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Development and Feasibility Testing of ProProfs-Based Digital Assessment Media to Improve Science Learning Evaluation in Grade IV Elementary Madrasahs

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Abstract

This research aims to develop and test the feasibility of assessment media for IPAS (Natural and Social Sciences) subjects based on the Proprofs digital application for grade IV MI/SD students. The background of this research is the low motivation of students to learn in the evaluation of IPAS, the majority of whom still use conventional methods (Paper Based Test/PBT), as well as the lack of use of digital media in the IPAS assessment process. This study uses the Borg and Gall model Research and Development (R&D) method which is simplified into three main stages: preliminary study, development and testing, and implementation. The product developed is the Proprofs Quiz Maker digital application. The results of the feasibility test from the validator show that the Proprofs assessment media is included in the criteria of Very Appropriate and Appropriate. In detail, the total percentage of acquisition from material experts is 95% (Very Appropriate), media experts 92.5% (Very Appropriate), and learning evaluation experts 70% (Appropriate), with a total average score obtained from validators of 85.8%. In addition, the results of a small group trial of 41 students in grade IV of MI Al Hidayah Lajukidul also showed an overall score of 94%, which was included in the Very Feasible criteria. Following product revision and subsequent implementation in the main and operational field trials involving a total of 82 students from Grade IV at MI Al-Hidayah, an overall score of 96% was obtained, classified under the Very Appropriate criteria. This demonstrates that the development of Proprofs-based IPAS assessment media is highly feasible, effective, and can significantly increase student motivation and learning outcomes.
Keywords: Assessment Media; Digitalization; Proprofs; IPAS; Madrasah Ibtidaiyah

Introduction

In the digital era, the use of information technology has a major impact on education (Ober et al., 2025). The use of information technology in learning has become a necessity to increase the effectiveness of the student learning process as well as efforts to realize modern learning (Siyam et al., 2025). Digitization of education encourages the learning process both as a means to support the implementation of learning, as well as a solution for educators to liven up the atmosphere in the classroom, as well as provide a more interesting learning dimension so that learning takes place effectively and efficiently

(Sapta & Nisa, 2024) (Shahzad et al., 2025). Emerging technologies can experience rapid growth and have a great impact in the world of education, which is characterized by a high level of integration as well as completely new innovations (Hemminki-Reijonen et al., 2025). Learning that utilizes current technology is able to encourage students to be more enthusiastic (David & Weinstein, 2024), not only in following the learning process, but also in doing various practice questions as part of the assessment process. Assessment is an important component in the learning process, because through assessment it can be known the extent of the quantity of traits or abilities possessed by a person (Tabinska, 2025) (Orim et al., 2025), and the achievement of learning goals or expected outcomes (Aarnio et al., 2025). The potential of classroom assessment must be harnessed through technological innovation for broader educational transformation (Bankole & Ayanwale, 2025).

Digital assessment and electronic assessment are concepts chosen from a variety of different terms (online assessment, computer-aided assessment, and so on) that are used in research to demonstrate assessment processes that use different types of technology (Jurāne-Brēmane, 2023). Especially during the Covid-19 pandemic, the assessment process is also carried out online, so it requires the use of digital technology (van den Berg, 2025). However, currently, digital-based assessments and information technology are not only applied in online learning, but are also used in the classroom as an effort to increase students' motivation in doing practice questions. Other interesting findings show that learning motivation, when combined with a high sense of self-worth, control, and responsibility, confirms that the use of digital assessments has a positive impact on the learning process (Garcia, 2025).

This research distinguishes itself by focusing specifically on developing and validating the Proprofs Quiz Maker for IPAS assessment at the Madrasah Ibtidaiyah (MI) level, a niche area where digital media implementation is still rare. ProProfs is an interactive and easy-to-use digital assessment media in the learning process (Mardiana et al., 2021). The uniqueness of using Proprofs is its ability to replace conventional memorization methods with interactive, game-based activities, directly addressing the need for engaging evaluation, which is vital for improving student science literacy competencies (Prastyo et al., 2024). The future benefit of this development is providing educators with a feasible and efficient modern digital solution to conduct evaluation,

ultimately transforming assessment into a tool that not only measures learning but also actively enhances student motivation and outcome.

The assessment process using digital media has been applied to several subjects, such as Indonesian (Fadilla et al., 2023) (Amalia & Wirawati, 2023), Arabic (Rahman et al., 2022) and Islamic Religious Education (Asmara et al., 2025). The use of digital media for social studies subjects is still very rare. In fact, IPAS material, according to some studies, is difficult material for students in elementary school (Aini, 2024) (Swistiyawati & Indrayani, 2024) (Agustina et al., 2025). In elementary school, IPAS is a subject in the combined independent curriculum of natural and social sciences. The purpose of the IPAS subject is so that students can manage the natural and social environment as a unit. However, as mentioned above, IPAS learning often faces challenges such as low understanding of students' concepts due to uninteresting learning methods, lack of use of digital media in the learning process and assessment that results in lack of student involvement.

The reality on the ground in the IPAS assessment process, the majority of teachers use traditional methods. Questions are presented in written form even though with an authentic approach (Aulia et al., 2025), assessments in measuring science skills have not been carried out in a modern way (Tok & Ünal, 2020), (Hardiansyah et al., 2022) and in the evaluation at the end of learning, teachers are used to using conventional evaluation or what we often call PBT *(Paper Based Test).* In this PBT *(Paper Based Test)* model, students are given evaluation questions in the form of sheets of paper and then the teacher assesses them manually (Ratna Widya Wijayanti et al., 2023).

This reality seems to be similar to the findings at MI Al-Hidayah Lajukidul Tuban which were carried out through interviews and observations. According to DN, one of the grade IV teachers at MI Al-Hidayah, stated that 46.15% of students do not have motivation when participating in the learning of science subjects, one of the indicators is that in the evaluation process they get a low score or below the minimum passing score. Based on the results of the assessment carried out conventionally, namely using a written test, the average score obtained by students is 69. This shows that the lack of use of digital media in the learning process results in a lack of student learning outcomes. Furthermore, DN tries to improve classroom management by utilizing Proprofs media (DN, IPAS teacher, interview). This condition demonstrates a pressing educational problem that

requires innovative learning evaluation solutions to increase student engagement and assessment effectiveness. Digital assessment innovations, such as Proprofs, are needed to align with current educational demands and the shift toward technology-integrated learning environments.

This study was intentionally conducted at one targeted school, MI Al-Hidayah, due to its representativeness as a school with characteristics commonly found in Madrasah Ibtidaiyah: limited use of digital assessment tools, reliance on conventional assessment practices, and the presence of documented learning motivation challenges. Focusing on one school allows for in-depth development, testing, and controlled evaluation of the product during the early stage of Research & Development (R&D), consistent with Borg & Gall's model, which requires pilot testing on a limited scale before wider implementation. Therefore, selecting MI Al-Hidayah is both academically justified and methodologically appropriate to ensure the accuracy of evaluation results prior to broader application.

Conceptually, Proprofs.com is an online platform that has been utilized its potential as a means of assessment and learning (Sarip et al., 2024). Proprofs is a website or learning platform that provides a variety of opportunities to create and take online tests or quizzes in a practical way. This platform can be accessed through various digital devices such as computers, laptops, and smartphones. Proprofs is also equipped with a variety of interesting features, including Quiz Maker, Training Maker, Knowledge Base, Collaboration, Projects, Brain Games, Flashcards, Polls, and various other features (Boedi Maritasari & Lailani, 2025). Through this platform, educators can replace conventional memorization methods with more interactive and engaging game-based learning activities. Another practical implication of our study is that the ProProfs platform can be used as an efficient medium for providing online feedback, making the feedback cycle process easy so that learners can continue to improve their listening abilities and subskills (Baghit et al., 2024).

Proprofs allows users to combine different types of media, such as text, images, and videos, to create an engaging and interactive learning experience. Proprofs themselves were created to meet the needs of modern education as an effort to increase the effectiveness of the learning process, including in the evaluation of learning outcomes (Virdania et al., 2024). The use of these platforms increased especially during the COVID

19 pandemic, when many teaching shifted to an online format (Mardiana et al., 2021). Teachers are starting to use Proprofs to create assessments online, so that they can still assess students' abilities even in remote situations. Learning evaluation includes various forms of measurement and assessment that provide a comprehensive picture of student progress and the overall effectiveness of education.

Previous research presented by the researcher was divided into two, namely the use of digital-based assessment media in IPAS and the use of proprofs as a digital assessment medium. Previous studies have shown that assessment media in IPAS is carried out using Smart Apps Creator (SAC) media (Minta et al., 2025), the use of AI for IPAS assessment (Suhelayanti et al., 2024), the development of Articulate Storyline media in IPAS materials to improve student learning outcomes (Hidayati Rofiah et al., 2024), and research on the use of proprofs including: the use of Proprofs as a medium for assessing mathematics lessons is considered to improve student learning outcomes where students are required to interact in answering questions so that they do not get bored quickly (Novita Irawati & Al Ayubi, 2024), ProProfs also facilitates effective evaluation with direct feedback, as well as honing students' social skills and digital literacy (Arafani, 2024), the use of the Proprofs website for assessments in the form of crossword puzzles can improve student learning outcomes (Sinaga et al., 2025), and Proprofs as a medium for online assessments can increase student motivation (Nasution et al., 2023).

Based on previous studies, there has been no research that discusses the development of proprofs media as a digital-based assessment media in science subjects in elementary schools. Despite the rapid growth of digitalization in education, the application of digital assessment media in primary-level IPAS learning particularly in Madrasah Ibtidaiyah remains limited and underexplored. Previous studies have largely focused on the use of digital tools for learning delivery or assessment in other subjects, such as mathematics, language learning, or Islamic education, while research that specifically develops and systematically tests digital assessment media for IPAS subjects at the MI level is still scarce. In addition, existing assessment practices in many madrasahs continue to rely on conventional paper-based tests, which have been shown to contribute to low student motivation and limited engagement during evaluation activities. This condition reveals a clear research gap between the demands of educational digitalization and the availability of validated, subject-specific digital assessment media for IPAS in

Islamic primary education. Based on the identified problems, this research aims to answer: What are the characteristics of the development of IPAS Proprofs assessment media for plant material for class IV MI/SD?; What is the feasibility of IPAS Proprofs assessment media for plant material for class IV MI/SD based on the assessment of media experts, evaluation experts and student responses?

The primary goal of this research is to develop, test the feasibility, and demonstrate the initial utility of Proprofs-based digital media for IPAS assessment among Grade IV students at MI Al-Hidayah Tuban. This specifically aims to transform the conventional assessment method (PBT) into a more interesting and varied digital evaluation, serving as a foundational development study to address the local issue of low student motivation. While conducted at a single institution, this research successfully provides verified evidence of the product's quality and readiness for wider testing and implementation.

Methods

The type of research used is development research. The approach developed by Borg and Gall as a research model design in the field of education leads to products that can improve the quality of education. Therefore, the development and research methods used by researchers intend to test certain products, which already exist, develop certain products, and find certain products that are more effective and efficient. The Proprofs digital application is a product developed in this study.

The data of this study was collected using probability sampling techniques. This technique was chosen to ensure that the sample taken is truly representative of the population proportionally and objectively, so that the results of the study can be generalized more accurately. The sample in this study amounted to 82 students in grade IV of MI Al Hidayah, who were involved as respondents in filling out the assessment instrument for the Digital Assessment media. Through the probability sampling approach, data is obtained systematically and measurably, so that the quality of the data produced is more guaranteed in validity and reliability.

The Borg and Gall model consists of ten stages, namely: (1) research and information gathering, (2) planning, (3) development of the initial form of the product, (4) initial field trial, (5) revision of the main product, (6) the main field trial, (7) the

revision of the operational product, (8) the operational field trial, (9) the revision of the final product, and (10) dissemination and implementation (Safish et al., 2025). This research uses the Borg & Gall R&D Model which has been simplified by Sugiyono into three main stages. The first stage is *the preliminary study*, which includes steps 1–3 of Borg and Gall, which is initial research, planning, and initial product development. This stage aims to identify the needs as well as produce an initial prototype. The second stage is *development and testing*, including steps 4-7, namely initial trials, product revisions, field tests, and revisions based on the results of field tests. At this stage, the product is developed gradually until it reaches an optimal shape. The third stage is *implementation*, including steps 8-10, namely operational testing, final product revision, and dissemination. At this stage, mature products are implemented and disseminated for wider use (Assegaf et al., 2025). Through diagrammatic visualization, these ten stages can be clearly illustrated, presenting a logical flow from the development process to the implementation of a product or educational program, through figure 1.

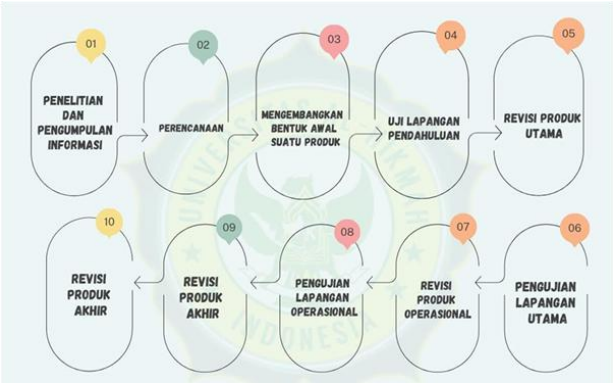


Figure 1
Steps Research and Development Borg and Gall
Source: author's creativity, personal documents

The instrument used in this study is a questionnaire with the measurement scale used is the Likert scale. Questionnaires are given to material experts, media experts, science teachers and students to be used as product feasibility instruments in the use of developed learning media, with the type of answers used in the form of a check list (√). The answer scores given for the expert and respondent validation questionnaires differed. The answer scores given by media and material experts can be seen in Table 1 and the answer scores for respondents can be seen in the following Table 2.

Table 1
Media and Material Expert Answer Scores

No.	Answer	Score
1.	Very appropriate	5
2.	Appropriate	4
3.	Quite appropriate	3
4.	Not appropriate	2
5.	Not very appropriate	1

Source: Personal Document

Table 2
Respondent's Answer Score

No	Answer	Score
1.	Very appropriate	5
2.	Appropriate	4
3.	Quite appropriate	3
4.	Not appropriate	2
5.	Not very appropriate	1

Source: Personal Document

The questionnaires in this study are divided into four types, namely:

First, Instruments for Media Members

The media expert instrument contains points about aspects related to learning media. The following is a grid for learning media expert instruments which can be seen in Table 3.

Table 3
Instrument Grid For Media Experts

Aspect	Indicator	Item No.
Navigation	Ease of use of navigation	1
	Accuracy of navigation layout	2
	Accuracy of navigation functions	3
Writing (text)	Font accuracy	4
	Font size accuracy	5
	Font color accuracy	6
	Text legibility	7
Language	Accuracy of language use	8
	Easy-to-understand language use	9
Appearance	Appropriate color selection	10
	Appropriate image use	11
	Appropriate image layout	12
	Appropriate background selection	13
	Media design consistency	14
Media presentation	Ease of use of media	15
	Media's ability to increase student learning motivation.	16
	Media's ability to increase student knowledge.	17
	Media's ability to encourage students to learn independently.	18

Second, Instruments for Subject Matter Experts

The instrument of the material expert contains points about aspects related to the learning material. The following is a grid for learning material expert instruments which can be seen in Table 4.

Table 4
Instrument Grid For Subject Matter Experts

Aspect	Indicator	Item No.
Contents	The suitability of the material to the Core	1
	The suitability of the material to the learning evaluation objectives	2
	The breadth of the material's content coverage	3
	The suitability of the material's explanation content	4
	The ease of understanding the material	5
	The suitability of the included examples	6
	The suitability of the evaluation questions to the material	7
Appearance	Suitability of presentation sequence of material	8
	Suitability of presentation sequence of evaluation questions	9

Source: Personal Document

Third, Instruments for Learning Evaluation Experts

The media expert instrument contains points about aspects related to learning media. The following is a grid for learning media expert instruments which can be seen in Table 5.

Table 5
Expert Evaluation Learning Instrument Grid

Aspect	Indicator	Item No.
Contents	Alignment of material with core competencies	1
	Agreement of material with objectives	2
	Learning evaluation	3
	Breadth of material content coverage	4
Language	Ease of language to understand	5
	Use of language according to Indonesian spelling (EBI)	6
	There are no double or ambiguous meanings	7
Appearance	Appropriateness of presentation sequence of	8
	Suitability of presentation of evaluation question sequence	9
	The order of presentation of the material is systematic and logical	10

Source: Personal Document

Fourth, Instruments for Students

Instruments for students can be reviewed in terms of convenience, motivation, attractiveness, and usefulness. The following is a grid of instruments for students which can be seen in Table 6.

Table 6
Instrument Grid for Students

Aspect	Indicator	Item No.
Convenience	Ease of use of media	1, 2, 3
	Ease of understanding the material	4, 5
Motivation	Interest	6
	Attention	7
Attractiveness	Display quality	8
	Attractiveness	9
Usefulness	Having a positive impact on students	10
	Enhancing student skills	11
	Providing assistance with learning	12

Source: Personal Document

After the trial data is successfully obtained, data processing is carried out. This study employed a Research and Development (R&D) design using the simplified Borg and Gall model, consisting of three stages: preliminary study, development and testing, and implementation. The research sample involved 82 Grade IV students of MI Al-Hidayah, selected using probability sampling to represent the target group in which digital assessment tools were still minimally used. Expert validators consisted of a material expert, a media expert, and a learning evaluation expert to ensure content validity and alignment with learning objectives. Data were collected through questionnaires, interviews, observations, and documentation. Quantitative data were obtained through Likert-scale instruments assessing feasibility and student responses (convenience, motivation, attractiveness, usefulness), while qualitative data were derived from feedback and interview notes. The independent variable was the Proprofs-based digital assessment media, and the dependent variables were expert feasibility scores and student response data. Quantitative data were analyzed using descriptive percentage techniques, supported by internal reliability testing with Cronbach's Alpha, while qualitative data were analyzed through thematic interpretation.

Ethical procedures included permission from the school, supervision by classroom teachers, voluntary student participation, and guaranteed confidentiality. Methodological

limitations include the use of a single research site, reliance on self-report measures, and device-based constraints that may influence implementation. Therefore, the findings should be viewed as initial evidence requiring broader testing and comparison with alternative assessment approaches to strengthen generalizability and theoretical expansion.

The data that will be analyzed from this study is from the trial subjects (students). The data will be processed using the percentage descriptive analysis technique, which is a method used to convert quantitative data into a percentage form and then interpreted in the form of qualitative sentences consisting of media expert data analysis, subject matter expert data, and initial trial data (students) (Suwandi, 2022).

The formula used for the questionnaire data per item is as follows.

$$P = \frac{X}{X1} \text{ X } 100\%$$

Explanation:

P : Percentage sought

x : Respondent's score for a single item

$x1$: Maximum score for a single question item

100% : Constant

The formula used for the overall questionnaire data items is as follows.

$$P = \frac{\sum X}{\sum X1} \text{ X } 100\%$$

P : Percentage sought

Σx : Total number of respondent's answer scores

$\Sigma x1$: The maximum overall score

100% : Constant (Sannuri, 2022).

The inference of media feasibility is identified by the percentage score value. The higher the percentage of scores in the data analysis, the higher the feasibility level of Adobe Flash-based IPAS learning media (Fayrus & Slamet, 2022). The criteria for the assessment results of validators and test subjects are presented in Table 7.

Table 7
Criteria for the Assessment Results of Expert Validators and Trial Subjects

Percentage	Description
81% - 100%	Very Appropriate
61% - 80%	Appropriate
41% -60%	Somewhat Appropriate
21% - 40%	Not Appropriate

Percentage	Description
0% - 20%	Not Very Appropriate

Source: Personal Document

Result

The results of the feasibility of the Proprofs application-based IPAS learning evaluation media were obtained from the results of validation of media experts, material experts, and learning evaluation experts with calculations using an equation formula (Novita Irawati & Al Ayubi, 2024), namely:

$$P \frac{\Sigma \times}{\Sigma \times 1} x\ 100$$

P : Percentage sought

Σx : Total number of respondent's answer scores

$\Sigma x1$: The maximum overall score

100% : Constant.

Tabel 8
Reliability Digital Assessment Media

	N	%
Cases Valid	41	100.0%
Excluded	0	.0%
Total	41	100.0%

Table 9
Reliability Statistic

Cronbach's Alpha	N of Items
.951	12

Source: Personal Document

Based on the results of the reliability test of the Digital Assessment Media instrument, it is known that the number of respondent data used in the test is 41 people, all of which are declared valid, without any data being issued (Excluded = 0). This shows that the instrument can be applied consistently to the entire research sample without any unqualified data.

Furthermore, the results of reliability testing using Cronbach's Alpha technique showed a value of 0.951 with a total of 12 statement items. Referring to the reliability interpretation criteria, Cronbach's Alpha values that are above 0.80 are in the very high category, so the research instrument can be declared very reliable or have an excellent level of internal consistency. Thus, it can be concluded that the instrument used in this

study is feasible and reliable to measure the aspects being studied because it is able to produce stable and consistent data.

After the quantitative data is calculated, then the results of the calculation are converted into qualitative values in the form of eligibility criteria which can be seen in Table 10.

Table 10
Expert Validator Assessment Results Criteria and Trial

Percentage	**Description**
81% - 100%	Very suitable
61% - 80%	Suitable
41% -60%	Quite suitable
21% - 40%	Not suitable
0% - 20%	Not very suitable

Source: Personal Document

Material Expert Validation Results

The validation of the material expert was carried out by Mr. DN as the Teacher of the Mapel IPAS MI Al Hidayah Lajukidul. The following are the results of validation by material experts. The results of the validation of the subject matter experts can be seen in Table 11 following.

Table 11
Results of Validation by Material Experts

Aspect	**Percentage**	**Description**
Contents	95 %	Very Suitable
View	92,5 %	Very Suitable
Quantity	93,7%5%%	

Source: Personal Document

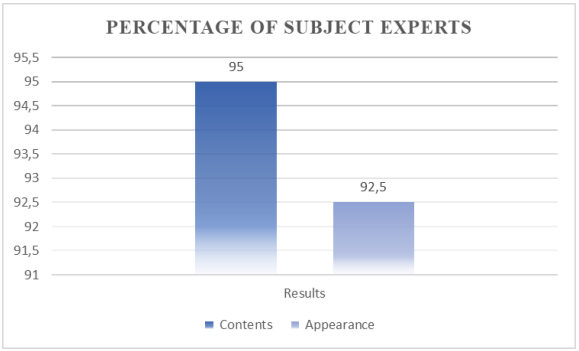


Figure 2
Results of Material Expert Validation
Source: author's creativity, personal documents

Figure 2 shows that the 95% representation is included in the feasible criteria, and the display aspect with a percentage of 92.5% is included in the very feasible criteria.

In addition to providing feasibility scores, the material expert also offered several constructive suggestions to enhance the quality of the developed assessment media. The expert recommended refining the wording of several questions to ensure conceptual clarity and alignment with the learning objectives of IPAS Plant material. It was also suggested that examples and contextual cases be adjusted to better reflect students' real-life experiences, thereby supporting meaningful learning and accurate measurement of students' conceptual understanding. These suggestions were incorporated during the revision stage to strengthen content validity and curriculum relevance.

Media Expert Validation Results

The validation of media experts was carried out by Mr. Sy as the IGI Tuban Center. The following are the results of validation by media experts.

Table 12
Media Expert Validation Results

Aspect	**Percentage**	**Description**
Navigation	93 %	Very Suitable
Text	94%	Very Suitable
Language	93 %	Very Suitable
Display	94%	Very Suitable
Media Presentation	91%	Very Suitable
Quantity	93%	

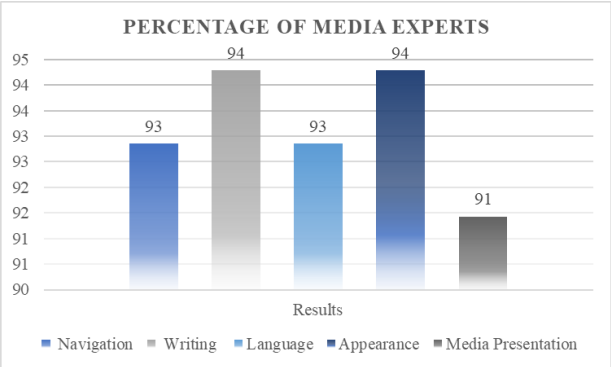


Figure 3
Percentage of Media Experts
Source: author's creativity, personal documents

Figure 3 is the result of validation that has been carried out by media experts in each aspect. The navigation aspect received a percentage of 93% included in the very appropriate criteria, the writing aspect received a percentage of 94% included in the very

appropriate criteria, the Language aspect received a percentage of 93% included in the very appropriate criteria, the display aspect received a percentage of 94% included in the very appropriate criteria, the media presentation aspect received a percentage of 91% included in the very appropriate criteria.

The media expert provided recommendations primarily related to the technical and visual aspects of the Proprofs-based assessment media. Although the media was rated as very appropriate, the expert suggested improving the consistency of visual elements, such as color combinations, icon usage, and layout alignment, to enhance user comfort and aesthetic appeal. Additionally, the expert recommended optimizing navigation flow to ensure smoother transitions between questions and clearer user guidance. These inputs were used to revise the interface design, making the media more user-friendly and visually engaging for elementary-level learners.

Results of Expert Validation of Learning Evaluation

The validation of learning evaluation experts is carried out by Mrs. RH as a learning evaluation expert, as a lecturer and has expertise in the field of basic education and learning evaluation. The following are the results of validation by learning evaluation experts.

Table 13
Results of Expert Validation of Learning Evaluation

Aspect	**Percentage**	**Description**
Language	75 %	Appropriate
Content	70 %	Appropriate
Presentation	75%	Appropriate
Quantity	73%	

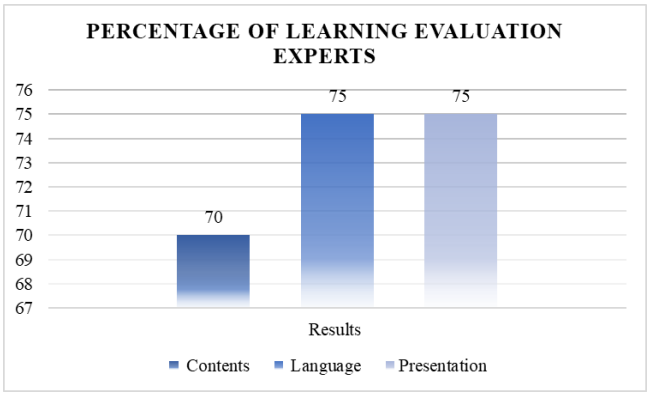


Figure 4
Percentage of Learning Evaluation Experts
Source: author's creativity, personal documents

In addition to the data obtained from the validation of learning evaluation, there are several suggestions for improving learning evaluation media. *First*, in terms of the presentation of quiz questions that are initially less sequential starting from easy to difficult levels, it is better to display them in order from easy to difficult levels in order. *Second, the* quiz questions contain material with the formula 5 W + 1 H so that the content of the questions can develop and make students more in-depth when analyzing the questions.

The assessment that has been carried out by validators of material experts, media experts and learning evaluation experts using validation sheets on the science learning evaluation media based on the proprofs application obtained good assessment results. With the existence of Proprofs-based science learning media, plant materials can support the evaluation of learning for fourth grade students of MI Al Hidayah Lajukidul. The following are the results of the validation and assessment that has been carried out by each validator.

Table 14

Percentage of Total Scores Obtained by Each Respondent

Respondents	**Percentage Score**	**Description**
Material expert	95%	Very Suitable
Media expert	92,5%	Very Suitable
Learning evaluation expert	70%	Suitable
Quantity		

Table 14 is the percentage of the total score obtained by each validator against the media Evaluation of IPAS learning based on Proprofs The percentage of the number of scores obtained can be described using the bar chart as follows.

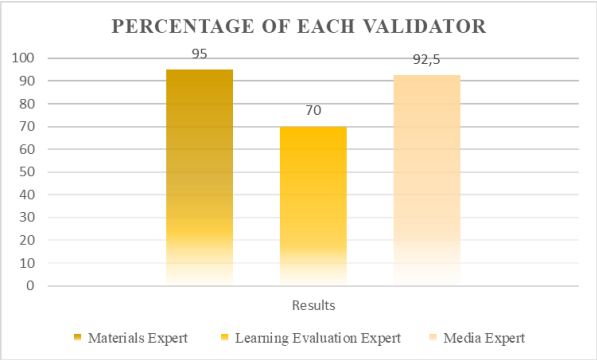


Figure 5
Percentage of Each Validator
Source: author's creativity, personal documents

Figure 5 is the result of the percentage of acquisition of the feasibility of Proprofs-based science learning media obtained from each validator. The percentage of the amount of acquisition by material experts of 95% is included in the criteria of very feasible, the percentage of the number of acquisitions by learning evaluation experts of 70% is included in the appropriate criteria, and the percentage of the number of acquisitions by media experts of 92.5% is included in the criteria are very appropriate.

The learning evaluation expert emphasized suggestions related to the structure and pedagogical quality of the assessment items. Specifically, the expert recommended arranging the quiz questions progressively from easy to difficult to better measure students' abilities in stages. In addition, it was suggested that questions incorporate the 5W + 1H format to encourage deeper analytical thinking rather than surface-level recall. These recommendations were considered essential to improve the evaluative function of the media, ensuring that the assessment accurately measures students' understanding and reasoning skills. Consequently, revisions were made to the question sequencing and construction prior to the operational field trial.

Product Trial Results

After validation by experts, including material experts, media experts, learning evaluation experts, then the media was tested in a small group of 41 grade IV students of MI Al Hidayah Lajukidul on Saturday, February 1, 2025. This trial in this small group was used to determine the feasibility of the learning evaluation media developed. From the results that were tested through a small scope, the respondents were asked the following results:

Table 15
Trial results

Convenience	89%	Very Appropriate
Motivation	98%	Very Appropriate
Attractiveness	91%	Very Appropriate
Usefulness	98%	Very Appropriate
Quantity	94%	

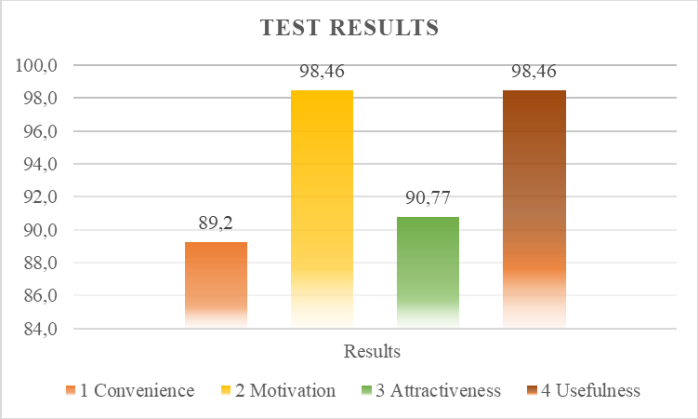


Figure 6
Trial Result of Small Group
Source: author's creativity, personal documents

Figure 6 is the result of student respondents to the social studies learning evaluation media based on the proprofs application at MI Al Hidayah Lajukidul. In the aspect of ease of showing a percentage of 89% including the criteria is very feasible, in the aspect of motivation showing a percentage of 98% is included in the criteria is very feasible, in the aspect of attractiveness showing a percentage of 91% is included in the criteria are very feasible, in the last aspect, namely the aspect of usefulness showing a percentage of 98% is included in the criteria are very feasible. So that in the results of the trial, an overall score of 94% was obtained, including in the very feasible criteria.

Operational Results

After being revalidated by experts, including material experts, media experts, and learning evaluation experts, after the media was tested on 82 fourth grade students of MI Al Hidayah Lajukidul on Saturday, February 8, 2025. This media was operated in a large group, this was used to determine the feasibility of the developed learning evaluation media. From the results of the trial through a larger scope, respondents were asked to provide the following answers:

Table 16
Operational Results

Convenience	96%	Very Appropriate
Motivation	95%	Very Appropriate
Attractiveness	93%	Very Appropriate
Usefulness	94%	Very Appropriate
Quantity	96%	

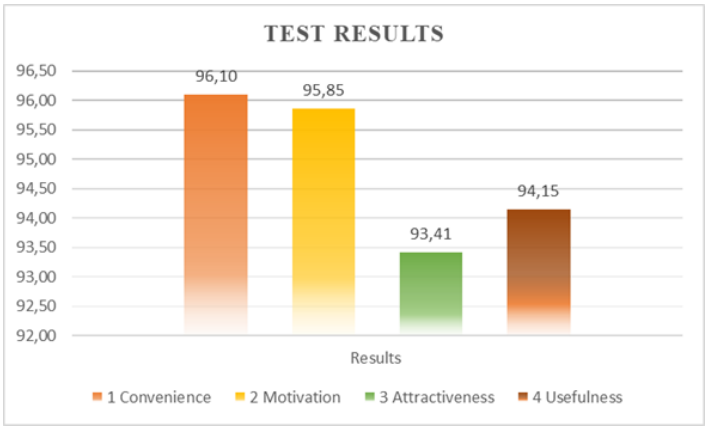


Figure 7
Operational Result of Large Group
Source: author's creativity, personal documents

Figure 7 shows the results of 82 students' responses to the proprofs application-based science learning evaluation media at MI Al Hidayah Lajukidul. In the aspect of ease, it shows a percentage of 96%, including the very feasible criteria, in the aspect of motivation, it shows a percentage of 95%, including the very feasible criteria, in the aspect of attractiveness, it shows a percentage of 93%, including the very feasible criteria, in the last aspect, namely the usefulness aspect, it shows a percentage of 94%, including the very feasible criteria. So that the results of the trial obtained an overall score of 96%, including the very feasible criteria.

The implementation of the Proprofs-based IPAS assessment media led to noticeable improvements in both student motivation and learning outcomes among 82 Grade IV students. Student response data from the operational field trial showed a motivation score of 95% (Very Appropriate), indicating increased interest, attention, and engagement during assessment activities compared to conventional paper-based tests. Classroom observations further revealed that students were more enthusiastic, actively involved, and confident when completing digital quizzes, supported by the interactive format and immediate feedback features. In terms of learning outcomes, prior evaluations indicated an average student score of 69, which was below the minimum competency standard; following the implementation of the Proprofs-based assessment, students demonstrated better understanding of Plant material concepts, as reflected in the usefulness score of 94% (Very Appropriate) and teachers' reports of improved accuracy in measuring student comprehension. These findings confirm that the use of interactive digital assessment media not only enhances student motivation but also supports

improved learning evaluation and conceptual understanding in IPAS subjects at the Madrasah Ibtidaiyah level.

Product Revision

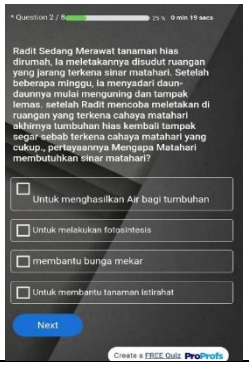
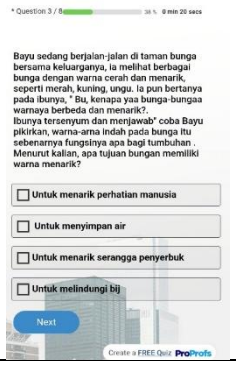
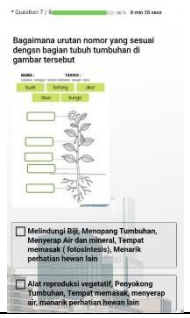
Products that have been validated by expert validators are then revised and tested to students before use. The following are presented the results of the revision *of the quis maker proprofs* based on input and direction from media experts, material experts and learning evaluation experts, which can be seen in Table 17 below.

Based on the results presented in Table 17, the revision process of the Proprofs-based digital assessment media reflects substantial improvements in both visual and pedagogical aspects. Before revision, the display of the assessment media tended to be less systematic, with several interface elements such as layout arrangement, font size, and color contrast not optimally supporting students' readability and focus. In addition, some images and icons used in the quiz interface were not fully representative of the learning content, which potentially caused confusion among students when interpreting questions.

After undergoing validation by media experts, material experts, and learning evaluation experts, the revised version of the media demonstrates clearer visual organization and improved consistency between images, text, and learning objectives. The revised images are more contextual, relevant to IPAS material, and visually aligned with students' cognitive development level. Instructions accompanying each item were also refined to be more explicit, reducing ambiguity during assessment activities.

Furthermore, before revision, several assessment items lacked precise alignment with indicators of science literacy. After revision, the images and supporting media were adjusted to better represent scientific phenomena, encourage observation, and stimulate critical thinking. These improvements indicate that the revision process enhanced not only the aesthetic quality of the media but also its functional role as a valid and reliable digital assessment tool. Thus, Table 17 confirms that expert-based revisions significantly contributed to improving the effectiveness and feasibility of the developed digital assessment media.

Table 17
Product Revisions Before and After Development

No.	Before	After
1.		
2.		
3.		
4.		
5.		

Source: Personal Document

Discussion

The development of digital assessment media is driven by the demand for educational digitalization which states that the use of information technology is a necessity to increase the effectiveness of students' learning processes (Potocan & Nedelko, 2025) (Kusumandari et al., 2025). Assessment is an important component of learning because it determines the achievement of learning objectives (Tabinska, 2025) (Hrdinová, 2025) (Bellido-García et al., 2025). Digital assessments are a solution to transform education more broadly and have been proven to have a positive impact on students' learning motivation, especially when combined with self-worth and responsibility. In addition to increasing motivation, the use of technology-based media is also beneficial for students to improve their digital literacy competencies.

The findings of this study indicate that the development of digital assessment media using the Proprofs platform is not only feasible but also effective in addressing evaluation challenges in IPAS learning at the Madrasah Ibtidaiyah level. The validation results from media experts, material experts, and learning evaluation experts demonstrate that the developed assessment media meets pedagogical, technical, and content standards, indicating its suitability for classroom implementation

Revisions carried out based on expert input significantly improved the clarity of instructions, visual presentation, and alignment between assessment items and learning objectives, thereby enhancing usability for students. Furthermore, the trial results with students show that digital-based assessments foster higher engagement and motivation compared to conventional paper-based tests. Students were more actively involved in the evaluation process, as interactive quizzes encouraged participation, immediate feedback, and self-reflection on learning outcomes. These findings reinforce the notion that digital assessment can function not merely as a measurement tool but also as a learning medium that supports the development of science literacy, critical thinking, and responsibility in learning.

In the context of IPAS learning, which integrates scientific concepts requiring observation, reasoning, and analysis, the use of Proprofs-based assessments provides meaningful learning experiences that go beyond rote memorization. Therefore, this study confirms that integrating digital assessment media in primary education, particularly in Madrasah Ibtidaiyah, can bridge the gap between digital learning demands and existing

evaluation practices, while simultaneously improving learning quality and student outcomes.

Digitalization in education not only transforms learning delivery but also fundamentally changes how evaluation is conducted, shifting assessment from a static measurement tool into a dynamic process that can promote feedback, engagement, and self-regulated learning. However, although the adoption of digital learning platforms has rapidly increased, media acquisition specifically for digital-based assessment in primary schools particularly Madrasah Ibtidaiyah has remained limited, as most schools continue to rely on conventional paper-based tests (PBT) despite the shift toward digital learning environments. This indicates a gap between the demands of educational digitalization and the availability of appropriate evaluation media.

However, the reality of the field shows that science subjects are often considered difficult by students. At MI Al-Hidayah, the evaluation process is still dominated by traditional/conventional methods (PBT), which has implications for low learning outcomes and lack of student motivation. In fact, IPAS materials that contain science in them are very important for students because in this era students are required to have strong science competencies. Science literacy is the ability to collect, analyze, and infer information logically and critically in the context of science (Yuliawati et al., 2024). Therefore, the choice of Proprofs as an online *platform* that provides interactive quizzes greatly supports science literacy and can replace conventional memorization methods with game-based activities is very relevant to efforts to realize modern learning.

The media that has been developed undergoes a product feasibility analysis based on expert validators. The following are the results of expert validation confirming the technical and conceptual feasibility of the product: The expert validation results demonstrate strong feasibility in the use of Proprofs-based assessment media. The material expert awarded the highest score, 95% (Very Appropriate), indicating that the Plant material content aligns well with curriculum standards and learning evaluation objectives. Similarly, the media expert provided a score of 92.5% (Very Appropriate), with particularly high ratings in the Display (94%) and Navigation (93%) categories, reinforcing the capability of Proprofs to deliver engaging, interactive learning experiences that effectively integrate text, images, and other media elements. Meanwhile, the learning evaluation expert awarded an overall score of 73% (Appropriate) and provided

constructive recommendations to strengthen the assessment structure, specifically suggesting that quiz questions be presented progressively from easy to difficult and incorporate the 5W + 1H format. This guidance aims to enhance the assessment's ability to measure student skills more accurately and encourage deeper analytical thinking. The product was subsequently revised based on these recommendations to improve its evaluative quality and functionality.

The products that have been validated by expert validators are then tested in small groups, namely on 41 students, and produce a very high percentage of eligibility, which is 94% (Very Feasible). The aspects that showed the most significant impact were Motivation (98%) and Usefulness (98%). The high percentage of motivation proves the success of using Proprofs in livening up the atmosphere in the classroom and providing a more interesting learning dimension, as well as overcoming the problem of low initial student motivation. These results are consistent with other studies that state that the use of Proprofs as an assessment medium can improve student learning outcomes and motivation (Prastyo et al., 2024) (Nasution et al., 2023) (Byhar et al., 2023). Thus, Proprofs-based IPAS assessment media has proven to be effective as a feasible and functional media to support learning evaluation and improve learning outcomes of fourth grade students of MI Al Hidayah Lajukidul.

Overall, the findings of this study provide strong empirical support for the claim that Proprofs-based digital assessment media is both feasible and effective in enhancing student motivation and supporting learning evaluation in IPAS subjects at the Madrasah Ibtidaiyah level. This claim is reinforced by the convergence of expert validation results, high student response scores, and observable improvements in engagement and perceived learning usefulness after product implementation. The consistently high feasibility ratings from material experts, media experts, and student trials confirm that the developed media meets instructional, technical, and pedagogical standards. At the same time, this research contributes to the growing body of knowledge on digital assessment in basic education by demonstrating how interactive, game-based assessment can function not only as a measurement tool but also as a motivational learning instrument. Nevertheless, the study is limited by its single-school context, reliance on descriptive analysis, and the absence of comparative or experimental outcome measures, which restrict broader generalization. These limitations open opportunities for future research to conduct multi-site

implementations, integrate experimental designs to measure learning gains more rigorously, and further refine theoretical frameworks linking digital assessment, student motivation, and character development in Islamic basic education.

Conclusion

This development research succeeded in producing an assessment media for the subject of IPAS Plant material for grade IV MI/SD based on the Proprofs Quiz Maker digital application, which was developed through the simplified R&D model of Borg and Gall. The product was designed as a solution to the low motivation of students in conventional IPAS evaluation. Based on the results of the feasibility test, this media was declared Feasible and Very Appropriate for classroom use. Through a systematic testing process involving expert validation, small group trials, and operational field testing with 82 students, the media consistently achieved high feasibility scores across multiple dimensions. Expert validation results confirmed that the media met curriculum standards, technical design requirements, and evaluation principles, while student trials revealed very high levels of motivation, usability, and perceived learning support. These testing outcomes indicate that the Proprofs-based assessment media functions effectively not only as a digital evaluation tool but also as a medium that enhances student engagement during the assessment process.

Therefore, the results of this testing phase affirm that Proprofs-based digital assessment can be reliably implemented in IPAS learning at Madrasah Ibtidaiyah as a valid alternative to conventional paper-based tests, while also providing a foundation for further large-scale testing and theoretical development in digital assessment for basic education.The consistency between expert validation results and student response data provides strong empirical assurance of the validity of this media as a feasible and beneficial assessment tool, supported by converging evidence across evaluative stakeholders and the complete dataset collected.

Theoretically, this research contributes to the development of basic learning evaluation theory by demonstrating that the integration of digital assessment tools can strengthen student engagement and enhance cognitive learning outcomes in elementary education settings. This finding reinforces the theoretical assumption that interactive technology-based assessment can support constructivist learning principles through

increased autonomy, motivation, and meaningful learning experiences. Practically, the developed media provides teachers with an efficient, scalable, and modern alternative to conventional assessment methods, thereby supporting the implementation of digital-based evaluation in Madrasah Ibtidaiyah.

However, this study still has several limitations that must be acknowledged, particularly related to technical constraints such as the limited availability of supporting tools (software and hardware) and the need to further enhance the creativity and gamification aspects of the media display. Future development should focus on improving the interface design, optimizing interactive features, and conducting broader field trials, specifically the operational testing stage of the Borg and Gall model to strengthen generalizability and measure effectiveness more comprehensively. Further research may also integrate assessment design with values in Islamic basic education, such as responsibility (*amanah*), discipline, and noble character (*akhlakul karimah*), ensuring that digital assessments not only improve academic performance and motivation but also support character-building as a core identity of Madrasah Ibtidaiyah education.

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References

Aarnio, H., Kangas, K., Clavert, M., & Toom, A. (2025). Collaborative assessment in design-based technology education. *International Journal of Child-Computer Interaction*, *46*(July), 100779. https://doi.org/10.1016/j.ijcci.2025.100779

Agustina, R. L., Rafiah, H., & Maulana, F. (2025). Kesulitan Belajar Siswa SD Berdasarkan Indikator Watson Pada Pembelajaran IPAS Di Kurikulum Merdeka. *JUPEIS : Jurnal Pendidikan Dan Ilmu Sosial*, *4*(2), 69–74. https://doi.org/10.57218/jupeis.vol4.iss2.1526

Aini, N. I. (2024). Analisis Faktor-faktor Kesulitan Belajar IPAS pada Peserta Didik Kelas V Sekolah Dasar. *Didaktik : Jurnal Ilmiah PGSD FKIP Universitas Mandir*, *4*(1), 9–15.

Amalia, A. D., & Wirawati, D. (2023). Pemanfaatan Teknologi Digital dalam Pembelajaran Bahasa Indonesia. *Alinea: Jurnal Bahasa, Sastra, Dan Pengajaran*, *12*(2), 220. https://doi.org/10.35194/alinea.v12i2.2418

Arafani, W. (2024). Using Gamifikasi Through ProProfs in Learning: A Systematic Literature Review. *Indonesian Journal of STEM Education*, *6*(2), 86–101.

Asmara, L., Anshori, A., & Shohib, M. W. (2025). Integrating Digital Assessment in Islamic Education within the Merdeka Curriculum : A Study Case at SMP Negeri 2 Ngemplak. *Journal of Proceedings Series: The 3rd International Conference of Islamic Education*, *3*(3), 106–114.

Assegaf, A. R., Khaulasari, H., Thohir, M., Ali, A., & Pangastuti, R. (2025). The Effectiveness of Peaceful Education Learning Strategies for Students at Emergency Madrasas Following Natural Disasters in Sidoarjo. *Jurnal Pendidikan Agama Islam*, *22*(1), 57–80. https://doi.org/10.14421/jpai.v22i1.8369

Aulia, M., A, J. S., Helmia, I., Siswoyo, A. A., & Madura, U. T. (2025). Penerapan Asesmen Autentik Berbasis Tertulis untuk Meningkatkan Hasil Belajar Kognitif IPAS Siswa SDN Tagungguh 2. *ACTION : Jurnal Inovasi Penelitian Tindakan Kelas Dan Sekolah*, *5*(2), 230–240.

Baghit, R., Laaboudi, D., Erguig, R., & Jadida, E. (2024). A Study of the Impact of Online Feedback on Moroccan EFL University Students' Listening Proficiency. *Arab World English Journal (AWEJ)*, *15*(4), 150–167.

Bankole, H. B., & Ayanwale, M. A. (2025). Digital assessments boost science attitudes

and sustainable education. *Discover Sustainability*, *6*(1). https://doi.org/10.1007/s43621-025-01963-7

Bellido-García, R., Lozano-Gonzales, B., Cruzata-Martínez, A., Rodríguez-Huamán, M., & Rejas-Borjas, G. (2025). Formative assessment and its contribution to the improvement of reading comprehension in a public school in Lima. *European Public & Social Innovation Review*, *11*, 1–18. https://doi.org/10.31637/epsir-2026-1956

Boedi Maritasari, D., & Lailani, A. (2025). Development of Tests Based on Proprofs Digital Media to Measure Higher Order Thinking Skills (HOTS) of Students in Science Learning. *Jurnal Penelitian Pendidikan IPA*, *11*(1), 71–77. https://doi.org/10.29303/jppipa.v11i1.9383

Byhar, H., Pits, I., Shevchuk, K., Prokop, I., Shestobuz, O., & Dariichuk, S. (2023). The impact of gamification on the motivation of primary schoolers under martial law. *Revista Amazonia Investiga*, *12*(61), 317–329. https://doi.org/10.34069/ai/2023.61.01.32

David, L., & Weinstein, N. (2024). Using technology to make learning fun : technology use is best made fun and challenging to optimize intrinsic motivation and engagement. *European Journal of Psychology of Education*, *39*(2), 1441–1463. https://doi.org/10.1007/s10212-023-00734-0

Fadilla, A. R., Suhardi, & Sudiati. (2023). Implementasi Penilaian Autentik Bahasa Indonesia Bermuatan Literasi Digital-Industri di SMK dalam Paradigma Kebijakan Edukasi 5.0. *Jurnal Nuansa Akademik*, *8*(2), 277–298.

Fayrus, & Slamet, A. (2022). *Model Penelitian Pengembangan (R n D)*.

Garcia, M. B. (2025). Self-Coded Digital Portfolios as an Authentic Project-Based Learning Assessment in Computing Education: Evidence from a Web Design and Development Course. *Education Sciences*, *15*(9), 1–18. https://doi.org/10.3390/educsci15091150

Hardiansyah, F., Misbahudholam Ar, M., & Hidayatillah, Y. (2022). Learning Assessment To Measure Science Process Skill In Elementary School. *International Journal of Elementary Education*, *6*(3), 612–623. https://doi.org/10.23887/ijee.v6i4.54217

Hemminki-Reijonen, U., Hassan, N. M. A. M., Huotilainen, M., Koivisto, J. M., & Cowley, B. U. (2025). Design of generative AI-powered pedagogy for virtual reality environments in higher education. *Npj Science of Learning*, *10*(1). https://doi.org/10.1038/s41539-025-00326-1

Hidayati Rofiah, N., Sinta, T. N. A., & Dewi, R. (2024). Development of Articulate Storyline Media for Enhancing Learning Outcomes in Natural and Social Sciences Among Elementary School Students. *Al-Bidayah : Jurnal Pendidikan Dasar Islam*, *16*(1), 19–40. https://doi.org/10.14421/al-bidayah.v16i1.9559

Hrdinová, N. (2025). Barriers to Digitalization in a Preschool Institution. *Journal of Educational and Social Research*, *15*(4), 1–11. https://doi.org/10.36941/jesr-2025-0117

Jurāne-Brēmane, A. (2023). Digital Assessment in Technology-Enriched Education: Thematic Review. *Education Sciences*, *13*(5). https://doi.org/10.3390/educsci13050522

Kusumandari, R. B., BS, T. H., & Martitah. (2025). Enhancing Critical Thinking and Student Independence through Interactive Math Media: An Articulate Storyline-Based Study in Indonesian Elementary Education Rafika. *Journal of Educational and Social Research*, *15*(5), 312–325.

Mardiana, R., Ramdini, D. S. A., Putri, F. D., Nurdin, M., Zhahra, R. A., Annisa, S. N., & Setianingsih, Y. (2021). Developing Online Assessment for Junior High School Students Using Proprofs During the Covid19 Pandemic. *Jurnal Fascho: Kajian Pendidikan Dan Sosial Kemasyarakatan*, *11*(1), 1–09. https://doi.org/10.54626/fascho.v11i1.77

Minta, R., Pasaribu, I., Tanjung, S., Medan, U. N., & Medan, K. (2025). Developing interactive SAC-based media to enhance elementary IPAS learning. *Inovasi Kurikulum*, *22*(4), 2115–2132.

Nasution, K., Ulfah, M., Ali, S., Ahmad, H., & Padangsidimpuan, A. (2023). Utilization of the Proprofs Brain Games Website as an Online-Based Learning Media. *ICETAR THE 1 St INTERNATIONAL CONFERENCE ON EDUCATIONAL THEORIES*, 162–173.

Novita Irawati, T., & Al Ayubi, S. (2024). Pengaruh Media Proprofs Terhadap Hasil Belajar matematika Siswa SMP. *Jurnal Indopedia (Inovasi Pembelajaran Dan Pendidikan)*, *2*(1), 106–114.

Ober, J., Matusevych, T., & Strutynska, O. (2025). From challenges to opportunities: Using ICT and AI in Ukrainian education in times of pandemic and War. *Journal of Open Innovation: Technology, Market, and Complexity*, *11*(4). https://doi.org/10.1016/j.joitmc.2025.100639

Orim, F. S., Ofem, U. J., Edam-Agbor, I. B., Nsan, N. N., Okri, J. A., Ekpang, P., Ogunjimi, B., Egbe, I. M., Ukatu, J. O., Angrey, C. U., Undie, M. A., Akin-Fakorede, O., Abua, D., & Asukwo, P. (2025). Implementation of automated classroom assessment in higher education using the technology acceptance model. *Discover Education*, *4*(1). https://doi.org/10.1007/s44217-025-00481-y

Potocan, V., & Nedelko, Z. (2025). Digitalization of Higher Education : Students ' Perspectives. *Education Sciences*, 1–20.

Prastyo, N. T. L., Solihin, A., Suhartono, S., Subrata, H., & Daoyi, Z. (2024). Enhancing Digital Literacy in Eighth-Grade Students through AI-Integrated ProProfs.com and Differentiated Instruction. *Educative: Jurnal Ilmiah Pendidikan*, *2*(3), 160–

168. https://doi.org/10.70437/educative.v2i3.726

Rahman, N. F., Masdar, M. I., Ilmiani, A. M., Habibie, F., & Samdouni, S. (2022). Transformation of Arabic Assessment in Indonesia: Conventional Assessment Toward Digital Assessment. *Al-Ta'rib : Jurnal Ilmiah Program Studi Pendidikan Bahasa Arab IAIN Palangka Raya*, *10*(2), 199–212. https://doi.org/10.23971/altarib.v10i2.4510

Ratna Widya Wijayanti, Yatim Riyanto, & Waspodo Tjipto Subroto. (2023). Pengembangan Instrumen Penilaian Digital Untuk Mengukur Hasil Belajar IPS Kelas IV Sekolah Dasar. *EDUKASIA: Jurnal Pendidikan Dan Pembelajaran*, *4*(1), 127–136. https://doi.org/10.62775/edukasia.v4i1.230

Safish, I., Yunus, M., Zaki, A., Ahadin, & Hasniyati. (2025). Development of Ubiquitous Project-Based Learning (U-Pjbl) Model to Improve Critical Thinking Skills of Elementary School Students. *Journal of Learning for Development*, *12*(2), 313–329. https://doi.org/10.56059/jl4d.v12i2.1358

Sannuri. (2022). Pengembangan Media Pembelajaran Game Edukasi Berbasis Komputer Pada Mata Pelajaran Ekonomi Kelas X Ma Mambaul Ulum Desa Bira Timur Kecamatan Sokobanah Kabupaten Sampang. *Tata Arta*.

Sapta, A., & Nisa, U. K. (2024). the Use of Formative Evaluation in the Development of Spatial Buildings for Elementary School Students Based on Augmented Reality. *Al-Bidayah : Jurnal Pendidikan Dasar Islam*, *16*(1), 151–172. https://doi.org/10.14421/al-bidayah.v16i1.9583

Sarip, M., Linty, M., Kurniadi, P., Erliana, L., & Xavier, E. (2024). Development of the ProProfs platform as an E-Quiz for Arabic Language Learning in Early Childhood Education. *Journal International of Lingua and Technology*, *3*(1), 146–162. https://doi.org/10.55849/jiltech.v3i1.574

Shahzad, M. F., Xu, S., Hanif, S., & Akram, S. (2025). What factors affect the intention to use information and communication technology? Perspectives of Chinese university students. *Humanities and Social Sciences Communications*, *12*(1), 1–14. https://doi.org/10.1057/s41599-025-05156-5

Sinaga, C. P., Silalahi, V. M., & Silaban, W. (2025). Pengembangan Media Pembelajaran Teka-Teki Silang Pada Website Proprofs untuk Meningkatkan Hasil Belajar Siswa Materi Ekosistem Kelas VII UPTD SMP Negeri 1 Pematangsiantar. *INNOCATIVE: Journal Of Social Science Research*, *5*(1), 1513–1526.

Siyam, Y., Siyam, N., Hussain, M., & Alqaryouti, O. (2025). Evaluating technology integration in education: a framework for professional development. *Discover Education*, *4*(1). https://doi.org/10.1007/s44217-025-00448-z

Suhelayanti, Amna Emda, Misbahul Jannah, Wati Oviana, Ridha Ilahi, & Rizki Julia Utama. (2024). Pemanfaatan AI dalam Pembuatan Media dan Asessment Pembelajaran IPAS. *Bansigom: Jurnal Kolaboratif Akademika*, *1*(1), 1–7.

https://doi.org/10.26811/jka.1.2.00012

Suwandi, S. (2022). Analisis Data Research dan Development Pendidikan Islam. *Journal of Islamic Education El Madani*, *1*(1), 1–13. https://doi.org/10.55438/jiee.v1i1.11

Swistiyawati, N. L. P., & Indrayani, I. A. M. (2024). Analisis Siswa dalam Memahami Konsep IPAS Di Kelas II SD No.5 Taman. *Dharma Education Journal*, *5*(2), 1316–7732. http://ejournal.undhari.ac.id/index.php/de_journal

Tabinska, O. (2025). Interactive learning in the digital age: Advancing STEM skills in primary school education through robotics. *Periodicals of Engineering and Natural Sciences*, *13*(3), 671–680. https://doi.org/10.21533/pen.v13.i3.450

Tok, Y., & Ünal, M. (2020). Examining the correlation between resilience levels and math and science process skills of 5-year-old preschoolers. *Research in Pedagogy*, *10*(2), 203–228. https://doi.org/10.5937/istrped2002203t

van den Berg, L. (2025). Re-thinking invigilation implementation: a mixed method approach to student perceptions and system usability for digital assessment adoption. *International Journal for Educational Integrity*, *21*(1). https://doi.org/10.1007/s40979-025-00183-w

Virdania, S., Afidah, N., Nur, L. C. N., Ma'arif, I. B., & Francisca, D. (2024). Developing Online Assessment Instrument by Using Proprofs Website for Assessing English Reading Competence. *APPLICATION: Applied Science in Learning Research*, *4*(2), 60–65. https://doi.org/10.32764/application.v4i2.5210

Yuliawati, F., Sulistyowati, E., Ekantini, A., & Wijayanti, I. D. (2024). Increasing Students' Scientific Literacy Competence Through A Stem-Based PjBL Learning Model: A Case Study of an Ecosystem Project. *Jurnal Penelitian Pendidikan IPA*, *10*(12), 10538–10546. https://doi.org/10.29303/jppipa.v10i11.6874