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Research Article

Development Innovative e-Module Based on Project Based Learning (PJBL) Integrated Betel Eating Local Wishdom (Man Belo or Marsukil) From North Sumatera on Teaching Stoichiometric Chemistry by Using Anyflip

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ABSTRACT

The implementation of learning integrated with local wisdom culture based on projects, which is the goal of the independent curriculum, is a promising learning innovation, however, research on its implementation in the classroom to foster skills and goals of the independent curriculum is still lacking. This study uses a descriptive quantitative method to assess the module based on the criteria in the BSNP assessment, including content feasibility, language feasibility, presentation feasibility, and graphic feasibility. Through the 4D stage method, an innovative learning module based on Project Based Learning (PjBL) integrated with Betel Eating Cultur (Man Belo or Marsukil) from North Sumatra, Indonesia on Stoichiometric material was produced. This study shows that there is interest and attraction in the integration of teaching materials based on Project Based Learning (PjBL) integrated with Betel Eating Cultur (Man Belo or Marsukil), which can foster critical thinking and love of culture for the readiness of the goals of the implemented independent curriculum.

Keywords: Innovatif e-Module, Betel eating, local wishdom, Stoichiometric Chemistry, Project-Based learning

1. INTRODUCTION

Education is an effort made consciously so that students can actively and structurally develop their potential. Education is closely related to learning activities and the learning process at school (Simangunsong & Pane, 2021). Learning can change the behavior and mindset of learners

continuously, functionally, positively, actively, and purposefully to produce a better experience for learners and their application in the real world.

This is in line with Burton's opinion in his book entitled Guidance of Learning Activities that learning is a change in behavior that occurs in each individual due to the interaction between individual and individual and between individual and their environment (Amaliyah & Rahmat, 2021). In improving the quality of learning, educators are expected to pay attention to several factors, such as clear learning objectives, relevant and interesting materials, and appropriate, accurate, and objective learning methods (Faizah & Kamal, 2024).

In education and learning activities, the curriculum is inseparable. The Curriculum is made as a reference in the implementation plan of learning activities. The curriculum has a very broad understanding, ranging from limited efforts to influence students in learning to affect educational facilities and infrastructure (Shofiyah, 2018). The independent curriculum has several characteristics as follows (1) Project-based learning (PjBL) to develop soft skills and character, (2) Focus on essential materials that are expected to provide sufficient time for in-depth learning of basic competencies such as literacy and numeracy, (3) Teachers have the flexibility to conduct learning that is by student abilities (teaching at the right level) and make adjustments to the context and local content (Mulyasa, 2023).

E-modules play a crucial role in modern education by supporting electronic-based learning through structured digital content accessible via mobile phones and laptops (Silaban et al., 2021). They offer financial benefits by eliminating the need for printed materials while enhancing students' comprehension through interactive, efficient, and innovative designs tailored to their needs. Integrating ethnopedagogy and local wisdom into E-modules fosters a deeper, context-based understanding, maximizing learning outcomes. AnyFlip further enhances this approach by transforming static PDFs into dynamic, interactive flipbooks with realistic page-turning effects and multimedia integration. Its seamless sharing across web and mobile platforms makes it a practical tool for educators seeking engaging, technology-driven learning solutions (Permata & Zulherman, 2023).

Stoichiometry in the independent curriculum discusses the basic concepts of chemistry, so this material is important to understand because it will affect the materials afterwards. If the wrong teaching technique by the teacher will cause students difficulty in understanding the material (Hernawan, 2011). The Project-Based Learning (PjBL) Learning Model is an analysis-based learning model that is centered on the concepts and principles of learning materials to produce a complete project work and solve problems related to context (Zhang & Ma, 2023). PjBL, in other words, can direct the learning process of students to be more active and efficient in learning (Nurhidayah et al., 2021). The application of the Project Based Learning (PjBL) learning model in stoichiometric learning can facilitate students ' understanding and help foster students ' interest in learning stoichiometric chemistry.

Based on Government Regulation of Indonesia (PP) Number 4 of 2022 concerning amendments to Government Regulation Number 57 of 2021 concerning national education standards. This regulation strongly emphasizes that education standards must be based on Pancasila, the 1945 Constitution of the Republic of Indonesia, the Unitary State of the Republic of Indonesia, and Bhineka Tunggal Ika, namely regarding the importance of cultural integration in the curriculum (Government Regulation, 2022). This regulation emphasizes that the curriculum must be prepared by taking into account the potential of the region and students, which includes aspects of local culture. On this basis, the independent curriculum strongly supports the application of culture in education because its flexibility allows the integration of local wisdom into the learning process. This is in line with the constructivist theory put forward by Vygotsky, where learning occurs through social interaction and cultural context (Satria et al., 2022). By incorporating elements of local culture, students can build a more contextual and meaningful understanding according to their social environment. The Independent Curriculum also gives teachers and schools the freedom to adjust teaching materials based on local needs and characteristics. This kind of approach makes the education system more

adaptive and responsive to societal developments so that regional cultural values can be integrated into the teaching and learning process.

Betel (Piper Batle) is a plant that thrives in the mountainous region of Bukit Barisan, stretching from North Sumatra province and Aceh province. In the culture of eating betel as local wisdom, betel leaves are mixed with Whiting and areca nuts and then chewed to produce a red liquid that is believed to increase stamina and oral and dental health. In the Tanah Karo province of North Sumatra, most middle-aged women chew betel leaves, Whiting, tobacco, and areca nut, usually called “marsukkil”. Other uses of betel nut culture are also part of tribal rituals in Indonesia. In Papua, betel-eating activities are also often carried out, but what is eaten is not betel leaves but betel flowers. Local wisdom in eating betel can explain acid, alkaline, and salt solutions. Betel leaves are also commonly used as a natural indicator to show the nature of acids and bases with green to red changes in alkaline conditions. The color change may occur in more than one pathway of betel extract pH change in an alkaline environment (Silaban et al., 2024).

Previous research has tested the effectiveness of local wisdom-based learning, which is able to improve learning achievement and love for local culture in the surrounding environment and foster conservation character values (Erfan et al., 2024; Safitri et al., 2018). Other studies have also developed and tested the effectiveness of local wisdom-based modules that improve logic, creative thinking skills, and scientific literacy (Hartini et al., 2017). However, studies specifically discussing the development of modules based on local wisdom on chemicals are still rarely developed, especially on stoikiomteri materials. Therefore, it is important to conduct research on the development of chemistry modules based on local wisdom on stoichiometric materials.

Acknowledging the inevitable influence and benefits of the effectiveness of integrating learning material sources with integrated surrounding culture (Mills et al., 2023), this study aims to develop learning materials through a study of the applicable educational curriculum, regarding its integration into the local wisdom of betel-eating culture by answering the following research questions (RQ):

1. RQ1: What is the availability of module teaching materials that integrate the local wisdom of betel-eating culture?
2. RQ2: What is the level of validity of the module that integrates the local wisdom of betel-eating culture with PjBL?
3. RQ3: How effective is the learning resource module that integrates the local wisdom of betel-eating culture based on PjBL for students?

An E-module is an innovative teaching material that enhances the learning process by integrating information technology. Unlike printed modules, E-modules can be accessed via laptops or mobile phones, both online and offline, making them particularly beneficial for schools with limited internet access (Lastri, 2023).

Beyond accessibility, E-modules foster independent learning, allowing students to track their progress and measure their understanding. By setting clear learning objectives, students can navigate the material efficiently, ensuring they grasp key concepts. According to Daryanto (Lastri, 2023), a well-developed E-module should be self-instructive, comprehensive, stand-alone, adaptive, and user-friendly.

Project-Based Learning (PjBL) refines Problem-Based Learning by emphasizing contextual teaching and learning (CTL). This approach connects educational materials with real-world situations, encouraging students to apply their knowledge in daily life (Zhang & Ma, 2023).

PjBL focuses on problem-solving through hands-on projects, allowing students to engage in meaningful, practical experiences. The learning process involves critical thinking and real-world application. According to Akhyar et al. (2024), the PjBL syntax includes: (1) starting with a driving question, (2) designing a project plan, (3) creating a schedule, (4) monitoring progress, (5) assessing outcomes, and (6) evaluating and reflecting on the experience.

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3. METHODOLOGY

Study context and participants

This study was conducted in a secondary school in Medan, North Sumatra, Indonesia. Although the national curriculum standards emphasize culture-based and project-based learning (Ministry of Education of the Republic of Indonesia, 2022), it is largely underrepresented in the classroom. Instead, the classroom is dominated by traditional literacy instruction that is specific, print-based, lecture-based, and less interesting to students. In addition, the school does not offer any form of independent curriculum education and training according to its provisions, such as workshops or optional courses. Most students in this school find it difficult to undergo the independent curriculum, and the implementation of learning models is less varied. This study involved one class of 33 11th-grade students. These students were selected as recommendations from teachers at the school.

Research process

The 4 stages have a 4D model, namely:

1. Define stage, aims to identify facts or requirements in learning.
2. The design stage is the design process of a product that has been determined. This stage aims to prepare a draft or prototype of a product that is being developed.
3. The development stage consists of several steps, namely design validation and design revision of the product being developed.
4. The final stage is the distribution of the product that has been developed.

This study uses development research steps with a 4D model, which is carried out only until the trial asks for student responses to the E-module that has been developed.

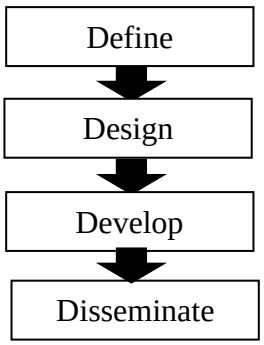

Figure 1 Development 4D Model Stage

Data collection and analysis

This research employs four data collection methods: observation to analyze learning needs, literature studies to examine syllabi and teaching materials, questionnaires to assess module accuracy and appeal, and validation sheets evaluated by experts using BSNP criteria. Data analysis is conducted qualitatively and descriptively in two stages: module evaluation by validators and analysis of teacher and student responses.

4. RESULT

Define Stage

The define stage aims to establish facts and define the requirements needed in making teaching materials. In the initial analysis, the teacher stated that the models used in learning were Problem Based Learning and Iquiri only. The demands for the integration of the independent curriculum based on Government Regulation (PP) No. 4 of 2022 that education standards must be based on Pancasila, the 1945 Constitution of the Republic of Indonesia, the Unitary State of the Republic of Indonesia and Bhineka Tunggal Ika, namely regarding the importance of cultural integration in the curriculum. Curriculum analysis is carried out to determine a directed, systematic, and consistent design. The

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analysis is used as a reference in the design and development of E-modules based on PjBL integrated with ethnopedagogy on stoichiometry material in high school.

Researchers conduct material analysis that is in accordance with the topic of the problem so that the material can be rearranged systematically. Researchers conducted this material analysis on several books with different authors. The selection of this book is based on the use of chemistry books at SMA N 5, starting from the KTSP curriculum, the K13 curriculum, and the independent curriculum. The three books analyzed for the content requirements of the E-learning module design are listed in Table 1.

Table 1
List of books analyzed

	Author	Publisher	Publication Year
Chemistry Book for High School (SMA/MA)	Munasprianto Ramli, dkk	Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi	2022
Chemistry for Senior High School Grade XI	Unggul Sudarmo	**Erlangga**	2021
Chemistry Teacher's Guide	Munasprianto Ramli, dkk	Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi	2022

The aspects analyzed from the three books are the contents of the book, sub-topics, and assessment according to BSNP. The aspects assessed based on the criteria in the BSNP assessment include the appropriateness of the content, the appropriateness of the language, the appropriateness of the presentation, and the appropriateness of the graphics. Based on the results of the book analysis, the percentage of each aspect is calculated according to the BSNP criteria. The analysis of the calculation of the assessment of chemistry books by the researcher can be seen in Appendix 4. The results of the analysis of the three books can be seen in detail in Table 2.

Table 2
Aspects of book assessment analyzed

No	Assessment Aspects	Average Percentage (%)
1	Content suitability	89
2	Presentation suitability	92
3	Graphics	96
4	Language	91
	Average	92
	Category	Very worthy

Based on table 2, it can be seen that the three chemistry books (on stoichiometry material) analyzed by researchers in terms of content, presentation, graphics, and language feasibility are by the feasibility aspects of BSNP. The results of the assessment of content feasibility, language feasibility, presentation feasibility, and graphic feasibility of the three chemistry books gave different results. However, these three books are not books in the form of modules designed based on project-based learning integrated with local wisdom of betel-eating culture in them. For this reason, this study was designed to produce an E-module based on PjBL integrated with the ethnopedagogy of betel-eating culture and spiritual values in stoichiometry chemistry material by the feasibility aspects of BSNP. The book analysis graph can be seen in Figure 2.

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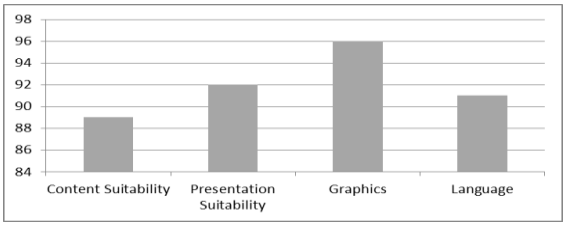
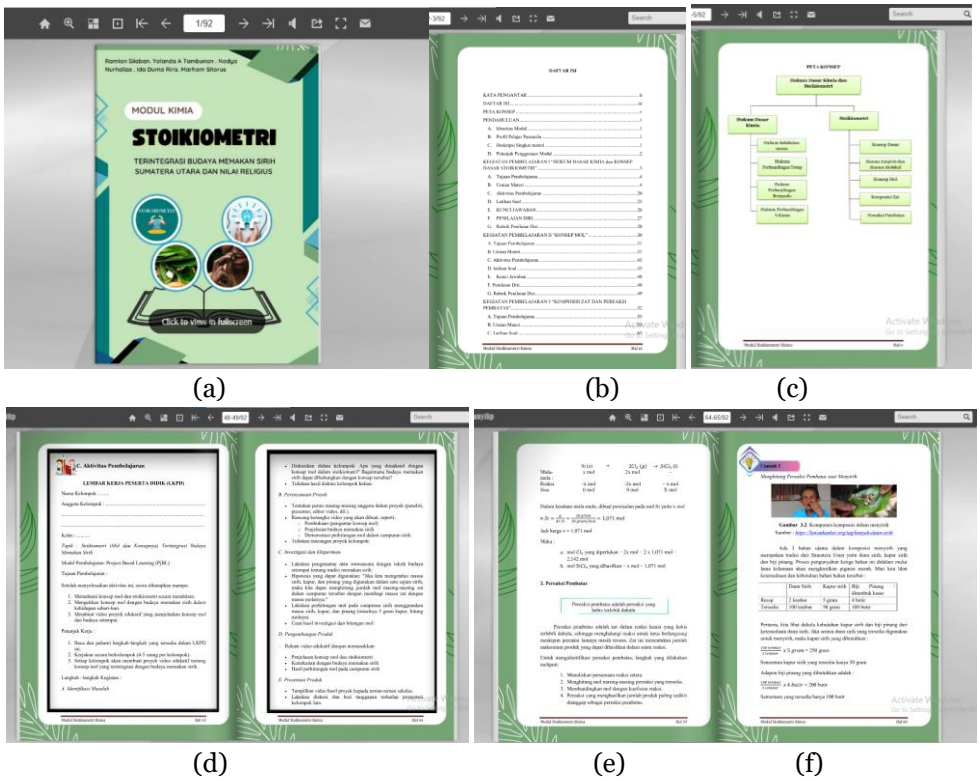


Figure 2 Development 4D Model Stage

Design Stage

This stage aims to prepare guidelines/foundations in compiling the E-module as a whole. Compiling this E-module requires several applications, namely Microsoft Word and the Anyflip platform. The Microsoft Word application is used to create the content and design of the e-module, then the e-module is converted to PDF and published using the Anyflip platform application. The Anyflip platform has several components, such as themes, templates, and visuals.

The creation of this E-module is designed using components that are equipped with an initial section, including a foreword, table of contents, concept map, introduction in the form of module identity, Pancasila student profile, brief description of the material, and instructions for using the module. The core part of the module consists of the presentation of learning activity I material, namely the basic laws of chemistry and the basic concept of stoichiometry; learning activity II material, namely the concept of moles; and learning activity III, namely the composition of substances and limiting reagents. Each learning activity is equipped with learning objectives, material descriptions, learning activities, practice questions, answer keys, self-assessment, and individual assessment rubrics. This module is designed to be integrated with ethnopedagogy in the form of betel-eating culture and spiritual values; therefore, in the description of the material of this module, the reader is given an understanding of the concepts of betel-eating towards the concept of stoichiometry as well as the spiritual value of stoichiometry material. Furthermore, at the end of the designed module, there is an evaluation, answer key, glossary, summary, and bibliography as a closing.



(a) (b) (c)

(d) (e) (f)

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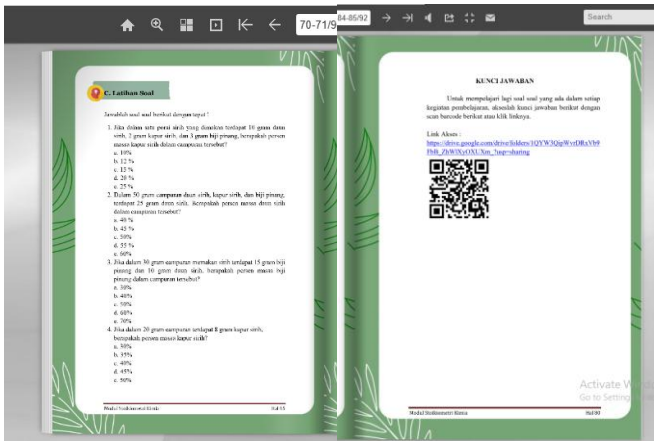

(g) (h)

Figure 3 Development 4D Model Stage (a) cover (b) table of contents (c) mind map (d) part of learning activity of module (PjBL) (e) example question (f) integration material with eating batel (g) evaluation (h) key answer

Develop Stage

At the development stage, the researcher perfected the draft of the E-module based on PjBL integrated with the ethnopedagogy of betel-eating culture and spiritual values in the stoichiometry material. Furthermore, the module that has been designed and created is perfected by being validated by expert media and material experts with BNSP assessment criteria. The results of the development stage are described as follows. Expert validation aims to determine the feasibility of the e-module based on PjBL integrated with the ethnopedagogy of betel-eating culture and spiritual values in the subject of stoichiometry chemistry.

Validation of material experts

Validation of the material was carried out by 3 expert validators consisting of 2 chemistry lecturers from Unimed and 1 chemistry teacher from SMA Negeri 5 Medan. The assessment of the validation instrument was used based on the BSNP criteria from several aspects, namely the aspect of content feasibility, the aspect of presentation feasibility, and the aspect of language feasibility. The assessment of the validation instrument used a Likert scale calculation with a score range per item of 1-5. The assessment of the validation results by the expert validator of the e-module based on PjBL integrated with the ethnopedagogy of betel-eating culture and spiritual values can be seen in Table 3.

Table 3
Results of the Validation Assessment of Material in the E-module

No	Assessment Components	Persentase Penilaian			Rata-Rata (%)
		D1	D2	G1	
1	Content feasibility	89,2%	95,3%	93,8%	92,82
2	Contextual assessment	93,3%	91,1%	91,1%	91,85
3	Presentation feasibility	98%	98%	96%	97,3
Overall average (%)					93,99
Validation Criteria Analysis Percentage					Worthy

Information:
D1: Validator lecturer 1
D2: Validator lecturer 2
G1: Validator teacher

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Based on Table 3, the average percentage assessment by the expert validator of the material on the aspect of content feasibility obtained a result of 92.82%, on the aspect of contextual feasibility obtained a result of 91.85%, and on the aspect of presentation feasibility obtained a result of 97.3%. The overall average result obtained from each aspect of the material assessment was 93.99%. Based on the average percentage, the material in the integrated PjBL module of the ethnopedagogy of betel-eating culture and spiritual values on the topic of stoichiometric chemistry obtained the criteria of "suitable" for use.

Validation of media experts

Media validation was conducted by 3 expert validators consisting of 2 chemistry lecturers at Unimed and 1 chemistry teacher at SMA Negeri 5 Medan. The media expert validation assessment used an assessment based on BSNP criteria from several aspects, namely the graphic feasibility aspect and the language feasibility aspect. Media expert validation used a Likert scale calculation with a score range per item of 1-5. This assessment can be seen in Appendix 5. The assessment results from the media expert validator in the E-module based on PjBL integrated ethnopedagogy of betel leaf culture and spiritual values on the topic of stoichiometric chemistry can be seen in Table 4.

Table 4
Media Validation Assessment Results on E-modules

No	Assessment component	Assessment persentage			Average (%)
		D1	D2	G1	
1	Graphic feasibility	88%	89%	92%	90,1
2	Language feasibility	85%	86%	86%	86,1
Overall average (%)					88,1
Validation criteria analysis percentage					Worthy

D1: Lecturer 1
D2: Lecturer 2
G1: Teacher 1

Based on Table 4, the results obtained were 90.1% in the graphic feasibility aspect, and the results obtained in the language feasibility aspect were 86.1%. The results of the average overall value of both aspects were 88.1%. This shows that the E-module based on PjBL integrated with the ethnopedagogy of betel-eating culture and spiritual values on the topic of stoichiometric chemistry is included in the criteria of "feasible" for use.

Disseminate Stage

After the validation and revision stages were carried out according to the suggestions for improvement by the expert validator, it was continued to the trial stage for students who had studied stoichiometry material. This trial was carried out by distributing modules and assessment questionnaires to 33 students. The researcher also asked for responses in the form of questionnaires to 2 teachers at SMA Negeri 5 Medan, namely Chemistry teachers and Biology teachers.

Questionnaire Analysis by Students

In the trial stage, a student response questionnaire sheet was given to 33 students at SMA Negeri 5 Medan. This trial aims to determine the feasibility of the module content through the assessment of student responses to the E-module as the subject of use. The assessment of student responses using BSNP criteria includes several aspects, namely, aspects of interest, aspects of material, and aspects of language.

Tabel 5
Analysis of student responses to E-modules

	Assessment aspect	Percentage of assessment
1	Interesting aspect	84,09
2	Material aspect	85,9

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3	Language aspect	85,03

Average	85,06
Questionnaire percentage interpretation	Very high
Module criteria	Very Interesting

Based on the results of table 5. obtained a value of 84.09% in the aspect of interest, 85.9% in the aspect of material, and 85.06% in the aspect of language. Overall, a value of 85.06% was obtained for all aspects of the assessment with the criteria of "very high," and the module criteria were classified as very interesting. A positive response was obtained to the E-module; students felt satisfied in exploring and reading the concept of stoichiometry material.

Questionnaire Analysis by Teachers

The questionnaire by the teacher was conducted to provide an assessment of the developed module as well as to distribute the module to teachers as a reference for teaching materials. The results of the questionnaire analysis by the teacher can be seen in Table 6.

Tabel 6
Analisis respon guru terhadap E-Modul

	Assessment aspect	Percentage of assessment
1	Content Feasibility Aspect	84,375
2	Language Feasibility Aspect	78,571
3	Presentation Feasibility Aspect	83,33
Average		82,5
Questionnaire percentage interpretation		Very high
Module criteria		Very Interesting

Based on the results of table 6 obtained a value of 84.375% in the aspect of content feasibility, 78.57% in the aspect of language feasibility and 83.33% in the aspect of presentation feasibility. Overall, a value of 82.5% was obtained for all aspects of the assessment with the criteria of "very high," and the module criteria were classified as very interesting. A positive response was obtained to the E-module; teachers felt satisfied in exploring and reading the concept of stoichiometry material.

5. DISCUSSION

This study resulted in the development of an E-module titled "Innovative Development of E-Module Teaching Material Based on Project-Based Learning (PjBL) Integrated with Ethnopedagogy on Stoichiometric Chemistry Material." The development followed the 4D model, consisting of four stages: define, design, develop, and disseminate. In the define stage, an initial needs analysis, ATP analysis, and material analysis were conducted.

The E-module was designed to align with the independent curriculum, which emphasizes cultural integration in education, as mandated by Government Regulation No. 4 of 2022. Mulyasa (2023) also highlights that one of the key characteristics of this curriculum is implementing the PjBL model to develop students' competencies, faith, and moral values. Observations at SMA N 5 Medan revealed that culturally integrated PjBL learning was either absent or rarely implemented due to limited materials. This finding underscored the need to develop an innovative E-module that incorporates both PjBL and ethnopedagogy, specifically integrating betel-chewing culture and spiritual values into stoichiometric chemistry.

One of the key advantages of this E-module is its accessibility—it can be used anytime and anywhere with electronic devices such as smartphones or laptops. Furthermore, it serves as an

interactive and innovative learning resource, promoting independent study. During the *design* stage, the module was structured with essential components, including user guides, concept maps, project-based learning activities, evaluations, and references. The module was then formatted and published on the *Anyflip* platform to enhance accessibility and engagement.

In the *development* stage, the module underwent validation by two expert lecturers and chemistry teachers at SMA N 5 Medan. Their feedback and constructive suggestions were used to refine the module according to the national education standards set by BNSP. Once it was deemed suitable, the module proceeded to the *dissemination* stage. It was uploaded to *Anyflip* and distributed to chemistry teachers as well as other subject teachers, including biology educators. Additionally, 33 students from class XI-9, who had previously studied stoichiometry, were asked to evaluate the module through a questionnaire. The responses were overwhelmingly positive, confirming the module's effectiveness as a learning resource.

Evaluation results showed that the material feasibility scored 93.99%, while the media feasibility was rated at 88.1%. Student responses indicated an 85.06% approval rating, classifying the module as "highly engaging." Many students found it more enjoyable and unique compared to traditional textbooks, as it successfully linked chemistry concepts with cultural and spiritual values, making the material easier to understand at first glance.

This research aligns with previous studies, such as Maharani (2024), which demonstrated that PjBL-based E-modules on Green Chemistry principles increased students' interest, with validation scores of 3.7 from material experts and 3.8 from media experts. Similarly, Wiasih's (2024) study showed that a socio-scientific PjBL-based E-module on energy sources improved students' comprehension, with validation scores of 84% from material experts and 93% from media experts. Furthermore, Janah et al. (2023) found that local wisdom-based E-modules could enhance students' motivation in vocational schools, with material and media validation scores of 89% and 88.88%, respectively.

6. CONCLUSION

Based on the research results, the following conclusions can be drawn:

1. At the define stage, the initial analysis through school observations and interviews with teachers showed that stoichiometry learning was still conventional and had not yet been linked to the cultural context and spiritual values, so innovation was needed in developing teaching materials that were by the characteristics and demands of the independent curriculum.
2. At the define stage, the analysis of the book material used by SMA Negeri 5 in 3 types of curriculum, namely KTSP, K13 and the Independent Curriculum, the assessment results were obtained in terms of the feasibility of content, presentation, graphics and language through the BSNP standard, namely 92% with a very feasible category. However, it has not implemented a contextual learning method in the form of PjBL and integrated local wisdom and culture.
3. At the design stage, an innovative E-module based on project-based Based Learning (PjBL) integrated with Ethnopedagogy has been developed on the material of stoichiometry chemistry. The ethnopedagogical concept that was raised was the culture of eating betel and spiritual values.
4. The innovative e-module based on PjBL integrated with ethnopedagogy of betel-eating culture and spiritual values in the material of stoichiometric chemistry has been validated by 3 media and material experts so that the overall average assessment results obtained from the material assessment are 93.99% with a very high category and are suitable for use in the field. The results of the overall average value of the media assessment aspect are 88.1% with a very high category and are suitable for use.
5. The e-module has been distributed to students, and the results of the response from the module display in the form of material display of 84.09% with a very interesting category, the usefulness aspect of 85.9% with a very interesting category, and the appearance aspect of 85.03% with a very interesting category.
6. The e-module has been distributed to 2 teachers, namely a chemistry teacher and a biology teacher, with the results of the questionnaire responses obtained a value of 84.375% in the aspect

of content suitability, 78.57% in the aspect of language suitability and 83.33% in the aspect of presentation suitability with an average value of 82.5% with the criteria "very high" and the module criteria are classified as very interesting.

7. FUTURE RESEARCH RECOMMENDATIONS

For further researchers to develop this research by using the developed module product in its implementation in the stoichiometry learning class. For further researchers to further develop the culture of eating betel not only in chemistry material but also in material in other scientific fields.

8. LIMITATIONS

The E-module is designed for high school grade XI and developed based on the Project Based Learning (PjBL) model in the stoichiometric chemistry course, focusing on stoichiometry material with the concept of moles and limiting reagents as its main topics. The study follows the 4D model methodology and integrates local wisdom by incorporating the tradition of eating betel nuts, a cultural practice from North Sumatra. The research is limited to conducting limited trials by gathering responses from students and teachers to evaluate the module's effectiveness and feasibility.

9. ACKNOWLEDGMENT

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