

Design Thinking-based Learning Assessment Guidelines to Improve Students' Independent Learning Capability

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ABSTRAK

Kurang optimalnya penggunaan asesmen pembelajaran mempengaruhi penurunan kemampuan belajar mandiri menjadi latar belakang dalam penelitian ini. Penelitian ini bertujuan mengembangkan panduan asesmen pembelajaran berbasis design thinking yang valid, praktis, dan efektif digunakan dalam meningkatkan kemampuan belajar mandiri. Jenis penelitian ini adalah penelitian pengembangan dan Model penelitian yang digunakan pada penelitian ini adalah model ADDIE yang terdiri dari lima tahapan, yaitu *analyze*, *design*, *development*, *implementation*, dan *evaluation*. Subjek penelitian ini terdiri dari 4 ahli, 1 orang guru dan 38 siswa kelas IV sekolah dasar. Objek uji coba penelitian ini adalah kemampuan belajar mandiri siswa kelas IV sekolah dasar. Implikasi penelitian ini yakni panduan asesmen pembelajaran memudahkan guru dalam melibatkan peserta didik untuk mencapai capaian pembelajaran dan tujuan pembelajaran. Pengembangan panduan asesmen pembelajaran yang berbasis design thinking khususnya untuk meningkatkan kemampuan belajar mandiri siswa kelas IV sekolah dasar. Panduan ini dirancang untuk memfasilitasi pembelajaran yang mendorong siswa kelas IV untuk menjadi pembelajar mandiri dengan menggabungkan konsep-konsep design thinking dalam proses pengembangannya. Metode pengumpulan data yang digunakan adalah kuesioner/angket. Implikasi penelitian ini ialah meningkatkan kemandirian belajar. Dengan menekankan pada desain pembelajaran yang mendorong inisiatif dan tanggung jawab siswa atas proses belajar mereka sendiri, design thinking dapat membantu meningkatkan kemandirian belajar. Hasil penelitian menunjukkan bahwa data yang diperoleh signifikan yang artinya asesmen ini efektif dalam meningkatkan kemampuan belajar mandiri siswa kelas IV sekolah dasar.

ABSTRACT

The less-than-optimal use of learning assessment, which influences the decline in independent learning abilities, is the background of this research. This study aims to develop design thinking-based learning assessment guidelines that are valid, practical and effective for improving independent learning abilities. This type of research is development research, and the research model used in this research is the ADDIE model, which consists of five stages: analysis, design, development, implementation, and evaluation. The subjects of this research consisted of 4 experts, 1 teacher and 38 sixth-grade elementary school students. The object of this research test is the independent learning ability of fourth-grade elementary school students. This research implies that the learning assessment guide makes it easier for teachers to involve students in achieving learning outcomes and goals. Development of a learning assessment guide based on design thinking, especially to improve the independent learning abilities of fourth-grade elementary school students. This guide facilitates learning that encourages grade IV students to become independent learners by combining design thinking concepts in the development process. The data collection method used was a questionnaire. The implication of this research is to increase learning independence. By emphasizing learning design that encourages student initiative and responsibility for their learning process, design thinking can help increase learning independence. The research results show that the data obtained is significant, which means this assessment effectively improves the independent learning abilities of fourth-grade elementary school students.

1. INTRODUCTION

Independent learning ability is determining goals and solving difficult problems independently. In helping to develop students' academic abilities, the most important thing is to make students enjoy learning. By getting a perfect score, students can feel the joy and satisfaction of achieving targets with their abilities (Kurniawati & Hidayat, 2023; Trisiana, 2014). As stated in the Minister of Education and Culture Regulation Number 22 of 2022, regarding the strategic plan for realizing Indonesian students as lifelong learners who have global competence and behave according to Pancasila values with six main characteristics: faith, devotion to God Almighty and noble character, global diversity, cooperation, independence, critical reasoning and creativity. One of the important parts taught to elementary school students is independence. This includes students' independent attitude in participating in learning. Please encourage students always to be aware of the necessary needs independently so that they will be able to determine and carry out the learning process to achieve learning goals (Ismartoyo et al., 2017; Segara et al., 2021). This can be implemented with independent learning (self-directed learning). The ability to learn independently is one of the characteristics that play a role in forming individuals who can learn throughout life (lifelong learning). This can be achieved by applying the principles of independent learning (Hastini & Cholil, 2021; Studies et al., 2021). Schools' teaching and learning process certainly wants good results, but in reality, every learning process shows that not all students obtain satisfactory learning achievements. This can happen because the abilities and skills possessed by each student are certainly different for each (Gusnita et al., 2021; Isma et al., 2022; Suparlan, 2019).

The Merdeka Curriculum is the newest curriculum implemented in several schools as driving schools. The independent curriculum is a curriculum that is implemented and based on developing the profile of students so that they have the spirit and values contained in the Pancasila principles in their lives. The independent curriculum still prioritizes character education, one aspect of which is the ability to learn independently (Rosmana et al., 2022; Trisiana, 2014), where this curriculum frees students to learn and express their learning styles. Assessment and independent learning abilities have a close relationship in the context of education and personal development. Assessments can be used to assess the extent to which a person has independent learning abilities. The constructivism theory supports this; this theory views learning as an active effort by students to construct their knowledge, compare new information with previous understanding and use it to produce new understanding (Hamid et al., 2019; Ituga & Alman, 2023; Masgumelar & Mustafa, 2021).

Constructivism is an active activity where students construct their knowledge and seek meaning from what they learn. It is a process of completing new concepts and ideas with the existing thinking framework they already have. This includes assessing a person's ability to plan to learn (Dzulhidayat, 2022; Suparlan, 2019), managing time, setting personal learning goals, and evaluating their learning outcomes. This kind of assessment can help individuals understand their level of independence in learning. Well-designed assessments can encourage independent learning abilities (Gusnita et al., 2021; Hastini & Cholil, 2021). When a person is faced with assignments or projects that require independent research and understanding, this can trigger the development of independence in learning. For example, complex projects or research assignments may require individuals to search for and evaluate their sources (Rustam et al., 2024; Wulan & Nursaid, 2023).

Assessment results can be used to provide feedback to individuals about strengths and weaknesses in their independent learning abilities. Based on previous relevant research studies entitled "21st Century Educational Innovation: Application of Design Thinking and Project Based Learning in Education in Indonesia, which aims to determine 21st Century educational innovation by applying design thinking to project-based learning.) in education in Indonesia (Patras et al., 2019; Satria & Muntaha, 2022). The benefits of research based on research studies can be a source of fresh scientific references in academic circles and become new reading material and literacy sources related to education. It was also stated that design thinking is a way of innovating in dealing with people's needs and positioning humans as the center to increase the clarity of problem parameters and design mechanisms in the process of making policies and collaborating on systematic processes that are centered on humans as users or beneficiaries through a planned process so that they can produce changes in behavior and conditions according to expectations (Lafendry, 2022; Satria & Muntaha, 2022).

Based on a literature review titled "The Effect of Implementing Independent Learning on Ecosystem Material on Critical Thinking Skills and Problem-Solving Ability of High School Students in Metro Cities." This shows that ideal learning is student-oriented learning, where students try to construct their knowledge and become actively involved in searching for information. One way of learning that is expected to overcome these problems is through independent learning (Damayanti & Anando, 2021; Karmana et al., 2020). Independent learning requires motivation, tenacity, seriousness, discipline,

responsibility, will and curiosity to develop and advance knowledge. Many other information teachers in the classroom do not disseminate due to limited resources, knowledge and experience. In this way, the research equation lies in the application of independent learning to students' achievement of problem-solving skills and abilities. Meanwhile, differences in research exist in the research subjects studied or carried out.

The novelty of this research lies in developing a design thinking-based learning assessment guide to help students improve their independent learning abilities. Only a few students feel the benefits of independent learning because independent learning has not been socialized among students, and the culture of independent learning has yet to develop among students in Indonesia. They still think that teachers are the only source of knowledge. Still, some of them are successful in learning because they use independent learning or learning that is not focused on the presence of the teacher, face-to-face in class, and the presence of friends; we can see this indicator in the empowerment of school libraries, where certain students visited the school library. In some schools, it was even found that the library needed to be more modern and looked neglected. Face-to-face learning in class is needed to create intelligent and skilled students by being accompanied by structured and independent learning. Structured learning is different from independent learning. Structured learning means students learn according to the goals, plans, materials and resources determined by the teacher.

Similar problems were also found in the field, namely based on the results of interviews with the fourth-grade homeroom teacher at SD N 2 Banjar Anyar, where the results were that the teacher had made efforts to improve students' independent learning abilities during the learning process. However, the learning assessment used by the teacher needed to produce results fully. The results show that the stimulus still needs to achieve the desired learning objectives. Learning by involving assessments that assess students' independent learning abilities, such as design thinking-based learning assessments, will improve the learning process. This allows students to independently deepen their understanding of the material and reason about their learning abilities. Decreasing the ability to learn independently results in the learning outcomes of fourth-grade students at SD Negeri 2 Banjar Anyar needing to be more optimal.

Research on design thinking-based learning assessment guides is urgent in facing the demands of modern educational development. In the current era of information and technology, where the ability to learn independently has become an essential skill, assessment guides that integrate design thinking principles can be an important instrument for advancing the quality of learning. This guide can provide a conceptual and practical basis for educators to design assessments that measure conceptual understanding and stimulate creativity, problem-solving, and student learning independence. With attention to learning design emphasizing innovative and collaborative thinking, this guide encourages applying evaluation methods relevant to contemporary needs. In addition, this guide can guide the development of assessment instruments that provide a comprehensive picture of students' independent learning abilities, creating a learning environment that empowers them to become active and adaptive learners. In this way, this research helps improve the quality of learning in educational institutions. It provides a strong foundation for producing individuals ready to face future challenges, with learning independence as the main capital.

Based on the problems found in the field and the impacts that arise as a result of this, the solution that can be provided must be to develop innovative and critical reasoning learning assessment guides to improve independent learning abilities. The research objective of developing this learning assessment guide is to explore, design and upgrade a learning assessment guide that is more valid, practical and effective to improve students' independent learning abilities so that this will impact students' independent learning abilities. Based on this, the title adopted for this development research is "Development of a Design Thinking Based Learning Assessment Guide to Improve Independent Learning Ability in Fourth Grade Elementary School Students."

2. METHOD

Development research is research based on the design or manufacture of an effective product, starting with needs analysis, product development, and product testing, which is useful for the learning process in the classroom (Handoko et al., 2020; Nurhadi, 2020). This design thinking-based assessment guide development research uses the ADDIE model. The ADDIE model is a model that is used as a guideline in the process of developing effective, dynamic learning and providing support for the learning itself (Sari et al., 2021; Wicaksana et al., 2020). ADDIE is a systematic framework for large-scale instruction provision. The ADDIE model generally consists of 5 phases forming a cycle: analysis, design, development, implementation, and evaluation (Dewi et al., 2022; Spatioti et al., 2022). The research begins with an analysis phase, which aims to obtain data on product development needs, such as problems faced by students and teachers, availability of learning assessment guides, competencies achieved by students,

analysis of student characteristics, collecting information regarding learning assessment guides needed and expected by students as users. Data collection at the analysis stage was carried out using interviews and observation. After the analysis stage, the design stage continued with activities such as designing a design thinking-based learning assessment guide for the fourth grade at SD Negeri 2 Banjar Anyar. After the design activities and after receiving input from the supervisor, the development stage will be carried out and then developed into an assessment guide. The next implementation stage is carried out when the design thinking-based learning guide has been declared feasible and practical for learning. The final stage is the evaluation stage, which is carried out to obtain feedback on the development activities that have been carried out and to be carried out by concluding the effectiveness of the assessment guide being developed, as a hope of improving the product being developed.

Learning assessment guides are very important because they can hone students' abilities. The low ability of students to learn independently results in a decline in moral values in society. Teachers must be able to improve their students' achievements, teach creatively and innovatively, and develop their competencies. And must have the will to lead, innovate and make changes (Hutahaen et al., 2022; Patras et al., 2019). This type of research uses qualitative and quantitative approaches. To produce products that are valid for use. To test the validity of the learning assessment guide for the research subject development validation, it consisted of 4 experts, 1 teacher and 38 fourth-grade elementary school students. The object of this research trial was the independent learning ability of fourth-grade elementary school students using the data analysis method, namely mixed research methods. The method used in this study is the questionnaire method. The questionnaire method is a written statement regarding the learning assessment guidelines carried out and delivered to respondents. Questionnaires can be used to obtain personal information, such as respondents' desires, hopes, opinions, and attitudes. The questionnaire results are needed to determine the validity and practicality of the learning assessment guide being developed. The questionnaire consists of four questionnaires: a questionnaire for learning assessment experts, a questionnaire for learning design experts, a questionnaire for elementary school learning, and a questionnaire for students. Questionnaires for experts are used to collect data regarding the validity of the learning assessments.

In contrast, questionnaires are given to students to determine the assessments' practicality. The questionnaire method is used to obtain accurate data from the statements in the questionnaire (Agustini & Ngarti, 2020; Khoridah et al., 2019). Efforts to ensure the instrument's validity include forming an instrument grid, carrying out guidance with the supervisor, designing the instrument and testing the validity of the instrument's content. The instrument grid used in this research is presented in Table 1 for the learning assessment expert instrument, Table 2 for the practitioner response test instrument, and Table 3 for the learning independence instrument.

Table 1. Learning Assessment Expert Instrument

Aspect	Indicator
Cohesiveness	a. The relevance of learning assessment guides. b. Measurability of learning assessment guidelines.
Suitability of assessment function	a. Conformity to assessment principles.
Accuracy of assessment	a. The level of difficulty and complexity of the questions. b. Accuracy of question items with indicators. c. Accurate use of elements in the guide. d. Accuracy of the answer key to the question.
Informative	a. Accuracy of content. b. Complete guide. c. Ease of Access to information. d. Grammar
Reflection	a. Feedback

Source: modified from (Rizki et al., 2022)

Table 2. Practitioner Response Test Instrument

No	Aspect	Indicator
1.	Assessment presentation	Technical quality of assessment
2.	Quality of assessment	1. Quality of material content in the assessment 2. Quality of projects and questions based on HOTS questions

Source: modified from (Antara et al., 2022)

Table 3. Grid of Items for Aspects of Learning Independence

No	Aspect	Indicators of Competence Achievement
1	Self-confident	1. Have confidence in your abilities
2	Responsibility	2. Have a sense of responsibility
		3. Able to learn progressively independently
		4. Self-regulation
3	Don't depend on other people	5. Non-dependence on other people
4	Inisiatif Initiative	6. Behave based on your initiative
		7. Awareness of yourself and the situation you are facing
		8. Have curiosity and a desire to learn
5	Discipline	9. Can complete assigned tasks independently and on time
		10. Self-control
		11. Have enthusiasm for learning
		12. Have disciplined behavior

3. RESULT AND DISCUSSION

Result

This development research produces development products in the form of learning assessments. The learning assessment developed is a design thinking-based learning assessment to improve independent learning abilities in fourth-grade elementary school students. This guide was designed with the help of the Canva application. This assessment guide consists of 44 pages. The assessment guide has instructions, steps for working on a project from a problem, a skills assessment rubric, and questions that can hone students' independent learning abilities. Moreover, the questions are based on HOTS questions so that the learning assessment guide can be more interesting, creative, and innovative. The design thinking-based assessment guide contains five elements or stages of a human-centered approach to innovations to integrate people's needs as an act of designing a thought process to offer concrete solutions to solve complex problems by creating ideas (products, services, systems), namely empathize, define, ideate, prototype, and test. The first stage, the research begins with an analysis stage, which aims to obtain data on product development needs, such as problems faced by students and teachers, availability of learning assessment guides, competencies achieved by students, analysis of student characteristics, as well as collecting information regarding learning assessment guides needed and expected by students as users. Data collection at the analysis stage was carried out using interviews and observations. The target school at this analysis stage was SD Negeri 2 Banjar Anyar, Tabanan District.

The main problem students at SD Negeri 2 Banjar Anyar, Tabanan District, face is their' low independent learning skills. This can be seen from the percentage of students' independent learning ability in elementary school; 12 students are in the very poor category, and 12 students are in the low independent learning ability category. This means that only 26.3% of students have good independent learning abilities, but as many as 73.7% still need to be in the poor category. Apart from that, using learning media in the classroom still needs to be improved.

After the analysis stage, it continues with the second stage, namely the design stage, which is carried out with activities such as designing a design thinking-based learning assessment guide for fourth-grade students of SD Negeri 2 Banjar Anyar. This design stage starts with determining a learning outcome (CP) and learning objectives (TP). Learning outcomes and learning objectives will be a reference in developing a design thinking-based learning assessment guide related to aspects of the independent learning abilities of fourth-grade elementary school students. Next, the development material is packaged in a learning assessment guide. After the product design is complete, guidance is provided to the supervisor to get input/suggestions.

Based on the findings of the analysis stage, it can be identified that (1) teachers and students need learning assessments to optimize independent learning abilities; (2) the assessment guide developed can help students achieve the required skill competencies; and (3) an interactive learning assessment guide based on design thinking which was developed according to the characteristics of fourth-grade students at SD Negeri 2 Banjar Anyar. After the design activities and receiving input from the supervisor, the third stage will be carried out, namely the development stage, and then developed into an assessment guide. The assessment guide is made with the main material being glossy paper measuring 21 cm x 29.7 cm (A4). The learning assessment guide with the independent learning ability aspect consists of a cover page, foreword, table of contents, introduction, learning planning and assessment, implementation of learning

and assessment, processing of assessment results, bibliography, and back cover. The results of the design of the design thinking-based learning assessment guide are presented in Figure 1.



Figure 1. Design of Learning Assessment Guide

Apart from that, this assessment guide contains measurements of students' understanding of the concept of design thinking, students' ability to identify problems, generate creative ideas, or create prototypes and assessment rubrics to assess student performance. The rubric includes important criteria you want to assess, such as creativity, understanding of concepts, and collaboration. Validity testing was carried out after developing a design thinking-based learning assessment product. This development research was viewed by testing the validity of the learning assessment instrument according to learning assessment experts by carrying out an assessment guide involving four experts. After the four expert lecturers had completed the assessment, the assessment data was analyzed using the Aiken formula to determine the validity index and qualifications of the assessment guide. It was discovered that the learning assessment guide obtained an overall assessment validity index of 0.93 and fell into the range ≥ 0.8 , so the product developed has very high validity. From these calculations, it can be stated that the learning assessment guide has very high validity qualifications. Practicality testing in this development research involved 3 teachers who used a learning assessment guide. The results of the design thinking-based Learning Assessment Guide's practicality test were then analyzed to determine the practicality of the guide developed. Data analysis was carried out by calculating the percentage of scores obtained from sheets by experts. The data was then converted with a four-scale achievement level PAP conversion table to determine the practical qualifications of the guide being developed. The results of the practicality test can be seen in Table 4.

Table 4. Teacher Practicality Test Results

Teacher Practicality Test Results		Score
Amount		73%
Ideal Maximum Score		75%
Percentage		98%

Based on the results of the analysis of assessments by practitioners, the average percentage obtained, namely practicality by teachers, was 98%. The percentage results fall into the range of 76% - 100%. According to the PAP achievement level conversion table, if the overall percentage is 76% - 100%,

then the teacher's practicality is very good. This condition indicates that the Learning Assessment Guide is practical for use with very good qualifications. The fourth stage, the implementation stage, is carried out when the design thinking-based learning guide has been declared feasible and practical for learning. This stage aims to obtain feedback on the learning assessment guide product that has been developed. The activity is a field trial that will be used to determine the effectiveness of design thinking-based learning assessment guide products on the independent learning abilities of fourth-grade elementary school students. The fifth stage, namely the evaluation stage, is carried out to obtain feedback on the development activities that have been carried out and to be carried out by concluding the effectiveness of the assessment guide being developed as a hope for improving the product being developed. The prerequisite tests carried out in this research include the normality test of data distribution and the homogeneity of variance test. The complete analysis prerequisite test results are presented in [Table 5](#).

Table 5. Normality Test Results

Variable	Group	Statistic	df	Sig.
Independent Study	Pre-Test	0.947	38	0.073
Ability Test Results	Post-Test	0.945	38	0.063

Furthermore, for the homogeneity test results, the distribution of effectiveness test data in the research obtained a significant value of 0.103. So, based on these results, it can be seen that the Sig. < 0.05. The results of hypothesis testing in this research are presented in [Table 6](#).

Table 6. Hypothesis Test Results

Paired Sample	Paired Differences				t	df	Sig. (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Pair 1 Pre-Test - Post-Test	-12.10526	5.15589	0.83640	-13.79996	-10.41056	-14.473	37	0.000

The results of hypothesis testing in this research were based on a paired sample T-test and a correlated sample t-test. Based on the Paired Sample t-test/ Correlated Sample t-test analysis using the help of 97 IBM SPSS Statistics 22 for Windows programs, a significance value (Sig. 2-tailed) of 0.000 was obtained. Based on these results, it can be seen that the Sig. < 0.05. So, it can be concluded that H_0 is rejected and H_1 is accepted. In other words, there is a significant difference in the results of student's independent learning abilities before and after taking part in learning using a design thinking-based learning assessment guide. Thus, using design thinking-based learning assessment guides effectively improves students' independent learning abilities.

Discussion

Development research is research based on the design or manufacture of an effective product, starting with needs analysis, product development, and product testing, which is useful for the learning process in the classroom. This development research produced a development product in the form of an assessment guide that can be used to improve students' independent learning abilities ([Arifin et al., 2020](#); [Handoko et al., 2020](#)). The design thinking-based assessment guide is specifically for grade IV students. Learning is an effort process that involves mental activity that occurs within humans as a result of active interaction with their environment to obtain a change in the form of knowledge, understanding, behavior, skills and attitude values that are relative and lasting ([Ituga & Alman, 2023](#); [Ni'amah & M, 2021](#)). Research that has been conducted shows that: (1) Design thinking-based learning assessment obtained validity test results with an average assessment expert of 0.93 with very high qualifications, (2) the level of practical achievement by teachers was 98% with very high qualifications. Good, (3) as well as a learning assessment guide based on design thinking that effectively improves the independent learning abilities of fourth-grade school students. So, it shows a significant difference in students' independent learning abilities before and after using design thinking-based learning assessments. There are several reasons why design thinking-based learning assessments receive very good assessments from experts and practitioners and are effectively used in the learning process to improve student learning outcomes. Developing assessment guides is a very important role for several reasons. Namely, assessment is an

important part of coaching, and learning is the core business of education (Asrifah et al., 2020; Fanani et al., 2014).

Previous research also supports this, which aims to determine 21st-century educational innovation by applying design thinking to project-based learning in education in Indonesia. This research states that the design thinking approach effectively supports 21st-century learning (Jannah & Atmojo, 2022; Satria & Muntaha, 2022). Apart from that, this research is in line with a literature study entitled "Assessment in Learning" conducted by Iska Karti Anggia Putri in 2022 by raising the issue that learning is an integral part of the entire learning process so that assessment activities must be carried out by teaching staff throughout the learning process. The research aims to measure students' learning competence and the quality of education and improve the quality of inadequate education. This is similar to the research I conducted to measure competency and improve teaching and learning activities, which is divided into three main points that an educator requires: the ability to prepare material and teaching and learning activities and assess student learning outcomes (Putri., 2022).

The advantage of the design thinking-based learning assessment guide compared to similar products developed previously is that this learning assessment guide has 6 stages of a design thinking-based approach, which focuses on students' independent learning abilities (Lazuardi & Sukoco, 2019; Patras et al., 2019). This assessment guide is also interactive because it can provide a new atmosphere and increase each individual's interest and motivation in participating in the ongoing learning process. Limitations in this research lie in the scope of material, level and learning content developed in the learning assessment guide. This learning assessment guide is only limited to the content of the Civics subject. The number of subjects involved in testing the effectiveness of only 1 class was 38 people using the One Group Pre-Test-Post-Test research design. The implications of this research are as follows.

First, learning assessment guides to improve independent learning abilities also enrich efforts to improve the quality of independent learning abilities (Rosyidi, 2020; Trisiana, 2014). The learning assessment guide makes it easier for teachers to involve students in achieving learning outcomes and goals (Cholilah et al., 2023; Haryanti et al., 2021). Another factor that makes things easier for teachers is the main component in the form of guidelines, which contain gradual and structured instructions, guides or procedures to implement the learning process, which is carried out and can be used repeatedly. Second, the development of design-based learning assessment guides contributes to increasing the number of learning assessment guides that integrate the stages of learning implementation created using a design thinking-based approach. Teachers and students can use this learning assessment guide product in the learning process, effectively improving student learning outcomes. Third, developing a design thinking-based learning assessment guide can be used as a reference in developing similar products to improve the quality of learning. Design thinking is a learning model that, in the design process, can be used to solve a problem from a different point of view (Hikmah & Rusdianto, 2024; Kamil et al., 2022).

Understanding the problems and obstacles that occur in designing or planning makes it possible to put forward an appropriate solution to be developed. This is the case for students who are achieving problem-solving skills. Students need to receive guidance to explore basic ideas and steps and measure their creativity level. Therefore, design thinking is important to study because it consists of flexible process steps that can be used as an appropriate tool in teaching and learning to develop skills or achievements, including the ability to learn independently. Research on the development of design thinking-based learning assessment guides has several limitations, including the development of design thinking-based learning assessment guides being limited to fourth-grade students and the learning assessment guide being limited to only being based on design thinking. Developing design thinking-based learning assessment guides is based only on the ADDIE research model (Analysis, Design, Development, Implementation, and Evaluation) (Hikmah & Rusdianto, 2024; Lazuardi & Sukoco, 2019). Recommendations based on the limitations that have been conveyed are to conduct further development research to develop related assessment guidelines with the scope of material, level and learning content developed in a broader learning assessment guide.

This study has several limitations that need to be noted. First, the scope of the research is limited to developing a design thinking-based learning assessment guide only intended for fourth-grade students, so the results may need to be more generalizable to a wider learning context. Second, testing the guide's effectiveness only involved one class with a limited number of subjects, and the One Group Pre-Test-Post-Test research design may need to be more powerful to guarantee the overall effectiveness of the guide. Nevertheless, this research has the advantage of being compatible with modern approaches to the learning process, which can increase student interest and motivation. The assessment guide is also designed to be interactive to increase student involvement in learning. The implications of this research include improving the quality of learning by facilitating a more holistic and integrated evaluation process

and contributing knowledge and skills for teachers in designing effective assessments, especially using a design thinking approach.

4. CONCLUSION

Developing a design thinking-based learning assessment guide can improve the independent learning abilities of fourth-grade elementary school students. The validity of the design thinking-based learning assessment guide is to obtain assessment results with very good qualifications from learning assessment experts so that this teaching material is suitable for use and can be implemented. The practicality of the design-based learning assessment guide generally obtains assessment results with very good qualifications based on practitioners' responses. Furthermore, there is a significant difference in the results of students' independent learning abilities before and after taking part in learning using a design thinking-based learning assessment guide. Thus, the application of design thinking-based learning assessment guidelines in the effective learning process influences improving the results of students' independent learning abilities.

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