exploration and research, both independently and in groups. The principal of SMA Negeri I Kauditan emphasized the importance of collaboration and guidance in the successful implementation of project-based learning, where students are encouraged to discuss and work together in completing projects.

2. *Integration of Vygotsky's Theory of Constructivism in Project Based Learning at SMA Negeri I Kauditan.*

Project-based learning is an increasingly relevant learning method in the 21st century, where critical thinking, problem-solving, and collaboration skills are key to students' success in facing global challenges. Project-based learning involves students in real projects that are relevant to the subject matter, providing them with contextualized and meaningful learning experiences. Vygotsky's theory of constructivism, which emphasizes the importance of social interaction and the zone of proximal development is an important foundation for this approach. By integrating Vygotsky's theory, project-based learning allows students to achieve deeper understanding through support from teachers and peers. In SMA Negeri I Kauditan, the application of project-based learning, adapted to the needs of the 21st century, prepares students to face an ever-evolving world with relevant and applicable skills.

Based on the field findings, several important points were identified in the implementation of project-based learning. First, collaboration and social interaction become one of the important things, where students work in groups, share knowledge, and support each other in the learning process. This is in accordance with the teacher's expression, which revealed that through the zone of proximal development where the teacher challenges and supports them through collaboration guidance with classmates. The role of the teacher as a mentor is highly emphasized, by providing step-by-step guidance, direction, and support through scaffolding.[30] Teachers need to play an active role in facilitating student learning by providing guidance in stages so that students can achieve a deeper and more structured understanding through the project.[31] One of the PAK teachers stated that the implementation of project-based learning involves sharing and cooperative learning, in which the application utilizes sharing and cooperative learning so that students can maximize their abilities through interaction and utilization of peers, as a learning resource as well as a facilitator, for example guiding, providing facilities, and problem-solving situations. The construction process occurs collectively.[32] Project-based learning is a highly relevant method for preparing students for the 21st century with critical thinking, problem-solving, and collaboration skills. There are obstacles in integrating this theory, such as the lack of active involvement of some students in the project and the lack of parental support in providing the required resources, such as tools and materials. This is due to the economic background of the students, who mostly come from the lower middle class.[33] The implementation of project-based learning in SMA Negeri I Kauditan, supported by Vygotsky's theory of constructivism, emphasizes the importance of social interaction through collaboration between students and the role of the teacher as a mentor. Through this approach, students are encouraged to work in groups, share knowledge, and receive appropriate guidance through scaffolding to achieve deeper understanding.

3. *Impact of Project Based Learning Model on Problem Solving Students of SMA Negeri I Kauditan.*

Problem solving ability is an important skill that must be mastered by students in the 21st century, especially in facing complex challenges in the real world; therefore, the application of effective learning models is important in helping students develop these skills. Project-based learning is one of the learning models specifically designed to improve students' problem-solving skills through real projects that are relevant to the subject matter. Through project-based learning, students are invited to be actively involved in planning, managing, and completing projects, both individually and in groups, with the support of teachers as mentors.

Based on the interview results that the implementation of project-based learning has a significant and positive impact, they emphasized that project-based learning helps students improve critical thinking skills, creativity, and initiative. Most teachers also mentioned that through project based learning, students become more independent in completing tasks, more skilled in analyzing problems, and more able to work in teams to find solutions, motivating students to be more active in the learning process, encouraging them to think more critically, and providing opportunities for students to be directly involved in real situations. The

---

[28] Hasil Wawancara Dengan DO, Salah Satu Guru SMA Negeri I Kauditan.
[29] Hasil Wawancara Dengan NW, Guru PAK SMA Negeri I Kauditan.
[30] Hasil Wawancara Dengan PM, Salah Satu Guru SMA Negeri I Kauditan.
[31] Hasil Wawancara Dengan E, Salah Satu Guru SMA Negeri I Kauditan.
[32] Hasil Wawancara Dengan NW, Guru PAK SMA Negeri I Kauditan.
[33] Hasil Wawancara Dengan NW, Guru PAK SMA Negeri I Kauditan.

implementation of project based learning has a positive impact on students' problem-solving skills, as students tend to become more skilled in analyzing problems, designing solutions, collaborating, and in critical thinking skills, the ability to work together in teams.[34]

The application of project-based learning had a positive impact on students. This method has been proven to improve students' critical thinking skills, creativity, initiative, and independence in tasks completion. Teachers noted that students became more skilled in analyzing problems and working together in teams to find solutions. This model also encourages students to be more active in the learning process and engage directly with real situations, which helps them develop critical thinking and problem-solving skills. In addition teachers, students also feel an improvement in problem-solving skills as expressed by student respondents that the project-based learning model greatly influences the way they solve problems. During project-based learning projects prioritize real learning, they learn to face challenges directly and think creatively, which makes them feel better and more confident.[35] I agree with another student who revealed that project-based learning is very helpful, and I feel better at solving problems.[36] The implementation of project-based learning is proven to improve students' problem-solving skills. This method not only encourages students to think critically, creatively, and take initiative but also builds independence in solving tasks and problems.

Results of Project Based Learning Implementation on the Development of Students' Problem Solving Skills.
    1.   *Evaluation of the effectiveness of Project Based Learning in Improving Students' Problem Solving Skills.*
Evaluating the effectiveness of at project-based learning model in improving students' problem solving skills is an important part of contemporary education. The project-based learning method, which actively involves students in real, relevant projects, is designed to develop their critical thinking, creativity, and problem-solving skills. Through this evaluation, we can identify the extent to which project-based learning succeeds in achieving its goal of improving students' ability to face challenges both independently and through collaboration.

Various methods have been used to evaluate the effectiveness of project-based learning in improving students problem-solving skills. One is looking at the final result of the project that has been done.[37] Unlike the teacher, who stated that the assessment of the process is also important, by paying attention to how students face challenges during the project.[38] Self-reflection and debriefing are often used to ensure students' understanding, where they are asked to reflect on the problem-solving process they go through.[39]

There was a positive change in problem-solving ability through the implementation of the project-based learning model. Students stated that project-based learning has improved their analytical skills, creativity, and critical thinking abilitie. They felt a significant impact on a more systematic, collaborative, and structured way of thinking when facing challenges. Some students also felt more confident and disciplined in completing projects, as this model encouraged them to work together in teams, divide tasks according to their strengths, and face problems with a more creative approach. Although some students admitted to having difficulties, the majority felt better at solving problems, with new skills in identifying problems, conducting research, and designing solutions based on the data. Collaboration among students was also cited as an important factor that helped students face challenges and efficiently solve project problems. The application of the project-based learning model in SMA Negeri I Kauditan had a significant impact on improving students' problem-solving skills.

Based on the field findings, the implementation of project-based learning has a positive impact on students' problem solving ability, as students tend to become more skilled in analyzing problems, designing solutions, and collaborating in critical thinking skills and the ability to work together in teams. The effectiveness of the project-based learning model has a positive impact on students' problem-solving skills. Project-based learning encourages students to think critically, creatively, and collaborate in facing challenges.[40]

    2.   *Suggestions and Strategies for Improving the Implementation of Project Based Learning.*
The implementation of project-based learning in schools has great potential to develop students' skills, such as critical thinking, collaboration, and problem-solving. Although it has been proven effective in improving student learning outcomes,

---

[34] Hasil Wawancara Dengan JW, Kepala Sekolah SMA Negeri I Kauditan.
[35] Hasil Wawancara Dengan FD, Salah Satu Siswa SMA Negeri I Kauditan, Kauditan, 24 September 2024 pada pukul 09:28-09:33 WITA).
[36] Hasil Wawancara Dengan VR, Salah Satu Siswa SMA Negeri I Kauditan, Kauditan, 24 September 2024 pada pukul 09:35-09:40 WITA).
[37] Hasil Wawancara Dengan SMP, Salah Satu Siswa SMA Negeri I Kauditan, Kauditan, 24 September 2024 pada pukul 10:00-10:09 WITA).
[38] Hasil Wawancara Dengan DT, Salah Satu Guru SMA Negeri I Kauditan, Kauditan, 24 September 2024 pada pukul 10:15-10:20 WITA).
[39] Hasil Wawancara Dengan AAB, Salah Satu Guru SMA Negeri I Kauditan.
[40] Hasil Wawancara Dengan JW, Kepala Sekolah SMA Negeri I Kauditan.

some challenges still arise in the implementation process, such as a lack of resources, time constraints, and the need for support from all parties, including teachers and parents. Therefore, it is important to formulate suggestions and strategies that can improve the quality of project-based learning implementation so that this method is more optimal for achieving learning objectives.

The suggestions and strategies proposed by the teachers are several steps that can be taken to improve the application of project-based learning model to develop students' problem-solving skills, namely ensuring that the projects are relevant to students' real life so that they are more motivated and can apply the skills they have learned in real situations.[41] In addition, increasing collaboration between students through more intensive teamwork can help in the problem solving process, because students can share ideas and solutions. More structured scaffolding has also been proposed to support students in overcoming project challenges. Based on the interviews, to improve its implementation, teachers should be more active and play the role of facilitators. They should also not appear to allow students to independently search for problems. Instead, teachers should assist students according to their problem-solving ability. In addition, teachers can offer scaffolding, guidance, or keys to their students to make learning easier, without facing challenges in the early stages of learning. Teachers can provide more tasks to students when they feel more capable.[42]

The teacher as a companion and encourager play a very important role in guiding students as well as providing the necessary support during project work. In addition, the involvement of parents is also very important, as they can provide moral support and additional resources that help students maximize there completion of the project. With good collaboration among teachers, students, and parents, it is expected that the application of project-based learning models can run more effectively and provide optimal results in developing students' problem-solving skills.

IV.CONCLUSIONS

The implementation of the project-based learning (PjBL) model has proven to be effective in improving students' problem-solving skills by providing a significant positive impact on students' critical, analytical, and creative thinking skills. Through real projects that are relevant to everyday life, students are given the opportunity to be actively involved in the learning process so that they can hone their skills in identifying problems, designing solutions, and working together in teams. Teacher evaluations show that both the end result of the project and the process of working on the project provide a clear picture of the development of students' skills when facing challenges. Most teachers felt that assessing the process of the project was as important as the end result, as it could show the extent to which students could overcome obstacles and challenges in problem-solving. Some teachers even used self-reflection and debriefing methods to ensure students' understanding of the steps taken to solve problems, which in turn improved their ability to think critically and creatively.

Students experienced a significant change in their ability to solve problems after project-based learning. Based on the open-ended questionnaire, about 90% of the students revealed that they felt more confident, skillful, and systematic in facing challenges, as well as more collaborative work in groups. They acknowledged that project-based learning provides opportunities to develop critical thinking skills, identify problems, and design solutions based on the available data. Some students also feel that project-based learning helps them become more disciplined in completing tasks, as this model encourages them to work together, divide tasks, and face problems in a more creative and structured way. Collaboration between students becomes an important factor in the problem solving process, they can find more efficient and effective solutions through discussion and exchange of ideas.

While the implementation of project-based learning has a positive impact, there are still challenges that must be faced. Limited time, resources, and support from various parties, including teachers and parents, often become obstacles that hinder the optimization of this model. Therefore, it is important to formulate strategies to overcome these challenges. Some steps that can be taken to improve the effectiveness of project-based learning include ensuring that the project is relevant to students' real lives, which can motivate them to be more involved and apply the skills they have learned in a concrete situation. Increased collaboration between students also needs to be considered by encouraging more intensive teamwork so that they can share ideas and solutions in the problem solving process. In addition, the application of more structured scaffolding is proposed to support students in overcoming project challenges by providing guidance gradually according to their abilities.

The teacher's eole as a facilitator and companion in the learning process is crucial. Teachers need to be more active in accompanying students during the project, providing direction and assistance as needed without reducing the challenges. Teachers are also advised to provide scaffolding, such as providing tips or problem-solving keys in the early stages of learning, so that students can feel more confident and able to face greater challenges at a later stage. Parents' involvement is also very important, as they can provide moral support and additional resources that help students complete the project more optimally. With good collaboration among teachers, students, and parents, it is expected that the application of project-based learning models can run more effectively and provide optimal results in developing students' problem-solving skills. In addition, by focus on to all of these aspects, it is expected that the project-based learning model will continue to develop and make a greater contribution to improving the quality of learning in the future.

---

[41] Yahya Herman Liud, Johan Atang, and Julio Eleazer Nendissa, "Exploring Jesus' Teaching Methods: Effective Strategies for 21st-Century Education," *Journal Didaskalia* 7, no. 2 (2024): 74–84.
[42] Hasil Wawancara Dengan NW, Guru PAK SMA Negeri I Kauditan.

REFERENCES

Amahorseya, Michaela Zebada Faustina Agrippine, and Sjafiatul Mardliyah. "IMPLIKASI TEORI KONSTRUKTIVISME VYGOTSKY DALAM PENERAPAN MODEL PEMBELAJARAN KELOMPOK DENGAN SUDUT PENGAMAN DI TK ANAK MANDIRI SURABAYA." *Jurnal Buah Hati* 10, no. 1 (March 30, 2023): 16–28. https://ejournal.bbg.ac.id/buahhati/article/view/2024.

Anggraini, Putri Dewi, and Siti Sri Wulandari. "Analisis Penggunaan Model Pembelajaran Project Based Learning Dalam Peningkatan Keaktifan Siswa." *Jurnal Pendidikan Administrasi Perkantoran (JPAP)* 9, no. 2 (August 16, 2020): 292–299. https://journal.unesa.ac.id/index.php/jpap/article/view/9902.

Creswell, John. *Research Design: Pendekatan Kualitatif Dan Mixed*. Yogyakarta: Pustaka Belajar, 2017.

Leorince, Leorince, Yehezkiel Vicky Fernando, Aminus Bayage, and Rivki Aprianggi Laka. "Kualitas Guru Pendidikan Agama Kristen Dalam Mendidik Generasi Z Di Era Digital." *EDUKATIF : JURNAL ILMU PENDIDIKAN* 4, no. 5 (September 7, 2022): 6775–6787. https://www.edukatif.org/index.php/edukatif/article/view/3864.

Liud, Yahya Herman, Johan Atang, and Julio Eleazer Nendissa. "Exploring Jesus' Teaching Methods: Effective Strategies for 21st-Century Education." *Journal Didaskalia* 7, no. 2 (2024): 74–84.

Nendissa, J. E. "Peran Orang Tua Kristen Dalam Mencegah Anak Yang Kecanduan Game Online Dikaji Dari Perspektif Fondasi Pendidikan Kristen." *Jurnal Teologi Praktika* 5, no. 1 (2024): 18–30.

Nendissa, Julio. "Peran Kitab Keagamaan Terhadap Perkembangan Iman Pemuda Gereja Dalam Pendidikan Kristen." *DIDASKALIA: Jurnal Pendidikan Agama Kristen* 2, no. 2 (2021): 44–55.

Nendissa, Julio Eleazer. "Pentingnya Partisipasi Pemuda Dalam Pembangunan Jemaat: Studi Kasus Pada Gereja Masehi Injili Minahasa Syaloom, Karombasan." *KHARISMATA: Jurnal Teologi Pantekosta* 5, no. 1 (July 24, 2022): 66–80. https://e-journal.stajember.ac.id/index.php/kharismata/article/view/108.

Nursanjaya. "MEMAHAMI PROSEDUR PENELITIAN KUALITATIF: Panduan Praktis Untuk Memudahkan Mahasiswa." *NEGOTIUM: Jurnal Ilmu Administrasi Bisnis* 4, no. 1 (2021): 126–141.

Pangaribuan, Rosdinar, and Jelty Juriaty Rumetor. "PERAN REMAJA DALAM PERTUMBUHAN GEREJA LOKAL." *Proskuneo Journal of Theology* 1, no. 1 (2024): 46–57.

Setiawan, Tiok, Juliana Margareta Sumilat, Noula Marla Paruntu, and Non Norma Monigir. "Analisis Penerapan Model Pembelajaran Project Based Learning Dan Problem Based Learning Pada Peserta Didik Sekolah Dasar." *Jurnal Basicedu* 6, no. 6 (October 17, 2022): 9736–9744. https://jbasic.org/index.php/basicedu/article/view/4161.

Setiyaningsih, Suci, and Heru Subrata. "Penerapan Problem Based Learning Terpadu Paradigma Konstruktivisme Vygotsky Pada Kurikulum Merdeka Belajar." *Jurnal Ilmiah Mandala Education* 9, no. 2 (April 22, 2023). https://ejournal.mandalanursa.org/index.php/JIME/article/view/5051.

Sugiyono. *Metode Penelitian Kuantitatif, Kualitatif, Dan Kombinasi (Mixed Methods)*. Bandung: Alfabeta, 2016.

———. *Metode Penelitian Kuantitatif, Kualitatif, Dan R&D*. Bandung: Alfabeta, 2021.

Suwandayani, Beti Istanti, Kuncahyono, and Ade Ika Anggraini. "POLA IMPLEMENTASI TEORI KONSTRUKTIVISME PADA PEMBELAJARAN TATAP MUKA TERBATAS DI SEKOLAH DASAR." *Taman Cendekia: Jurnal Pendidikan Ke-SD-an* 5, no. 2 (December 29, 2021): 609–618. https://jurnal.ustjogja.ac.id/index.php/tamancendekia/article/view/11472.

Wohon, Frimsi, Ferry Johnny Nicolaas Sumual, and Ristan Rakim. "Model Pembelajaran Blended Learning: Implementasi Pada Peningkatan Kompetensi Pedagogik Dan Kompetensi Profesional Dosen." *TELEIOS: Jurnal Teologi dan Pendidikan Agama Kristen* 4, no. 1 (June 29, 2024): 113–125.