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Development of Non-Cognitive Diagnostic Assessment based on Google Sites in Chemistry Learning for Students

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Abstract
This study aims to measure the level of validity and response of educators and students to non-cognitive diagnostic assessments based on google sites in chemistry learning. This study's methodology is Research and Development (R&D) based on the ADDIE paradigm. Literature reviews, interviews, observations, and tests (validity instrument and response questionnaire) were used to gather data. The non-cognitive diagnostic test used in this study was based on google sites which was tested on 3 chemistry educators, 8 students of MA Al-Anwar Pontianak on a small scale, and 27 students of MA Islamiyah Pontianak on a large scale. The developed media was tested for validity in the aspects of assessment, media, and language by 5 assessment experts, 2 media experts, and 2 language experts respectively. The validity test results showed the percentage of feasibility in the assessment aspect was CVI 1.00, media 97%, and language 94%. The average percentage of chemistry educators responses to the developed media was 96% with a very good category, while the average percentage of students responses in the small-scale trial was 88% and the students response test in the large-scale trial was 87%. Thus, the non-cognitive diagnostic assessment based on google sites has a very valid validity category and a very good response so that it can be used to measure interest in learning chemistry.

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INTRODUCTION

The Ministry of Education, Culture, Research, and Technology, led by Nadiem Makarim, introduced a new policy known as the Merdeka curriculum. This policy aims to provide students with the freedom to learn independently so they may become self-sufficient learners and be better prepared to tackle contemporary issues in the future (Hartono, 2023). The Merdeka curriculum consists of inclusive learning, intracurricular activities, projects to strengthen the Pancasila learner profile, and extracurricular activities. Inclusive learning is defined as a learning approach that accommodates student diversity, including differences in ethnicity, religion, culture, and prior knowledge. To implement inclusive learning effectively, educators need to conduct assessments to understand students initial conditions and identities before starting the teaching and learning process (Purnawanto, 2022).

One essential component of assessment in the Merdeka curriculum is diagnostic assessment, which is divided into cognitive and non-cognitive assessments. Cognitive diagnostic assessments measure students achievements and competencies, while non-cognitive diagnostic assessments evaluate aspects related to personality, emotions, and behavior. One example of non-cognitive diagnostic assessment is the measurement of students interest in learning (Supriyadi et al., 2022). Aligning these assessments with learner-centered learning enables

educators to gain a deeper understanding of students interests and individual needs, thus facilitating the development of personalized learning strategies (Hairida et al., 2024).

Students interest in learning plays a crucial role in education, as high interest fosters engagement and comprehension of subject matter (Fathin & Safiah, 2024). By identifying students interests, educators can adjust and design differentiated learning activities to enhance students understanding (Maut, 2022). However, the implementation of non-cognitive diagnostic assessments in many schools remains conventional, often conducted orally or in written form (Supriyadi et al., 2022). Written assessments present several challenges, including human errors, unclear statements, lack of student engagement, time-consuming scoring, and ineffective supervision (Washburn et al., 2017). Moreover, checking and providing feedback manually requires considerable effort from educators. Studies have shown that many educators lack an understanding of diagnostic assessments; for instance, research in elementary schools in the Tanjung sub-district revealed that 40.91% of educators were unfamiliar with diagnostic assessments, and 5 out of 22 interviewed educators had never heard of the term (Laulita et al., 2022). Additionally, some educators at MTS As'adiyah Uloe believe that non-cognitive diagnostic assessments are unnecessary, as students have already undergone interviews during the registration process (Syafi'i, 2023).

A preliminary study conducted on December 18, 2024, at MA Al-Anwar Pontianak revealed that the Merdeka curriculum was implemented for class X students in the 2024/2025 academic year. Non-cognitive diagnostic assessments, particularly those measuring students interest in learning, were conducted orally by educators. This method was chosen due to the lack of training on assessment techniques, resulting in limited skills in preparing instruments and following up on assessments. Research has highlighted various obstacles faced by teachers in implementing assessments, including time constraints, limited techniques, lack of diverse instruments, and underutilization of technology (Serani & Hairida, 2024). Developing non-cognitive diagnostic assessments is challenging because educators must align them with the specific learning needs of their students (Iskak et al., 2023). Although MA Al-Anwar Pontianak has adequate computer and internet facilities, and students use Android phones, educators have never implemented technology-based non-cognitive assessments due to time constraints and the limited duration of class hours. Meanwhile, the Merdeka curriculum emphasizes the need for educators to digitize learning and integrate technology to enhance educational quality (Nikma & Rozak, 2023).

In response to these challenges, technology offers a practical and efficient solution to facilitate learning and assessment. The education system must adapt to digital transformation to maintain the relevance and effectiveness of learning (Rosmana et al., 2023). In this context, non-cognitive diagnostic assessments at MA Al-Anwar Pontianak can be improved through technology-based solutions such as websites. A systematic and structured digital assessment platform would enable all educators to access and utilize student data for designing engaging learning experiences, ultimately leading to improved learning outcomes (Husna et al., 2024). Research has shown that technology-based assessments help educators streamline their work, providing a more varied and efficient approach that reduces the time and effort needed for implementation and data management (Aji et al., 2020; Rakhmi et al., 2023). Additionally, effective digital media utilization is essential to optimize data processing and analysis, as accurate data is crucial for comprehensive assessment and evaluation (Rakhmi et al., 2023).

Web-based media is one of the most effective and accessible digital tools for education. Among the various platforms available, Google Sites offers a practical solution for creating assessment websites. Google Sites is an interconnected platform that integrates seamlessly with other Google services such as Google Docs, Google Forms, Google Drive, and YouTube, allowing users to easily access and manage content (Salsabila & Aslam, 2022). Compared to learning

management systems (LMS), which often require extensive setup and maintenance, Google Sites provides a simpler, more flexible, and cost-effective alternative. A study on the use of Google Sites as a learning tool at SMKN 2 Payakumbuh found that it was considered easy and practical by educators, with an average satisfaction score of 91.10% (Saputra & Effendi, 2021).

Based on the literature and preliminary observations, this research aims to develop a Google Sites based non-cognitive diagnostic assessment for chemistry learning in grade X students. This study seeks to create a functional and efficient assessment tool that educators can use to accurately and comprehensively measure students interest in learning. By integrating technology into the assessment process, this research is expected to contribute to the improvement of digital-based assessment methods in line with the goals of the Merdeka curriculum.

METHOD

The type of research used in this study is research and development known as research and development (R&D) which was developed using the ADDIE development model. The ADDIE development model is a research approach that analyzes the interaction and coordination between components in each phase (Sezer et al, 2013) in Rayanto (2020). Analysis, design, development, implementation, and evaluation are the five stages that make up the phase in question. However, in this study, it was only carried out until the development stage because it could shorten the time needed so that it was optimal in product manufacturing, product validation, and product testing. This is especially important when the research focuses on developing assessment tools or learning products that often only require feedback for improvement (Molenda, 2003).

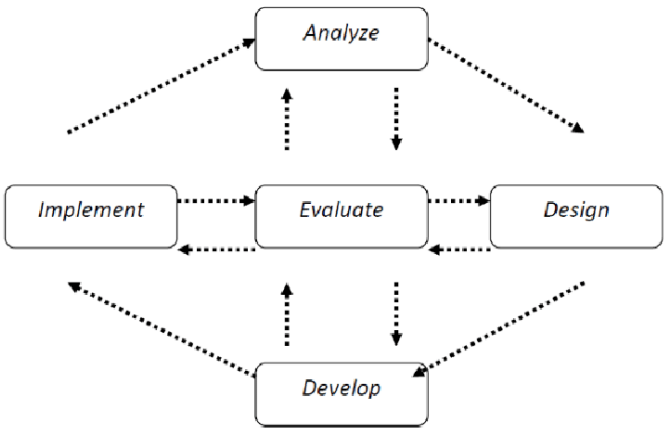

Figure 1. Schematic of the ADDIE development model (Source: Anglada, 2007)

The subject of this research is a non-cognitive diagnostic assessment based on google sites to measure students interest in learning chemistry. The product was tested on 3 chemistry educators, 8 students of MA Al-Anwar Pontianak on a small scale, and 27 students of MA Islamiyah Pontianak on a large scale. The validators of this study consisted of 5 assessment experts, 2 media experts, and 2 language experts.

The analysis stage in this research begins by analyzing the needs that occur in the field by observing the school so as to get the results that become the basis for consideration for the design stage. Then proceed with the design stage of the interest instrument, validation, response questionnaire and storyboard of the product made in the form of google sites. Then proceed with the development stage, namely making google sites products that have been designed and

then validated through validation tests to see validity. The validation results will also be used to review and revise the developed product.

The results of the research instrument validation were first validated by 2 validators. Scoring on the instrument validation sheet refers to the Gregory test which consists of scores 1-2 (not relevant) and 3-4 (relevant). The assessment made by two experts using the Gregory test is based on a 2x2 cross tabulation consisting of four columns: A, B, C, and D. The Gregory index can be seen as presented in Table 1.

Table 1. Contigency to calculate the Gregory index

		Validator 1	
		Not Relevant Score (1-2)	Relevant Score (3-4)
Validator 2	Not Relevant Score (1-2)	(A)	(B)
	Relevant Score (3-4)	(C)	(D)

(Gregory, 2015)

Description:
A = Both validators disagree (1-2)
B = Validator 1 agrees (3-4), validator 2 disagrees (1-2)
C = Validator 1 disagrees (1-2), validator 2 agrees (3-4)
D = Both validators agree (3-4)

Then, the coeeficient of content validity of the instrumen is calculated using Gregory's formula as follows:

$$\text{Content validity coefficient} = \frac{D}{(A+B+C+D)}$$

If the results have been obtained, the validity criteria of the research instrument can be seen in Table 2.

Table 2. Gregory's validity percentage criteria

Index	**Criteria**
0,00 – 0,19	Very Low
0,20 – 0,39	Low
0,40 – 0,59	Medium
0,6 – 0,79	High
0,8 – 1	Very High

(Meivinia et al, 2023)

Next, when the results of the validation of research instruments have been obtained, it is continued with assessment validation, media validation, and language validation. In the assessment validation, there are 4 aspects and 7 indicators measured, namely aspects of feelings of pleasure, interest, attention, and involvement as well as indicators of emotional conditions during learning, student enthusiasm, educator performance, question processing, student focus, student activeness, and student effort which includes 25 positive statements in total. Lawshe (1975) developed the Content Validity Ratio (CVR) and Content Validity Index (CVI) methods to analyze the irrelevant and relevant categories used in assessing the assessment validation sheet in this study. The CVR calculation is based on the following formula:

$$\text{CVR} = \frac{ne - \frac{N}{2}}{\frac{N}{2}}$$

Description:
CVR = Content Validity Ratio
ne = Number of validators who gave relevant ratings
N = Number of validators

After obtaining the CVR value, the Content Validity Index (CVI) value is then calculated to illustrate that all instrument items have good content validity. The CVI formula is as follows:

$$\text{CVI} = \frac{\sum CVR}{\sum n}$$

Description:
CVI = Content Validity Index
ΣCVR = Sum of CVR scores
Σn = Number of items in all aspects
The conclusions obtained based on the minimum value of Lawshe's (1975) index are:

1. If the CVI value ≥ 0.99 then the assessment is declared valid
2. If the CVI value < 0.99 then the assessment is declared invalid

Table 3. CVR minimum standard

Number of Validators	Minimum Value
5	0,99
6	0,99
7	0,99
8	0,75
9	0,78
10	0,62

Adapted from Bashooir & Supahar (2018)

Media validation has 2 aspects and 8 indicators measured, namely display and software aspects and indicators of size standards, layout, attractiveness, instructions for use, suitability, ease of operation, ease of access, and navigation buttons which include 8 statements in total. While in language validation there are only 3 aspects measured in each assessment statement, namely the suitability of the statement with good and correct Indonesian language, the language used in the statement is straightforward, and the effectiveness of the sentences used. In addition to validation by validators, the product was also carried out a response test involving three chemistry educators, 8 students of class X MA Al-Anwar Pontianak on a small scale, and 27 students of class X MA Islamiyah Pontianak on a large scale. Assessment of media validation sheets, language validation, and response tests refers to a Likert scale adapted from Sugiyono (2016) with an assessment score of 1 to 4 points, namely 4 = strongly agree (SS), 3 = Agree (S), 2 = Disagree (TS), 1 = Strongly Disagree (STS). The results of the assessment of validators and respondents in the form of comments and suggestions will be used as evaluation material for improving the products developed. Data in the form of numbers from the assessment results from validators and respondents will be analyzed using a formula adapted from Akbar (2013) as follows:

$$V - ah = \frac{TSe}{TSh}\ X\ 100\%$$

Description :
V-ah : Expert Validity
TSe : Total validator empirical score
TSh : Maximum score

The percentage results obtained from media and language validators can be seen in Table 4.

Table 4. Validity percentage criteria

Achievement Criteria	Validity Level	Description
85,01-100%	Very Valid	Can be used without improvement
70,01-85,00%	Quite Valid	Usable with minor revisions
50,01-70,00%	Less Valid	Recommended not to be used because it needs major revision
01,00-50,00%	Invalid	May not be used

(Akbar, 2013)

The percentage results obtained from educator and student respondents can be seen in the validity criteria in Table 5.

Table 5. Response test percentage criteria

Percentage	Category
0% - 20%	Not Good
21% - 40%	Less Good
41% - 60%	Good Enough
61% - 80%	Good
81% - 100%	Very Good

(Riduwan, 2016)

RESULTS AND DISCUSSION

The result of this research is a product in the realm of education, namely the development of non-cognitive diagnostic assessments based on Google Sites. This media has a number of advantages compared to other digital assessments. Google Sites makes it easy for educators to manage assessment results (Lutfiah, 2023), and allows access through various devices and technologies (Sari et al., 2022). In addition, this platform also excels in terms of format flexibility, as it supports the integration of various media such as images, videos, and animations (Suryantari & Mulyono, 2023). However, the use of Google Sites has limitations, it can only be accessed when connected to the internet and must be integrated with Google services. Despite the limitations, Google Sites is still worth using in the development of non-cognitive diagnostic assessments because its advantages are that it can optimally support the research objectives and does not reduce the quality of the research process carried out. After all the data was collected, the data was analyzed and described in depth. The results of the process can be explained as follows:

Analysis Stage

The analysis stage is the initial stage to identify various problems and gaps in the learning process (Hidayat, 2021). This stage is focused on analyzing the needs that occur in the field, especially related to the use of learning media in chemistry subjects at school and examining non-cognitive diagnostic assessments that are applied in supporting students understanding and development. The needs analysis was carried out by means of observation to MA Al-Anwar Pontianak school, direct interviews with chemistry educators, and literature studies relevant to the research problem. The results of direct interviews with MA Al-Anwar Pontianak chemistry educators found that the measurement of non-cognitive diagnostic assessments, especially learning interest, has never been carried out by educators in writing or digitally, this is because educators have never been involved in training on more detailed assessments so they do not know how to prepare the instrument. In addition, educators have limited time to implement assessments through a media or application.

Design Stage

The design stage in this study includes designing products in the form of storyboards, making non-cognitive diagnostic assessment statements, making research instruments in the form of validation instruments and product response tests which will be validated first by two validators. The purpose of validating research instruments is to ensure that the research instruments made are accurate and able to measure aspects of product feasibility in terms of assessment, media, and language. At this stage, the design for the tools that will be available and used in the product is also made using the Canva application. In addition, the collection of references related to information from non-cognitive diagnostic assessments ranging from principles, differences, objectives, and benefits was also carried out at this stage.

Development Stage

The third stage in this research is the development stage, this stage focuses on producing and validating the developed product. At this stage the storyboard design will be realized into a development product which is then validated to determine its validity level. The appearance and content of diagnostic assessment development products based on google sites can be seen at the following link: https://bit.ly/diagnosite

The process of instrument validation in research aims to ensure that the instrument is both appropriate and feasible in measuring the intended elements (Ernawati & Sukardiyono, 2017). This validation process is essential to guarantee the accuracy and reliability of the instrument before it is implemented in the study. To determine the validity of the instrument, assessments from expert validators were analyzed using the Gregory formula. Based on the calculations, all instruments utilized in this study including assessment validation instruments, media evaluation, language evaluation, as well as educator and student response questionnaires achieved a content validity coefficient of 1, which falls into the very high category. Retnawati (2016) states that if the content validity coefficient > 0.8, it is classified as having high validity. Therefore, instruments that meet these validity criteria can be considered appropriate for further use in the research process.

After validating the research instrument using the Gregory formula, the product was then validated by a total of nine experts consisting of: 5 assessment experts, 2 media experts, and 2 language experts with the aim of knowing the level of feasibility of non-cognitive diagnostic assessment products based on Google sites.In the assessment feasibility test, it was validated using the Content Validity Index by 5 experts consisting of 1 lecturer and 4 driving teachers. The results of the assessment validation by 5 experts can be seen in Table 6.

Table 6. Assessment validation results by 5 validators

Aspect	Indicator	Number of Validators Rating Relevant	Number of Validators Rating Not Relevant	CVR	Category
Feelings of Pleasure	Emotional state when learning	5	0	1.00	Very Valid
Interest	Students enthusiasm	5	0	1.00	Very Valid
	Educator performance	5	0	1.00	Very Valid
	Question Working	5	0	1.00	Very Valid
Attention	Students focus	5	0	1.00	Very Valid
Engagement	Students activeness	5	0	1.00	Very Valid
	Student effort	5	0	1.00	Very Valid
CVI				1.00	Very Valid

Based on Table 6, the analysis results show CVR results with an average = 1.00 or declared very valid and suitable for use in research. All aspects of the assessment have been assessed accordingly by the five validators. In the aspect of feeling happy obtained a CVI value = 1.00 with a very valid category. This shows that the aspect of feeling happy can assess emotional conditions during learning. Thus, the feeling of pleasure in students can be shown by their emotional condition which can affect learning motivation so that it can affect the learning outcomes of these students (Wulandari, 2021). The interest aspect obtained a CVI value = 1.00 with a very valid category. This shows that this aspect can assess students enthusiasm, educator performance, and question processing. Based on the results of Martho's research (2024), it is stated that interest in learning is strongly related to the level of enthusiasm of students, this is because the higher the level of interest of students in learning, the greater their enthusiasm in participating in learning activities.

Interest in relevant learning approaches can increase enthusiasm for students (Listiani, 2023) so this interest affects the performance of educators in teaching by giving educators positive feedback that can improve the quality of teaching (Nuriansari, 2018). Thus, the relationship between these two things implicitly has a major effect on the motivation of students to work on problems. Learners who are interested in learning tend to work on questions more seriously and focus (Oktavia et al., 2024). The attention aspect obtained a CVI value = 1.00 with a very valid category. This shows that this aspect can assess the focus of students. Thus the importance of the attention aspect is key in an effective learning process. Through the aspect of attention, educators can assess the level of focus and perseverance of students in learning, which in turn can contribute positively to their academic performance (Winata, 2021).

The engagement aspect obtained a CVI value = 1.00 with a very valid category. This shows that this aspect can assess students activeness and effort. Thus, students engagement in the learning process is very important to increase their activeness and effort. Students who actively participate in discussions and group activities tend to show a better understanding of the subject matter (Yunitasari & Hardini, 2020). Assessments that meet the eligibility criteria must be aligned with the aspects and indicators of the statement. Based on research, there is a close relationship between aspects, indicators, and statements, where aspects and indicators act as guidelines in developing appropriate assessment instruments. Therefore, the suitability between the two is needed so that the instrument used is relevant and effective. The selection of appropriate assessment instruments will support the optimal achievement of learner competencies (Indaryanti, 2018) in (Dewi NT et al, 2023).

In the media feasibility test, validation was carried out by 2 experts from 1 teacher of SMAN 3 Pontianak and 1 person from Simpang Mandiri Institute. The media feasibility test consists of display and software aspects. After the calculation, the average validity of the media based on the two aspects of the assessment was 97% which was included in the very valid category. The average results of the media validation assessment can be seen in Figure 2.

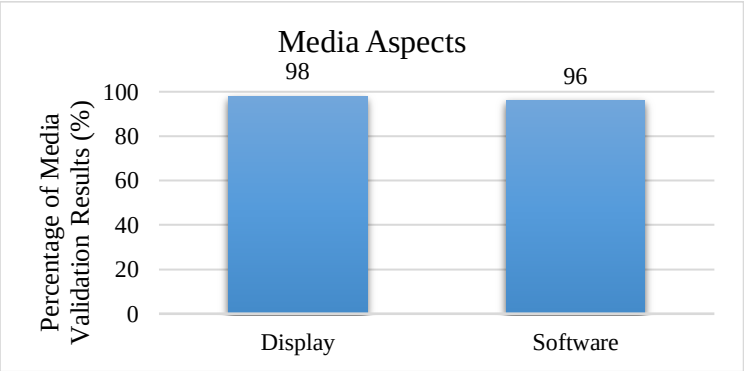

Figure 2. Average percentage of media validation results (N=2)

Based on Figure 2, the display aspect of media validity gets the highest percentage value compared to the software aspect. The percentage of display aspects obtained is 98% and is included in the very valid category. This high percentage indicates that the media developed has met the standard criteria for a good appearance in terms of size, aesthetics, layout, attractiveness, and suitability of the design to the desired objectives. An attractive and intuitive display can increase user attractiveness so that it can be used effectively as a learning interest measurement tool. With an attractive appearance and by user expectations, the media can be useful for seeing objects more clearly, interactively, easily understood, and increasing the level of thinking (Hulu DM et al, 2022). Furthermore, the software aspect of media validity gets a percentage of 96% which is included in the very valid category. The percentage shows that the developed media has met the standard software criteria in terms of function, stability, convenience, and compatibility with various devices. This indicates that the software can operate properly without experiencing technical problems that hinder users so that it can be used with frequent intensity and support more interactive learning. With stable and easy-to-use software, it can increase learner engagement and make it easier for them to participate in learning activities (Safitri & Puspasari, 2022).

Therefore, the media developed has met the eligibility criteria and can be used in the learning process or accordance with the desired objectives. The high average validity indicates that the media has been well designed in terms of content, appearance, navigation buttons, and convenience. However, there are two things that received suggestions from one of the validators, namely related to the selection and layout in the display aspect and the menu button in the software aspect. This is because the illustration on the media title is too small and the "home" menu button does not react when clicked so the validator suggested increasing the size of the illustration and moving the home menu while in another menu. However, suggestions and comments related to the "home" button cannot be implemented due to the limitations of the google sites template itself. The suggestions and improvements implemented are presented in Table 7.

Table 7. Media improvement results based on validator comments and suggestion

Before Revision	After Revision
 The size of the illustration of 4 children studying has a small size	 The size of the illustration of 4 children studying has been enlarged

Furthermore, the language feasibility test was validated by 2 experts from Indonesian Language Education lecturers at PGRI Pontianak University. The language feasibility test consists of aspects of language suitability, language straightforwardness, and language effectiveness which aims to assess the feasibility of language in 25 assessment statements that have been made and validated. After the calculation, the average validity of the three aspects of the assessment is

94% which is included in the very valid category. The average results of the language validation assessment can be seen in Figure 3.

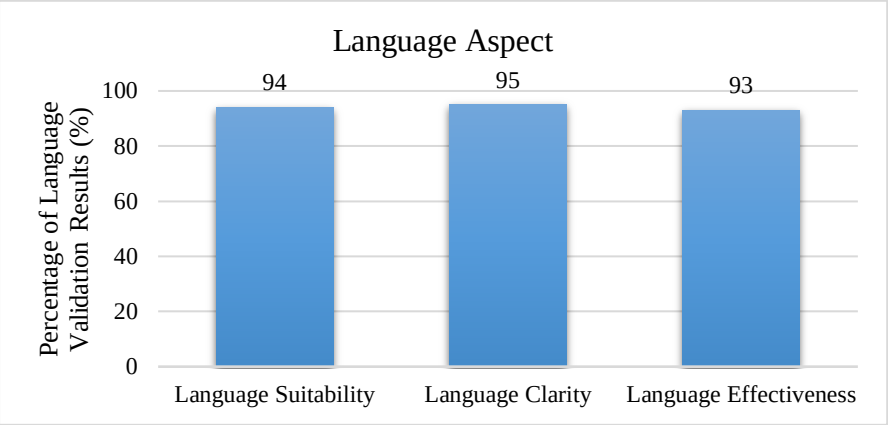

Figure 3. Average percentage of validation results

Based on Figure 3, the language suitability aspect of the language validity gets a percentage of 94% which is included in the very valid category. Thus, it can be stated that the use of language in each statement in the assessment is in accordance with good and correct Indonesian. The percentage shows that the language used in the assessment statement as a whole is in accordance with the standards of grammar, spelling, and proper sentence structure. The use of language in learning assessment has a crucial role because it affects students' understanding. The use of language that is communicative, clear, and easy to understand can minimize the possibility of misunderstanding. With a high level of validity from the accuracy of the ba, the assessment can be relied upon as an objective measurement and evaluation tool. Language is something that is used to build interactions between educators and students, language must be mastered as the main means in learning activities (Nurjaman et al., 2024).

The aspect of language clarity in language validity gets the highest percentage value compared to aspects of language suitability and language effectiveness. Thus, the use of language in each statement in the assessment is stated to be straightforward. The high percentage shows that the language used in the assessment statement has met good language standards including clarity, readability, and accuracy. Language clarity is important in the preparation of assessments because it affects learners' understanding of the content and instructions of the statement. Straightforward, unambiguous, and uncomplicated language helps learners to understand statements more easily and increases time efficiency during the assessment process so that it can measure learners' interest in learning objectively. Learning that uses straightforward language tends to be more interactive and dialogic, learners are more involved in the learning process where learners feel comfortable asking questions and discuss (Agustina & Okmarisa, 2023).

The aspect of language effectiveness in the validity of language gets a percentage of 93% which is included in the very valid category. The percentage shows that the language used in the assessment has met the effectiveness criteria, which is able to convey messages clearly and according to purpose. The use of effective language in the assessment is very important because it aims to make students understand and respond to information more quickly. Thus, the assessments made are not only feasible to use but also able to accurately measure learners' competencies. One approach to strengthening learners' character is to integrate learning by using effective and efficient language. Through the use of language, moral and character values can be modeled by learners (Sayogha & Rahmaputri, 2023). There are several suggestions and comments from validators on the three aspects of language including; 1) correcting writing errors, 2) paying attention to the use of capital letters in words, and 3) correcting sentences that

are less effective and not straightforward. The results of suggestions and improvements can be seen in Table 8.

Table 8. Results of language improvements based on comments and suggestions from language validators

Before Revision	After Revision
"Saya semangat ketika sedang belajar kimia"	"Saya semangat ketika sedang belajar Kimia"
"Saya memiliki motivasi yang tinggi dalam mempelajarai kimia"	"Saya memiliki motivasi tinggi dalam mempelajari Kimia"
"Saya menyukai pembelajaran kimia jika pendidik menggunakan media pembelajaran"	"Saya menyukai pembelajaran Kimia jika pendidik menggunakan media pembelajaran yang menarik"
"Saya menyukai pembalajaran kimia jika pendidik menggunakan metode belajar yang bervariasi seperti diskusi kelompok dan lainnya"	"Saya menyukai pembelajaran Kimia jika pendidik menggunakan metode belajar yang inovatif"
"Saya menyukai tahapan belajar yang dilakukan oleh pendidik karena membuat pembelajaran kimia menjadi lebih mengasyiikan"	"Saya menyukai tahapan belajar yang dilakukan oleh pendidik karena membuat pembelajaran Kimia menjadi lebih menarik"
"Saya merasa puas ketika dapat menjawab soal yang diberikan oleh pendidik dengan benar"	"Saya merasa puas ketika dapat menjawab soal dengan benar"
"Saya belajar kimia dengan tekun agar dapat memahami materi"	"Saya belajar Kimia dengan tekun agar dapat memahami materi yang disampaikan pendidik"

**Note : the "underlined" words are words that are changed, added, or omitted.*

After validation by experts, the next step taken at this stage is the response test. The response test involved 3 chemistry educators, 8 students of MA Al-Anwar Pontianak as a small scale, 27 students of MA Islamiyah Pontianak as a large scale. The average results of educators' responses are presented in Figure 4.

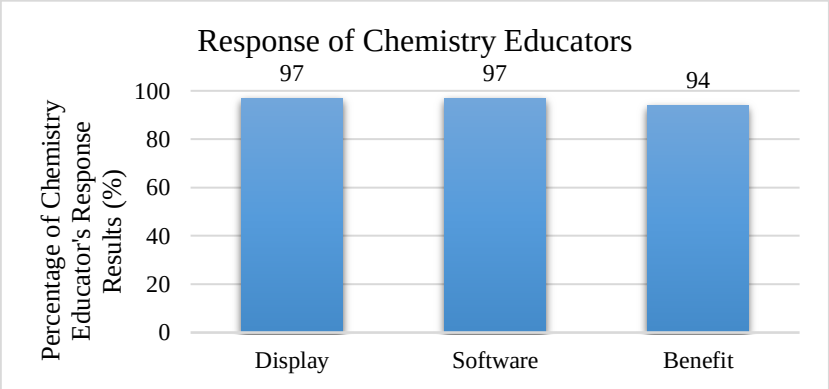

Figure 4. Percentage of average results of chemistry educator response (N=3)

Based on Figure 4, the average response from educators on the three aspects assessed reached 96%, placing it in the excellent category. In particular, the display aspect and software aspect obtained the highest average percentage response of 97% and fell into the excellent category. This shows that the appearance, design, and layout of the media have met good visual standards so that they can be used for effective learning. An attractive and well-structured display plays an important role in increasing learner engagement, as it can help them understand the information more clearly and comfortably. In addition, a neat layout, appropriate color selection, and the use of icons and supporting images can be major factors in enhancing the attractiveness of a medium. Success in the learning process can be achieved optimally if students experience an interesting and enjoyable learning atmosphere during learning activities

(Utami, 2017). Therefore, this media is very feasible to use to support the learning process, one of which is identifying student learning interests. The software aspect obtained an average response percentage of 97% and was included in the excellent category, the percentage was identical to the results in the display aspect which also obtained an average value of 97%. This shows that the software on this media has good access speed and fast data processing without experiencing technical problems that hinder the learning process. Ease of navigation also increases comfort in using the available features. With a high level of validity, this media is very feasible to be used as a digital-based learning tool so as to increase the effectiveness of the learning process. Ease of access to a media or application can affect the efficiency of learning in the digital era that allows learners to learn anytime and anywhere. Such flexibility is important to accommodate various learning needs (Andriani & Prabowo, 2021). Thus, this media becomes one of the effective and interactive educational technology alternatives.

The benefits aspect on average produced a very good response with a percentage of 94%. This shows that the media developed is able to provide benefits to educators where the media can facilitate the design of learning, shorten the time for providing feedback, accurately identify the needs of students, and make it possible to make students more interactive in the application of media because there are various interactive elements and features on Google sites. Interactive media is very influential in learning, because it can help teachers in designing learning so that it is easier to convey material and create a more dynamic and enjoyable learning atmosphere for students (Indartiwi et al., 2020). Thus, the media has great potential in achieving more practical learning objectives. However, there was a comment from one of the educators who became a respondent, the educator said that the media developed was good, it just needed to think about solutions if there were problems with the signal and connection.

In addition to the response test to chemistry educators, the response test was also conducted to students through a small-scale trial consisting of 8 students of class X MA Al-Anwar Pontianak and a large-scale trial consisting of 27 students of class X MA Islamiyah Pontianak. The average results of students responses on a small scale can be seen in Figure 5.

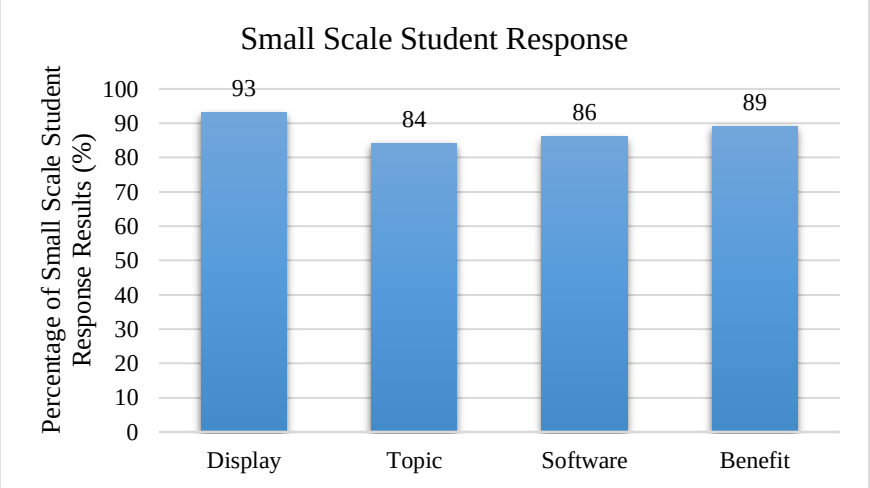

Figure 5. Percentage of the average results of small scale student responses (N=8)

Based on Figure 5, the average response from small-scale learners across the four assessed aspects reached 88%, placing it in the very good category. Specifically, the display aspect received an average rating of 93%, indicating a very good response category. This shows that a good and attractive appearance not only affects the aesthetics of the media, but also acts as a facility for students to improve their proficiency in using technology in learning. In the material aspect, the average result is 84% with a very good response category. This indicates that the information presented in the media is clear, easily comprehensible, and appropriately aligned

with the student's level of understanding. In the software aspect, the average result is 86% with a very good response category. This shows that the accessibility of the media is practical to use as long as it is connected to the internet. In the benefits aspect, the average result is 89% with a very good response category. This shows that students can access information and materials more freely and can find out the results of assessment tests more quickly and easily used.

Furthermore, the large-scale response test of 27 students of class X MA Islamiyah Pontianak was carried out if they had conducted a small-scale response test. The average results of students responses on a large scale can be seen in Figure 6.

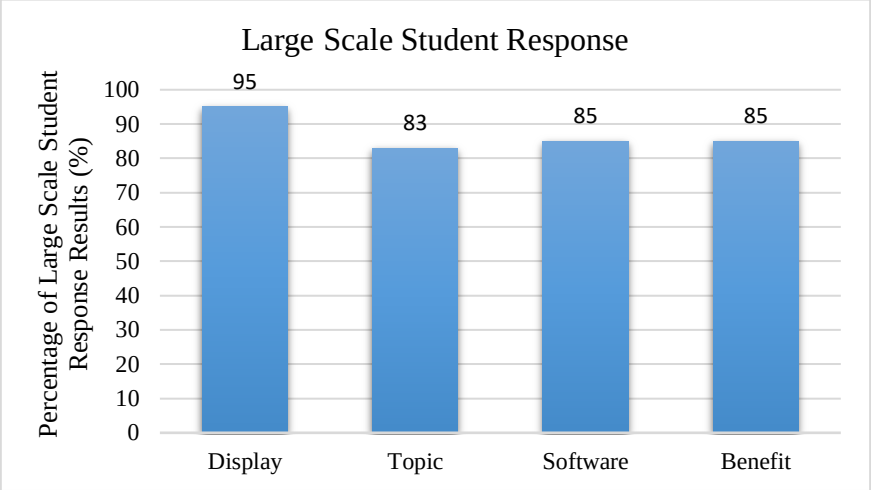

Figure 6. Percentage of the average results of large scale student responses (N=27)

Based on Figure 6, the average large-scale learner response from all aspects of the assessment of the results obtained is not much different from the small-scale response test, which is 87% with a very good response category. The display aspect in the large-scale learner response test received the highest percentage value compared to the other three aspects. The percentage of display aspects obtained was 95% and included in the very valid category. This high percentage shows that students feel a structured and clear visualization that provides a satisfying experience in using the media. The percentage of display aspects in small and large scale response tests indicates that using media with clear and structured visualizations can be an effective strategy to increase student interest and interest in learning (Saputra et al., 2024). The material aspect obtained an average result of 83% with a very good response category. According to Sastro et al. (2023), the percentage of material aspects in small and large scale response tests shows that the use of interactive learning materials benefits students by increasing engagement and conceptual understanding.

The software aspect obtained an average result of 85% with a very good response category. This result shows that the media can be operated consistently through various devices so that the available features can be maximally utilized. The percentage of software aspects in small and large scale response tests shows that applications that can be reached flexibly from various devices can save time and can ensure users experience uniform functionality (García, J., & Calatrava, A., 2024). The benefits aspect obtained an average result of 85% with a very good response category. These results indicate that the media developed can help them identify their interest in learning, especially in learning chemistry so that they can explore the advantages possessed by students. The percentage of benefit aspects in the small and large scale response tests indicates that educators need to understand the potential of each learner to design learning that can stimulate motivation and knowledge exploration. Thus, students can be more motivated to improve their academic performance for better achievement (Kholis, 2019).

CONCLUSION

Based on the results of the research and development that has been carried out, it can be concluded that the google sites based non-cognitive diagnostic assessment effectively helps educators identify students interests and learning needs more quickly and accurately. In addition, this assessment facilitates learning planning for educators, while students get a more efficient assessment process and faster feedback. Thus, this product can be categorized as highly valid. The validity test results showed that the assessment aspect obtained a CVR score of 1.00, with media validity of 97% and language validity of 94%. The average response of educators to the Google Sites-based diagnostic assessment developed reached 96% with a very good category. Meanwhile, the average student response on the small-scale test was 88% and on the large-scale test was 87%, both also categorized as very good. These results indicate that the assessment tool was well received by both educators and students. However, this study has some limitations such as being conducted in a limited sample size, so the results may not be fully generalizable to various other educational contexts. In addition, although this assessment is effective in identifying students interest in learning chemistry, further research is needed to explore its long-term impact on students engagement and learning outcomes.

RECOMMENDATIONS

Based on the description above, the recommendations and suggestions that can be made are to expand the scope of the population and samples by involving students from various levels of education, subjects, and more diverse school backgrounds. In addition, future research is recommended to use a longitudinal approach to evaluate the impact of the assessment on students motivation, academic engagement and learning outcomes in the long term. In terms of technology, this assessment can be optimized by integrating the latest technological developments to be more adaptive to students' individual characteristics and able to provide more personalized and predictive feedback. Furthermore, further research can explore the integration of this assessment with differentiative pedagogical approaches so that the assessment not only functions as an evaluation tool but also as a pedagogical instrument that supports more effective and engaging learning. With more holistic and comprehensive approaches, further research is expected to be able to refine digital based non-cognitive diagnostic assessments and contribute to educational technology innovations that are more personalized, effective, and oriented to the needs of learners.

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