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The Effect of Using the Learning Studio Application on Students' Reflective Thinking Skills After Internship

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Abstract

This study aims to examine the effect of using the Learning Studio Application on students' reflective thinking skills after Industrial Internship (Prakerin) on the material of composition functions and inverse functions. The study used a descriptive qualitative approach with 21 12th grade Pharmacy students at SMK Muhammadiyah 7 Gondanglegi as subjects. Data were collected through observation sheets, questionnaires, and interviews, then analyzed using data reduction, data presentation, and conclusion drawing techniques. The results showed that students' reflective thinking skills were in the good category, especially in the evaluation and conclusion indicators, which were supported by the use of feedback in the application. Interview findings confirmed that the Learning Studio helped students identify difficulties, evaluate errors, and develop learning strategies after the Prakerin. This study concluded that the Learning Studio Application has the potential to be an effective learning medium to support the recovery and strengthening of students' reflective thinking skills after the Prakerin.

Keywords: First keyword; Second keyword; Third keyword; Fourth keyword; Fifth keyword

Abstrak

Penelitian ini bertujuan untuk mengkaji pengaruh penggunaan Aplikasi Studio Belajar terhadap kemampuan berpikir reflektif siswa pasca Praktik Kerja Industri (Prakerin) pada materi fungsi komposisi dan invers fungsi. Penelitian menggunakan pendekatan kualitatif deskriptif dengan subjek 21 siswa kelas XII Farmasi di SMK Muhammadiyah 7 Gondanglegi. Data dikumpulkan melalui lembar observasi, angket, dan wawancara, kemudian dianalisis menggunakan teknik reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian menunjukkan bahwa kemampuan berpikir reflektif siswa berada pada kategori baik, terutama pada indikator mengevaluasi dan menyimpulkan, yang didukung oleh pemanfaatan umpan balik dalam aplikasi. Temuan wawancara memperkuat bahwa Studio Belajar membantu siswa mengidentifikasi kesulitan, mengevaluasi kesalahan, dan menyusun strategi belajar setelah Prakerin. Penelitian ini

menyimpulkan bahwa Aplikasi Studio Belajar berpotensi menjadi media pembelajaran efektif untuk mendukung pemulihan dan penguatan kemampuan berpikir reflektif siswa pasca Prakerin

Kata kunci: Kata kunci pertama; Kata kunci kedua; Kata kunci ketiga; Kata kunci keempat; Kata kunci kelima

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Introduction

Technological developments over the past two decades have accelerated significantly and had a major impact on various sectors, including education. Digital transformation is marked by the emergence of mobile devices, cloud computing, artificial intelligence, and increasingly widespread internet connectivity. These advances have enabled the creation of a more dynamic, open, and accessible learning ecosystem (Hobbs, 2020). In education, technology no longer serves merely as a tool but has become an integral part of the learning process. Digital learning platforms, Learning Management Systems (LMS), interactive applications, and the use of multimedia are now standard in improving the quality of instruction and student learning experiences. Technology also enables more personalized, adaptive, and collaborative learning, adapting to the needs and development of increasingly diverse learners (Redecker, 2017).

The development of digital technology has brought about significant changes in the world of education. The learning process is now moving towards a more interactive, flexible, and student-centered system. Teachers are no longer merely information transmitters but are also required to be able to integrate technology to make the learning process more effective and relevant to 21st-century needs. This is increasingly important given the characteristics of digital generation students who have fast, visual, and collaborative learning styles, thus requiring a different learning approach than previous generations (Sulistyarini et al., 2021). One form of technology-based learning innovation is the use of the Studio Belajar application. This media provides various learning resources such as interactive videos, practice questions, and automatic evaluations that encourage students to learn independently. Through these features, students not only passively receive information but are also encouraged to analyze, reflect, and correct any conceptual errors they encounter. Thus, the use of this digital application has the potential to increase student engagement and depth of understanding of the material being studied (Marhamah & Faradila, 2023). For students after Industrial Work Practice (Prakerin), learning challenges become more complex. After undergoing work experience, many students experience decreased motivation and difficulty readjusting to classroom learning routines. The transition from a practical work environment to theoretical learning often leads to difficulties in mastering concepts and a decrease in enthusiasm for learning. Therefore, learning strategies are needed to help students regain focus, engagement, and enthusiasm for learning after internship (Muhammad & Susiani, 2023). In these circumstances, reflective thinking skills play a crucial role. This ability helps students evaluate their learning and work experiences and then relate them to the theories learned in school. Students with strong reflective skills tend to more easily grasp new concepts because they are able to meaningfully connect experience and knowledge. Therefore, strengthening reflective thinking can be key to helping students adjust after returning from internship (Wastuty et al., 2024). Reflective thinking skills have indicators consisting of 1) describing problems, 2) identifying problems, 3) evaluating, and 4) concluding (Nabilah et al., 2023). Teachers are not only tasked with ensuring the material is conveyed but also with rekindling students' enthusiasm and reflective thinking patterns. This is where technology can play a role as an engaging and motivating learning medium for students. Through the use of interactive digital media, teachers can help students rebuild critical, analytical, and reflective thinking habits in the learning process (Syafly & Junaidi, 2023). In this regard, the Learning Studio application is a potential alternative. This application allows students to review errors, correct them independently, and monitor their learning progress over time. These features provide space for students to learn at their own pace and needs, while fostering a sense of responsibility for the

learning process itself. With proper implementation, Learning Studio can help students strengthen their conceptual understanding, especially in abstract and complex material (Zaidan et al., 2024).

Various previous studies have discussed the use of digital learning media and the improvement of students' reflective thinking skills. However, most studies still focus on regular learning and have not specifically examined the conditions of post-Prakerin students who have different characteristics and learning needs. In addition, studies on the use of digital learning applications generally focus more on improving learning outcomes or motivation, while their impact on post-Prakerin students' reflective thinking skills is still relatively limited. Based on this description, this study has a novel focus, namely analyzing the effect of using the Learning Studio Application on post-Prakerin students' reflective thinking skills, specifically on the material of composition functions and inverse functions. This study not only examines the use of digital media but also places reflective thinking skills as a key aspect developed in students with learning experiences in the world of work. Thus, this study is expected to provide theoretical contributions in the development of technology-based learning as well as practical contributions for teachers in designing more adaptive learning strategies for post-Prakerin students.

2. Methods

This study uses a descriptive qualitative approach with the aim of understanding in depth how the use of the Learning Studio Application can affect students' reflective thinking skills after carrying out Industrial Work Practice (Prakerin) activities. This approach was chosen because it allows researchers to explore the meaning, experience, and changes in students' learning behavior in a real context. The research subjects consisted of 40 12th grade Pharmacy students who had completed Prakerin and used the Learning Studio Application in the mathematics learning process on the material of Composition Functions and Inverse Functions. Data collection techniques were carried out through three main instruments, namely observation sheets, reflective thinking questionnaires, and in-depth interviews. The observation sheets were used to observe student activities during the learning process using the Learning Studio Application, with a focus on reflective thinking indicators.

A reflective thinking questionnaire was administered to obtain data on students' perceptions regarding the extent to which they reflected on their learning experiences and changes in understanding after using the application.

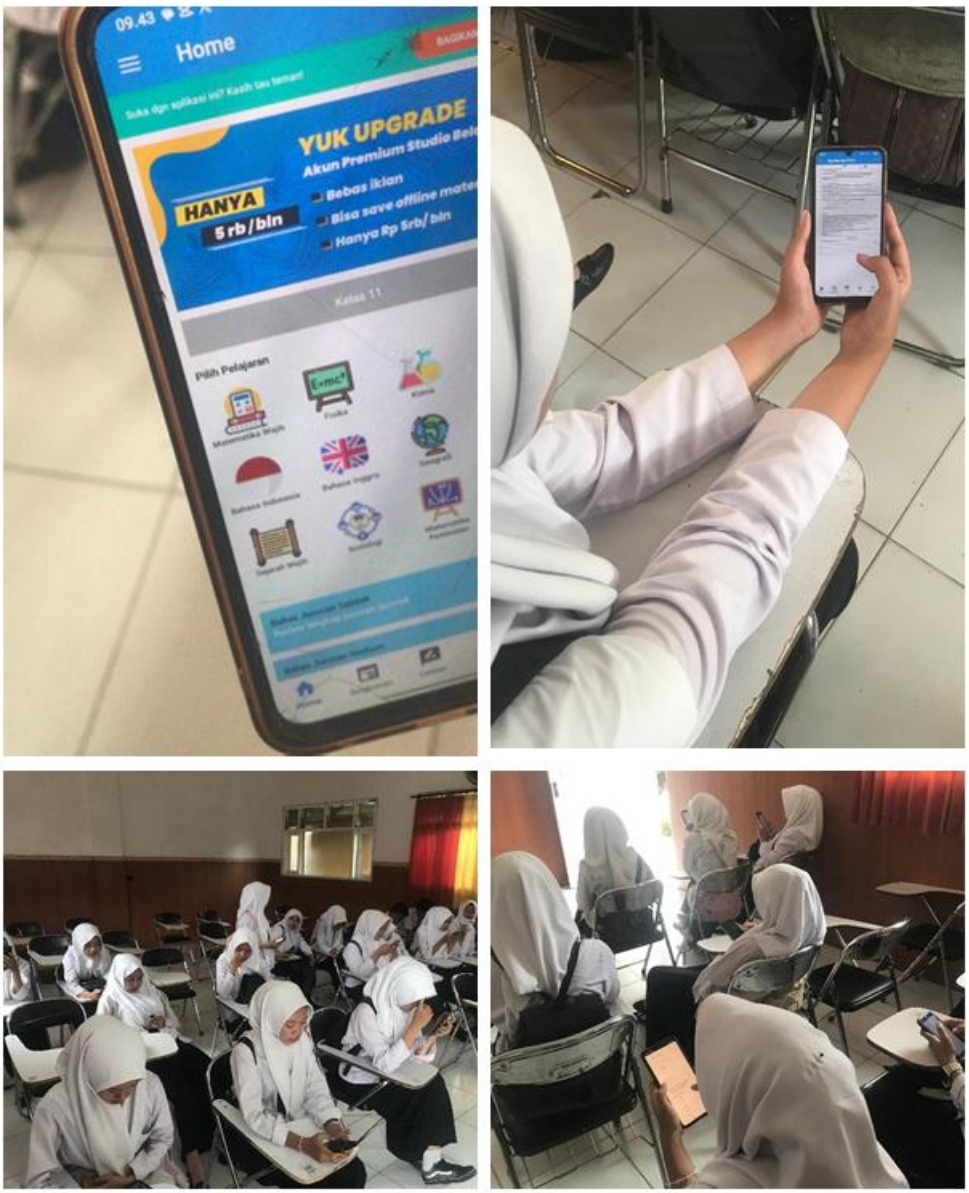
Meanwhile, in-depth interviews were conducted with several selected students to obtain more detailed information regarding their experiences, challenges, and the benefits of using the application on their reflective thinking process.

Data analysis techniques were carried out through three main stages: data reduction, data presentation, and conclusion drawing. In the data reduction stage, all results from observations, questionnaires, and interviews were selected and simplified to focus on information relevant to the research objectives. The reduced data were then presented in narrative form, tables, and interview quotations to facilitate interpretation. The final stage was conclusion drawing, which is the process of summarizing research results based on the data that has been collected and analyzed. To ensure the data obtained is correct and reliable, the researcher used data triangulation, namely comparing results from various instruments such as observations, questionnaires, and interviews. This method ensures more accurate and

accountable research results. The data analysis methods used in this study are categorized based on (Wardana et al., 2023).

3. Results and Discusion

The results of this study were obtained from three data collection techniques, namely observation, questionnaires, and interviews with 21 class XII Pharmacy students of Muhammadiyah 7 Gondanglegi Vocational School who had completed Industrial Work Practice (Prakerin) activities. The focus of the analysis was directed at students' reflective thinking skills after participating in learning using the Learning Studio Application on the composition function and inverse function material.



Gambar 1. Pembelajaran menggunakan aplikasi Studio Belajar

The learning process using the Studio Belajar application took place in a relatively conducive classroom environment, although not all students were able to participate simultaneously. Of the 40 registered students, only 21 were present and actively engaged in the

learning process due to various factors, such as permits and post-internship conditions. However, the students who participated in the learning demonstrated quite good engagement, particularly in observing the material, completing exercises, and responding to feedback provided by the application.

Based on the observation results, students generally demonstrated good reflective thinking skills. The problem description indicators obtained average scores of 4.09 and 3.76, indicating that most students were able to re-explain the core problem and the objective of the problem in their own words. This indicates that the use of the Learning Studio helped students understand the problem before entering the solution stage. However, there were still some students who were not fully consistent in expressing the purpose of the problem in detail, especially on problems that require a more abstract conceptual understanding.

For the problem identification indicator, the average score ranged from 3.81 to 3.95. This finding indicates that students are beginning to recognize areas of the material that are causing difficulties and identify critical information needed to solve problems. Observations indicate that the application's practice and discussion features encourage students to recognize their mistakes, although this process still requires guidance for some students who tend to be passive.

The evaluation indicator showed the most prominent results, with the highest average scores of 4.29 and 4.43. Students actively reviewed the completion steps and utilized feedback from the application to correct errors. This finding indicates that the Learning Studio plays a significant role in developing self-evaluation habits, which were previously relatively low among post-internship students. Meanwhile, the conclusion indicator also ranked well with average scores of 4.14 and 4.00, indicating that students are beginning to be able to draw conclusions from the learning process and recognize aspects that need improvement in subsequent learning.

Tabel 6. Angket Kemampuan Mendeskripsikan Masalah

No.	Pernyataan	Skor					Rata-rata
		1	2	3	4	5	
1.	Saya dapat menjelaskan kembali inti permasalahan dari materi yang saya pelajari melalui Studio Belajar.	1 4,76%	0 0%	4 19,05%	14 66,67%	2 9,52%	3,76
2.	Saya merasa kesulitan menggambarkan masalah yang harus saya selesaikan pada latihan soal.	0 0%	7 33,33%	9 42,86%	5 23,81%	0 0%	2,91
	Total	0,5 2,38%	3,5 16,67%	6,5 30,95%	9,5 45,24%	1 4,76%	3,34

The questionnaire results confirmed the observation findings, with the problem description indicator showing an average score of 3.34, indicating that students' abilities were in the good category. Most students were able to understand and explain the problems contained in the learning materials after using the Learning Studio Application. However, some students still had doubts about describing the problem comprehensively, especially when faced with questions that required a deeper conceptual understanding. This indicates that the ability to describe problems is not yet fully distributed across all students.

Tabel 7. Angket Kemampuan Mengidentifikasi Masalah

No.	Pernyataan	Skor 1	2	3	4	5	Rata-rata
1.	Saya dapat menemukan bagian mana dari materi yang membuat saya mengalami kesulitan.	0 0%	1 4,76%	4 19,05%	12 57,14%	4 19,05%	3,9
2.	Saya tidak menyadari penyebab kesalahan saya saat mengerjakan latihan soal.	1 4,76%	7 33,33%	9 42,86%	4 19,05%	0 0%	2,76
3	Saya mampu mengidentifikasi informasi penting yang diperlukan untuk menyelesaikan soal.	0 0%	0 0%	6 28,57%	9 42,86%	6 28,57%	4
	Total	0,33 1,58%	2,67 12,72%	6,33 30,15%	8,34 39,68%	3,33 15,87%	3,25

The problem identification indicator obtained an average score of 3.25, indicating that students' abilities were in the good category. This result indicates that students are beginning to recognize parts of the material or solution steps that are causing difficulties. However, not all students consistently recognized the causes of their errors when working on practice questions. This situation indicates that the problem identification process still needs strengthening, particularly in helping students identify the root causes of problems more systematically.

Tabel 8. Angket Kemampuan Mengevaluasi

No.	Pernyataan	Skor 1	2	3	4	5	Rata-rata
1.	Saya menilai kembali langkah-langkah yang saya lakukan saat mengerjakan latihan soal di Studio Belajar.	0 0%	0 0%	5 23,81%	14 66,67%	2 9,52%	3,86
2.	Saya jarang mengecek kembali apakah jawaban saya sudah benar atau belum.	2 9,52%	5 23,81%	4 19,05%	9 42,86%	1 4,76%	3,09
3	Umpan balik dari aplikasi membantu saya menilai kesalahan yang saya buat.	0 0%	0 0%	6 28,57%	12 57,14%	3 14,29%	3,86
	Total	0,67 3,18%	1,67 7,94%	5 23,81%	11,66 55,56%	2 9,51%	3,6

The evaluation indicator achieved the highest average score, at 3.54, indicating that students had relatively better evaluative skills than the other indicators. Most students stated that the feedback provided by the Learning Studio application helped them identify errors and improve their problem-solving steps. However, the questionnaire results also showed that some students were still not accustomed to double-checking their answers independently. This indicates that self-evaluation habits still need to be continuously cultivated.

Tabel 9. Angket Kemampuan Menyimpulkan

No.	Pernyataan	Skor					Rata-rata
		1	2	3	4	5	
1.	Saya dapat menarik kesimpulan dari hasil belajar saya setelah menggunakan aplikasi.	0 0%	1 4,76%	1 4,76%	16 76,19%	3 14,29%	4
2.	Saya sering bingung menentukan pelajaran apa yang sudah saya kuasai atau belum.	1 4,76%	10 47,62%	8 38,1%	2 9,52%	0 0%	2,52
3	Saya dapat merangkum kembali apa yang telah saya pelajari dalam bentuk pemahaman baru.	0 0%	1 4,76%	3 14,29%	15 71,43%	2 9,52%	3,86
4	Saya kesulitan menyimpulkan apa yang harus saya perbaiki pada pembelajaran berikutnya.	1 4,76%	5 23,81%	8 38,1%	7 33,33%	0 0%	3
	Total	0,5 2,38%	4,25 20,24%	5 23,81%	10 47,62%	1,25 5,95%	3,35

For the concluding indicator, the average score was 3.35, indicating that students' abilities were in the good category. Students were generally able to draw conclusions from the learning outcomes and summarize the material they had learned. However, some students still experienced confusion in determining aspects of their learning that needed improvement in the next meeting. This finding shows that the ability to draw conclusions has begun to form, but still requires guidance so that students are able to formulate learning reflections in a more focused manner.

The findings from the observations and questionnaires provide a general overview of students' reflective thinking tendencies, but they do not fully explain how the reflection process occurs in each student. Therefore, this study continued with in-depth interviews with three subjects purposively selected to represent the varying characteristics of students' reflective thinking abilities. This subject selection aimed to further explore their learning experiences, how students reflect on difficulties, and the strategies they use after participating in learning with the Learning Studio Application.

The interview results provided a more in-depth look at students' reflective thinking processes. In general, students recognized that internships had reduced the intensity of their practice and focus on mathematics. However, after using the Learning Studio, students reported greater assistance in understanding solution steps, evaluating errors, and rebuilding study habits. Students also demonstrated reflective awareness by suggesting improvement strategies, such as increasing study consistency, increasing practice problems, and optimally utilizing the app's features.

The findings of this study indicate that the use of the Learning Studio application positively contributes to students' reflective thinking skills after internship. Regarding the indicator of describing and identifying problems, the results of this study align with the theory of reflective thinking, which emphasizes the importance of initial understanding of problems as the basis for meaningful thinking processes (Sirait et al., 2025). A study by Nabilah et al. also showed that students who are accustomed to expressing problems in their own words tend to have better conceptual understanding (Nabilah et al., 2023). In this study, the video and

exercise features in Learning Studio served as initial stimuli that helped students build this understanding.

Regarding the evaluation indicator, this study's findings support the research of Anjomshoaa and Curry, which states that digital feedback can encourage self-evaluation and reflection on learning (Anjomshoaa & Curry, 2021). Students in this study showed a tendency to review their solution steps after receiving feedback from the app, indicating a positive reflection process.

The indicators concluded that students were beginning to formulate new understandings and recognize their own shortcomings. This finding supports the research of Wastuty et al., which asserted that reflection helps students connect learning experiences with new knowledge (Wastuty et al., 2024). The Learning Studio provides a space for students to carry out this process independently, so that learning does not stop at solving problems but continues to create meaning.

Previous research has generally focused on the influence of digital media on learning outcomes or student motivation in general, without specifically examining students' reflective thinking skills after internships. This study shows that the use of digital learning applications not only impacts material comprehension but also the reflective thinking processes of students re-adapting from the workplace to academia.

However, this study has limitations. First, the number of research subjects was relatively limited. Second, students' reflective abilities are still heavily influenced by internal factors such as motivation and study habits. Furthermore, the relatively short duration of application use did not fully allow for the development of a consistently high level of reflection across all students.

Based on these findings and limitations, further research is recommended involving a larger number of subjects, with a longer duration, and combining qualitative and quantitative approaches. Furthermore, developing a Learning Studio-based learning design that explicitly incorporates structured reflective activities is also an important recommendation for strengthening students' reflective thinking skills after internship.

4. Conclusion

The use of the Learning Studio application has a positive influence on students' reflective thinking skills after the internship on the composition function and inverse function material. The results of observations and questionnaires indicate that students have been able to develop reflective thinking skills in the good category, especially in the evaluation indicator, which is characterized by the ability to review the solution steps and utilize application feedback to correct errors. However, in the indicators of describing problems and identifying problems, some students still show doubts in understanding the problem completely and recognizing the source of the difficulties experienced.

Interview findings indicate that the use of the Learning Studio helps students readjust to learning after the internship, particularly in re-understanding problem-solving steps and developing reflective learning habits. Students are able to connect previous learning experiences with the material being studied and demonstrate awareness of learning strategies that need improvement. Thus, the Learning Studio application serves not only as a medium for delivering material but also as a tool that facilitates students' post-internship reflection process.

Teachers can utilize the Studio Belajar application as a learning support tool to help post-internship students develop reflective thinking skills, particularly through feedback, step-by-step exercises, and self-evaluation. Schools can also use these findings as a basis for

designing technology-based learning strategies that are more adaptive and responsive to the needs of students returning from workplace learning experiences.

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