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LITERATURE REVIEW: THE EFFECTIVENESS OF PROJECT-BASED LEARNING IN DEVELOPING SOCIAL AND COGNITIVE SKILLS OF SECONDARY SCHOOL STUDENTS

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Abstract

The effectiveness of project-based learning (PjBL) in developing social and cognitive skills of secondary school students. PjBL can create a learning environment that supports active and collaborative interaction among students, which contributes significantly to the development of social skills such as co-operation, communication and adaptation in groups. In addition, PjBL is also proven to be effective in improving students' cognitive skills, including critical thinking, information analysis, and creative problem solving. Through active engagement in relevant and challenging projects, students are motivated to learn and develop effective learning strategies. Overall, PjBL is a comprehensive learning approach that not only prepares students for academic challenges, but also supports the development of essential skills needed in future life and careers.

Keywords: Effectiveness, Project Based Learning, Social Skills, Student Cognitive, Secondary School.

Introduction

In the era of globalisation and rapid information technology, the education system is required to equip students with a variety of 21st century skills, including social and cognitive skills that are essential to face future challenges. Social skills include the ability to work in teams, effective communication, as well as empathy and tolerance for others. (Sitopu et al., 2024); (Guna et al., 2024); (Fawait et al., 2024).. Meanwhile, cognitive skills include critical thinking, problem solving, and creativity. To fulfil these demands, conventional learning methods that are passive are no longer considered adequate. (Kazula et al., 2022)..

Project-based learning (PBL) has been identified as one of the promising pedagogical approaches in meeting students' social and cognitive skills development needs. Project-based learning (PBL) is a pedagogical approach that focuses on student-

centred learning through their engagement in real and meaningful projects. (Oktavia & Ridlo, 2020). In PjBL, students are faced with a complex problem or challenge and are expected to design, plan and implement a project-based solution. This process involves research, collaboration and reflection, and encourages students to develop a range of skills, including critical thinking, problem solving, teamwork and communication. PjBL not only improves students' understanding of the subject matter, but also engages them in learning that is relevant to real life, thus preparing them better for future challenges. In PBL, students work collaboratively to complete a project that is challenging and requires the application of learnt knowledge. (Maknun & Herman, 2024)..

As a pedagogical method, PBL has great potential to create a dynamic learning environment and support the development of various student skills. Students not only learn from the curriculum content, but also from the process of teamwork, discussion, and reflection that occurs during project implementation. Various studies have shown that PBL can increase students' learning motivation, increase in-depth understanding of concepts, and improve social and cognitive skills. (Rahayu et al., 2021).

However, the effectiveness of PBL implementation in the secondary school context still requires further study. Factors such as teacher skills in implementing PBL, limited resources, and the diversity of student characteristics can affect the success of PBL in developing social and cognitive skills. (Sujatmiko & Saputra, 2023).. Therefore, this literature review aims to collect, analyse and synthesise existing research on the effectiveness of PBL in this context to provide a comprehensive picture of best practices and challenges faced in implementing PBL in secondary schools.

Thus, it is hoped that the results of this study can provide a strong basis for the development of more effective educational policies and practices in the development of students' social and cognitive skills through project-based learning in secondary schools.

Research Methods

The study in this research uses the literature method. The literature research method is a systematic approach used to collect, review and analyse existing information from various written sources, such as books, academic journals, reports and other articles. The aim is to gain an in-depth understanding of a particular topic, identify trends or debates in the field of study, and find gaps or further research needs. (Sahar, 2008); (Arikunto;, 2000). Through critical and synthetic analyses of the existing literature, researchers can sharpen their research focus, develop conceptual frameworks, and strengthen their scientific arguments. This process involves a careful search and assessment of the credibility and relevance of sources, and the results are often presented in the form of a literature review or theoretical framework that guides further research. (Fadli, 2021).

Results and Discussion

Effectiveness of PjBL in Developing Social Skills

Project-based learning (PjBL) is an educational method that encourages active student engagement through complex, relevant, and real-world project-based tasks. PjBL is problem-solving orientated and emphasises real processes and outcomes rather than theoretical mastery. The basic principles of PjBL include student-centred learning, collaborative skills, critical thinking, in-depth investigation and continuous reflection. (Mulyani, 2021). Students work in teams to design, implement and present their projects, which encourages responsibility, creativity and time management skills. These principles are integrated to create a dynamic learning environment conducive to the development of 21st century skills, such as effective communication, collaboration, and innovation (Nestiyarum & Widjaja, 2021). (Nestiyarum & Widjajanti, 2023)..

Social skills are a set of abilities that facilitate effective and harmonious interaction and communication with others. These skills include the ability to communicate verbally and non-verbally, build and maintain interpersonal relationships, work together in teams, empathise, and resolve conflicts constructively. Individuals with good social skills are able to express themselves clearly, listen actively, understand others' feelings and perspectives, and adapt their behaviour according to different social situations. Strong social skills not only support success in personal contexts, but also contribute significantly to professional success and broader social integration. (Lidinillah et al., 2024)..

Project-based learning (PjBL) has been proven effective in developing students' social skills through its project-centred approach, which demands intense collaboration, communication and interaction. In a PjBL environment, students are given complex tasks or projects that require teamwork to complete. This situation forces students to communicate effectively, discuss ideas, and solve problems together, which in turn strengthens their verbal and non-verbal communication skills. By constantly interacting and collaborating with their peers, students learn to appreciate others' perspectives and build stronger interpersonal relationships. (Aziz & Astuti, 2023).

In addition, PjBL encourages the development of empathy skills and responsiveness to the needs and feelings of others. In the process of working on a project together, students often encounter challenges that require understanding and consideration for their group mates. For example, students may have to adjust how they communicate or work to ensure that each team member feels valued and heard. This process teaches students to be more sensitive to the emotions and circumstances of others, which is an important component of social skills (Varghese, 2021).

PjBL also provides opportunities for students to learn to resolve conflicts constructively. In project teams, conflicts and disagreements often arise for a variety of reasons, such as differences in viewpoints, division of tasks or time pressure. In the

context of PjBL, students are encouraged to confront and resolve these conflicts through open dialogue and negotiation. They learn effective problem-solving strategies and ways to reach compromises that benefit all parties. This ability is essential in everyday and professional life, where conflicts are inevitable. (Amer & Al-juboori, 2024).

Finally, PjBL strengthens students' self-management and social responsibility skills. Through the project, students learn to manage their time, develop a work plan, and commit to the task at hand. They also learn to take responsibility not only for their own work, but also for the team's overall performance. This responsibility integrates social skills with project management skills, so students are better prepared to face complex challenges in the future. Thus, the effectiveness of PjBL in developing social skills is not only evident in the academic context, but also prepares students to become better and collaborative members of society.

Effectiveness of PjBL in Developing Cognitive Skills

Cognitive skills are mental abilities used to process information, learn new things, remember, solve problems, and make decisions and judgements. These skills include aspects such as perception, attention, memory, language, thinking, and visual-spatial perception. In the fields of education and psychology, cognitive skills are important in understanding how individuals learn and function in everyday life. (Samson & Yango, 2023).. The ability to think critically, analyse information, and apply knowledge in new situations is an integral part of these skills. Cognitive skills are necessary to thrive in academic, professional, and social environments, as they help individuals to adapt and overcome the various challenges they face (Rao et al., 2023). (Rao et al., 2024).

Working memory is particularly relevant for secondary school students as it is a component of cognitive skills that allows them to store and manipulate temporary information. In the learning environment, working memory is responsible for helping students remember instructions delivered by the teacher, follow steps in solving maths problems, as well as connect newly learnt concepts with existing knowledge. This ability is important for tasks such as answering essay questions that require the integration of various information or organising information for a research project. (Marjuki, 2022).

Critical thinking and problem solving are other important components that are of great benefit to high school students. Critical thinking encompasses the ability to analyse, evaluate and make judgements based on available information. It enables students to tackle academic challenges by identifying problems, evaluating possible solutions, and choosing the best strategy to achieve their goals. (Turyati et al., 2020). In the classroom, critical thinking is required for text interpretation, analysis of scientific data, and discussion of social or ethical issues. Problem solving assists students in navigating complex academic tasks as well as everyday situations that require judgement. (Hindun et al., 2024).

Information processing and decision-making are components of cognitive skills that are also very important for secondary school students. Information processing involves the ability to filter, organise and synthesise data from various sources, which is essential in today's digital age where students are often exposed to a wealth of information. These skills help them in conducting research, preparing papers, or working on group projects. Decision-making, on the other hand, requires good judgement and the ability to consider the consequences of different options. (Maknun & Herman, 2024).. This is important not only in the academic context but also in the development of their social skills and self-management. Through effective decision-making, students can learn to plan and prioritise their tasks, as well as manage time to achieve academic and personal success. (Bandjar et al., 2024)..

Attention and concentration are components of cognitive skills that ensure students can focus on their academic tasks without being easily distracted by external or internal distractions. The ability to sustain long-term attention is critical in activities such as listening to a teacher's explanation, reading lengthy material, or working on an exam that requires a long duration of time. (Syamsuri et al., 2021). This skill helps students absorb and understand information in depth, note important points in lessons, and complete assignments on time. In today's digital era, where distraction from technology is high, the ability to focus attention becomes even more crucial (Sury et al., 2022).

Language and communication skills are also a highly relevant component of cognitive skills for secondary school students. They include understanding spoken and written language, as well as the ability to convey thoughts and ideas clearly and effectively. In an academic context, language skills influence how students understand reading materials, follow instructions and participate in class discussions. Good communication skills are also required in essay drafting, presentations and group work, where students need to be able to articulate their opinions, listen actively and contribute to discussions. (Hidayah et al., 2022)..

Metacognition, or awareness and understanding of one's own thought processes, is a component of cognitive skills that equips students with the ability to organise and monitor their learning. Metacognition involves planning how to approach a particular task, monitoring understanding or progress during task execution, as well as evaluating the effectiveness of the strategies used. This skill is particularly important for secondary school students as they are expected to become increasingly independent in their learning. By developing metacognition, students can recognise their strengths and weaknesses, adapt to more effective learning techniques, and improve their overall academic performance. (Razak, 2021).

Project-based learning (PjBL) is a pedagogical approach that focuses on active learning through projects that are contextual and relevant to students' lives. PjBL provides opportunities for students to engage deeply in the learning process, allowing

them to develop a range of cognitive skills. As students investigate, plan and implement the projects, they are encouraged to think critically, solve problems and make complex decisions, all of which contribute to the enhancement of higher-order cognitive thinking skills (Nurhasanah et al., 2015). (Nurhasanah et al., 2024)..

Furthermore, PjBL is also very effective in sharpening students' attention and concentration skills. In working on a long-term project, students need to be able to manage their time, focus their attention on multiple interrelated tasks, and complete each step carefully and thoroughly. This requires them to practise deep and sustained concentration in different roles, from research to final presentation. Minimal distractions and more active involvement in the project allow students to maintain better focus and concentration. (Alkan & Çavuşoğlu, 2024).

In addition, PjBL strengthens language and communication skills and promotes the development of metacognition. Students need to communicate effectively with their group mates, teachers, and other parties related to the project. They have to convey their ideas clearly, work together in solving problems, and discuss their progress or obstacles. In the process, students naturally develop their metacognitive skills by planning learning strategies, monitoring project progress, and reflecting on what they have learnt. This PjBL method encourages personal responsibility and independent learning, allowing students to understand and control their own learning so that their cognitive skills develop holistically. (Vonny et al., 2023)..

Project-based learning (PjBL) has been proven effective in significantly developing students' cognitive skills. One of the key elements that makes PjBL effective is its learning approach that encourages students to actively participate in the learning process. Students not only passively receive information, but also interact directly with the material through enquiry, experimentation and collaboration. This stimulates critical and analytical thinking skills that are essential for understanding and solving complex problems. (Senjayani, 2021).

The effectiveness of PjBL is also reflected in the development of metacognitive skills. In order to complete the project, students are required to plan the steps to be taken, monitor their own progress, and assess and reflect on the results of their work. This process not only strengthens self-regulation and decision-making skills, but also helps students develop more effective learning strategies. As such, students become better able to evaluate and modify their approach to solving problems and achieving learning goals. (Galeno et al., 2024)..

In addition, PjBL enriches communication and collaboration skills among students. Complex projects often require solid teamwork, where each group member contributes with their unique abilities and perspectives. Group discussions, presentations of project results, and Q&A sessions encourage students to communicate effectively, listen actively, and articulate ideas clearly. These interactions not only enrich

comprehension of the material, but also strengthen interpersonal abilities and important public speaking skills (Widyasmah et al., 2020)..

Finally, PjBL shows a positive impact in motivating students and increasing their engagement in the learning process. As students are involved in projects that are relevant to their interests and lives, they tend to be more motivated and eager to learn. They feel more responsible for their own learning, which ultimately improves satisfaction and learning outcomes. This increased motivation has a direct impact on the development of students' cognitive skills, as motivated students tend to more actively explore, question and think critically.

Overall, PjBL is a highly effective approach in developing students' cognitive skills. By actively engaging students in relevant and interesting projects, PjBL stimulates critical thinking, strengthens metacognitive skills, encourages collaboration and effective communication, and increases learning motivation. This approach not only prepares students for academic challenges, but also equips them with essential skills needed for success outside the school environment.

Conclusion

Project-based learning (PjBL) is significantly effective in developing the social and cognitive skills of secondary school students. PjBL provides a learning environment that supports active and collaborative interaction among students, which in turn strengthens social skills such as co-operation, effective communication and adaptability in groups. Project assignments require discussion, exchange of ideas, and joint contributions, all of which contribute to students' social development and enhance their interpersonal competence.

In addition to social skills development, PjBL is also effective in improving students' cognitive skills. The project-centred learning process allows students to practice critical thinking, analysing information and creative problem solving. Active engagement in relevant and challenging projects stimulates learning motivation and helps students develop effective learning strategies. PjBL provides opportunities for students to organise and control their learning process, which strengthens metacognitive abilities such as planning, self-surveillance, and reflection. Thus, PjBL not only prepares students for academic challenges, but also supports them in developing essential skills for everyday life and the future world of work.

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