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Development of P5RA Module for Mastering 21st Century Skills of Madrasah Aliyah Students in Medan City

Tadzkia Nasywa Aqmarina(*), Ummi Nur Afinni Dwi Jayanti

Biology Education, Faculty of Education and Teaching Science,
Universitas Negeri Islam Sumatera Utara
Jl. William Iskandar Ps. V, Medan Estate, Percut Sei Tuan District, Deli Serdang Regency, North Sumatra 20371, Indonesia

***Corresponding Author:** tadzkianasywaaqmarina@uinsu.ac.id

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Abstract

Background: *The problem in the learning process at Madrasah Aliyah Medan City lies in the use of reference sources, specifically PowerPoint (PPT) modules, that have not been optimally linked to the mastery of 21St-century skills. This condition has an impact on the learning process, which has not been able to optimally develop students' critical, creative, collaborative, and communicative thinking skills that are very much needed in the current era. This study aims to develop the P5RA module as a learning medium that can improve students' mastery of 21St-century skills.* **Methodology:** *The research method used is Research and Development (R & D) with the 4D model (Define, Design, Develop, Disseminate) to produce a valid and practical module. Validity testing was conducted by involving material experts and media experts, who assessed aspects of the content's feasibility, language, presentation, module size, cover design, and overall module content.* **Findings:** *The results of the validity test showed that the percentage of assessment by material experts was 92.91 % and by media experts was 89.92 %. This validity test stage aims to refine the module to meet the criteria for very high validity. The practicality test was conducted through a field trial of the product involving teachers and facilitators as practitioners. The practicality assessment included aspects of the module's attractiveness, usefulness, and relevance to 21 St-century skills. The practicality test results reached a percentage of 91.46 %, categorized as efficient, requiring only minor revisions.* **Contribution:** *Based on these results, the developed module has met the feasibility and practicality requirements for use as a learning medium in P5RA activities, supporting students' mastery of 21 St-century skills*

Keyword: *21 St Century Skills; 4D Model; Development; Madrasah Aliyah Learning; P5RA Module*

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INTRODUCTION

The curriculum is a program designed to be applied by schools, with results evident in changes in student behavior (Aslan, 2016). According to Marisa (2021), the Character-Based Curriculum prioritizes the formation of student character, where learning outcomes are no longer determined by ranking but emphasize the talents and abilities of students. Globally, many countries have also adopted a character-based curriculum as part of 21st-century education. Countries such as Finland, Japan, and the United States emphasize the development of moral values, social-emotional values, and critical thinking skills in their curriculum. Finland stands out with a humanist approach that emphasizes empathy and social responsibility, while the United States integrates social-emotional learning programs to build self-awareness and interpersonal skills. Japan emphasizes discipline, hard work, and respect as key components of character education (Aditomo, 2024). In Indonesia, curriculum development employs a character-based approach, one of which is through the implementation of the Pancasila student profile (Faiz et al., 2022). The P5 Program (Pancasila Student Profile Strengthening Project) is a curricular activity that focuses on project development to strengthen competency and character development based on the Pancasila Student Profile, as outlined in the Graduate Competency Standards (Aditomo, 2024). The Pancasila student profile comprises 6 main dimensions: faith, devotion to God Almighty, noble character, global diversity, cooperation, independence, critical thinking, and creativity (Wijayanti et al., 2022).

Madrasas are public schools characterized by Islamic values; therefore, government-established educational policies also apply to madrasas, with some adjustments to accommodate their unique characteristics, needs, and requirements (Hariyanti, 2024). One of the specific characteristics of implementing P5 in madrasas is the addition of the Rahmatan lil' Alamin value, known as P5RA. The Rahmatan lil' Alamin value is reflected in the principles of attitudes and perspectives that guide the practice of religious teachings, ensuring that diversity in national and state life operates smoothly to safeguard public interest and protect humanitarian values within a religious context (Yudistira et al., 2024). According to the explanation by the Directorate of KSKK and the Ministry of Religious Affairs (2022), P5RA activities are expected to be an optimal means of encouraging students to become competent lifelong learners, develop character, and behave according to the values of Pancasila, and Islam Rahmatan lil' Alamin who have the characteristics of being moderate (tawassuth), balanced (tawazun), pioneers of goodness (qudwah), egalitarian (musawah), noble and civilized morals (ta'addub), committed to nationality (muwathanah), fair and consistent (i'tidal), democratic (syura), and tolerant (tasamuh), and dynamically innovative (tathawwur wa ibtikar). The ultimate goal is to cultivate students who embody the values of Pancasila and moderate religious beliefs.

The implementation of P5RA in Madrasahs follows the guidelines for the development of P5RA for the Ministry of Religion which is designed based on the P5 guidelines, drafted by the Agency for Standards, Curriculum, and Education Assessment (BSKAP) from the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) of the Indonesian Ministry of Education and

Culture (Kemendikbudristek, 2022). The guidelines from the Ministry of Education and Culture will then be adapted in Madrasahs by implementing several studies that take into account the characteristics and uniqueness of the Madrasah. The success of P5RA implementation is highly dependent on a mature design and timely implementation. In addition, effective P5RA implementation requires support from various devices that facilitate the learning process and student development.

The project module is a planning document used for the Pancasila Student Profile Strengthening Project. Its development process involves several specific stages. Rahmadayanti & Hartoyo (2022) state that the Pancasila Student Profile Strengthening Project Module was developed as a tool to support the implementation of the project, encompassing aspects of learning, media, development, and assessment. Educators have the freedom to create, choose, or modify the available modules depending on the context, characteristics, and capabilities of the learners. The development of project modules is equipped with basic components, including module identity, objectives, activities, and aspects (Aditomo, 2024). The development of P5RA modules aims to foster 21st-century skills in secondary schools, which is particularly important in today's educational context. This aligns with his research, which shows that implementing project-based modules can increase students' optimism and involvement in the learning process (Permadi, 2022). Ayu et al., (2023) state that the application of Pancasila and Rahmatan lil' Alamin values in each project enables this module to serve a dual function: as a learning medium and as a vehicle for building student character that aligns with the characteristics of Pancasila and Rahmatan lil' Alamin learners.

Research on the development of the P5 module has been extensively conducted. However, most existing research focuses more on the development of P5 modules with different themes and in the Elementary School context. Some of the researchers who have contributed to the development of P5 modules include Sa'bani et al., (2024), who developed the Pancasila student profile project module with local diversity themes for grade IV at SDN 2 Mranti. The subsequent research by Susilawati et al., (2023) with the development of the P5 module phase b with the entrepreneurial spirit in elementary schools, and the research by Nafisah (2024) with the development of the module project for the development of the Pancasila Rahmatan lil' Alamin student profile based on the Bojonegoro eco-culture in science lessons at MI Bahrul Ulum 1 Balen. However, the development of a contextual and integrated P5RA module, especially in biology learning at the Madrasah Aliyah level, which combines strengthening the Pancasila student profile with the values of Rahmatan lil' Alamin, remains very limited and has not been widely explored. Existing research on the development of biology learning modules tends to focus on the integration of Islamic aspects or the Qur'an in general, such as the Qur'an-integrated biology module on biotechnology material (Aulia et al., 2023), the SETS-based biology module integrating Islam into ecology material (Sudrajat, 2023), and the development of e-modules containing P5 on biological technology innovation material (Supratman et al., 2025). However, these modules have not specifically integrated the P5RA approach, which prioritizes 21st-century skills as well as the values of Rahmatan lil' Alamin in the context of biology learning at Madrasah Aliyah.

In addition, the results of an interview with one of the P5RA facilitators at MAN 3 Medan showed real obstacles in the implementation of P5RA learning. Teachers still use PowerPoint (PPT)-based P5RA modules that are less integrated and have not linked the material to the development of 21st-century skills. 21st-century skills education not only emphasizes the development of knowledge, but also soft skills such as communication, collaboration, critical thinking, creativity, and understanding, which are also one of the values of Rahmatan lil 'Alamin. This study aims to develop a valid, practical, and contextual P5RA module, particularly in biology learning at the Madrasah Aliyah level, ensuring it aligns with the curriculum's demands, the characteristics of today's students, and encourages the mastery of 21st-century skills.

Based on the background and previous research studies, the researcher wants to develop a P5RA module for mastering 21st-century skills. This research is expected to produce teaching materials that are feasible and practical for implementing P5RA activities (Pancasila Rahmatan lil' Alamin Student Profile Strengthening Project), aligning with student needs and various 21st-century skills. 21st-century skills can be integrated into biology subjects. One of the biology subject materials in class X of high school is the material on environmental change and preservation. This material contains ecological problems and environmental preservation efforts. To facilitate student understanding of the material, the P5RA module focuses on sustainable lifestyles, emphasizing integrated waste management. This effort aims to enhance students' understanding of environmental change and preservation, promoting a deeper appreciation for the importance of maintaining ecological sustainability within the school and its surrounding areas. Furthermore, the implementation of P5RA is expected to strengthen the character of Pancasila students, who are guided by the principle of rahmatan lil alamin.

METHOD

This study examines the development of the Pancasila and Rahmatan lil' Alamin Student Profile Strengthening Project (P5RA) module to improve 21st-century skills mastery in high school students, using the Research and Development (R&D) method. The R&D method itself is a research approach aimed at producing innovative products or developing existing products for learning purposes (Muqdamien et al., 2021). R&D development is used to create or validate products used in education and learning (Elvarita et al., 2020). In this approach, product development is based on a reference model. This study applies the 4D model, which includes the Define, Design, Develop, and Disseminate stages (Thiagarajan et al., 1974). The stages in the 4D model design are illustrated in Figure 1.

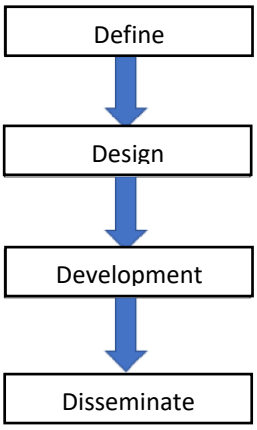

Figure 1. 4D Model Design

The stages of Thiagrajan's research and development model can be explained as follows: (1) Define, which involves finding the background of the problem and analyzing the objectives. This stage involves gathering data and information on the teaching devices required by teachers and students in P5RA activities, as well as determining the products to be developed. (2) Design activities to design products that have been determined in the form of project modules, starting with the creation of storyboards by considering various features and developments to be created. (3) Development, activities to make designs into products, and conduct product validity tests according to certain specifications. (4) Dissemination, activities to disseminate products that have been tested so that they can be used.

This study involved four expert validators, comprising two material experts and two media experts. The validators were selected based on competency and experience criteria in the fields of learning, development of learning materials, and understanding of the Independent Curriculum, as well as strengthening the Pancasila student profile. Material experts possess a scientific background relevant to biology learning materials and character education, while media experts are proficient in designing and developing digital and printed learning materials. In addition, the practicality test involved three teachers/facilitators from Madrasah Aliyah Negeri 3 Medan who are active in P5RA activities and implement the Independent Curriculum with a focus on the values of rahmatan lil'alamin. This Madrasah is a religious high school with characteristics that are suitable for module testing. The validation of 21st-century skills was carried out by material expert validators who possess a deep understanding of the concept of 21st-century skills and teachers/facilitators who are familiar with the implementation of these skills in learning. Validators assess the suitability of skill indicators such as critical thinking, creativity, collaboration, and communication contained in the module and the practicality questionnaire instrument. Thus, this validation ensures that the module supports the development of students' 21st-century skills.

The process of developing the P5RA module begins with identifying the background of the problem and analyzing the objectives by conducting a preliminary research interview with one of the P5RA teachers or facilitators. In the interview activity, the researcher used an interview guideline to obtain qualitative data from the

teacher/facilitator regarding the needs and obstacles to implementing the module. After determining what product will be developed according to the needs of teachers and students, the design of the P5RA module begins with creating a storyboard that considers various aspects and elements to be included. It then compiles the module content into activities tailored to the needs of educators and students. Furthermore, the module that has been designed will be developed into a product, and a validation test will be conducted to ensure whether the product is suitable for use. The validation stage begins with the provision of the P5RA module to the validators to be assessed using a validation rubric that includes aspects of the feasibility of content, language, presentation, size, cover design and module content, as well as the suitability of the module with 21st century skills (critical thinking, creativity, collaboration, communication). Validation employs a Likert scale of 1–4 (Strongly Disagree to Strongly Agree), as outlined by Arikunto (2013) and Sugiyono (2013). After completing the validation instrument, the assessment results and suggestions are analyzed to identify the aspects of the module that require revision. Module validation is only carried out by material experts, media, and practitioners because they possess sufficient competence and experience to assess the feasibility and practicality of the module objectively and in-depth. Material and media experts assess the suitability of the content and the technical aspects of the media, while teachers and facilitators, as practitioners, provide a perspective on implementation in the field. This is important to ensure that the module is not only theoretically valid but also practical and applicable.

After validation, the module was revised based on input and suggestions from the validators to enhance the content, language, design, and technical aspects, thereby meeting the criteria for very high validity. The revised module was resubmitted for revalidation. Furthermore, teachers and facilitators tested the module in the field, collecting practical data through a questionnaire that measured the attractiveness, ease, and benefits of the module, as well as students' mastery of 21st-century skills. The final improvements were made by referring to the results of the practicality test, ensuring the module is truly feasible and ready for maximum use.

The data analysis techniques employed in this study included both qualitative and quantitative data. Qualitative data consisted of written information, interviews with respondents, as well as suggestions and positive responses from the validator team. Quantitative data were obtained from assessment scores provided by validators and questionnaires completed by teachers as field practitioners. The data obtained were then analyzed and processed descriptively, qualitatively, and quantitatively. The validity data of the P5RA module was obtained from the expert validator's assessment score. At the same time, the practicality data was obtained from the guvruv assessment score. Quantitatively, the data received was then analyzed to include data calculated using Rule 1. Furthermore, the findings obtained from the data analysis regarding the validity and practicality of the module were interpreted using the criteria outlined in Tables 1 and 2 of the module. The rules used in calculating the data refers to (Thahira & Jayanti, 2024).

$$Presentage\ (\%) = \frac{Score\ obtained}{Score\ maximum} \times 100\% \quad \text{..... (1)}$$

Table 1. Validity Assessment Result Criteria, Refers to Riduwan & Akdon (2010)

Precentage (%)	Criteria
80.00-100.00	Very Valid
60.00-79.99	Valid
50.00-59.99	Quite Valid
00.00-49.00	Not Valid

Table 2. Practicality Assessment Result Criteria, Refers to Riduwan & Akdon (2010)

Precentage	Criteria
81% - 100%	Very Practical
61% - 80%	Practical
41% - 60%	Quite Practical
21% - 40%	Not Practical

RESULT AND DISCUSSION

The product developed in this research is a P5RA module to evaluate students' 21st-century skills (Figure 2). After the module is tested, a validation test is conducted to assess its feasibility for use and application in learning. The stages in this development research include background research activities and objective analysis, data and information collection on the teaching devices required by teachers and students in P5RA activities, and determining the products to be developed. The activity of designing a product, which is specified in the form of a project module, begins with the development of a storyboard that considers various features and developments to be created. The activity of making a design into a product and conducting a product validity test according to certain specifications. The activity of disseminating products that have been tested for use.

Figure 2. P5RA Module

Validation is necessary to ensure that the developed product is suitable for use and distribution. This finding aligns with previous research highlighting the importance of expert involvement in the validation process of learning module development. Research by Widodo & Jasmadi (2008) indicates that learning modules thoroughly validated by experts have a significant impact on enhancing the quality of learning, particularly in terms of content clarity, visual appeal, and language cohesion. Based on the validation results, quantitative and qualitative data were obtained. This validation involves several categories, including media expert validation, mathematics experts, and field practitioners, in response to the governor or facilitator.

The instrument used to validate material experts consists of 14 assessment aspects covering content feasibility, language feasibility, and presentation aspects. The instrument used to validate media experts consists of 12 assessment aspects: module development, module cover design, and module content design, while the instrument used to validate practicality consists of 20 assessment aspects. The data from the validation tests of material experts and media experts are written in Table 3.

Table 3. Module Validity Test Results

Validator	Assessment Aspect	Percentage (%)	Average (%)	Description
Material Expert	Content Feasibility	95	92.91	Very Valid
	Language Feasibility	90		Very Valid
	Presentation	93.75		Very Valid
Media Expert	Module Design	91.66	89.92	Very Valid
	Module Cover Design	87.5		Very Valid
	Module Content Design	90.62		Very Valid

Based on data from table 3, the results of the preliminary score of the module validity test conducted by the material experts from the aspect of content feasibility are 95 % with a very valid category, the element of language feasibility is 90 % with a very valid category, and the aspect of presentation is 93.75 % with a very valid category. The average preliminary score of the module validity test results, conducted by material experts, is 92.91 %, indicating a very high level of validity. This suggests that the content, language, and presentation of the module are of high quality and suitable for use without requiring major revisions. This research falls into the very valid category, as defined by the validity interpretation standard, which sets the range of 81 % to 100 % as very valid (Widiyanti & Anugraheni, 2022). The results of the module validity test, carried out by media experts, are 91.66 % in the very valid category for the module development aspect, 87.5 % in the very valid category for the module content development aspect, and 90.62 % in the very valid category for the module content development aspect. The average pre-test result of the module validity test conducted by media experts is 89.92 %, which falls within a very valid category. This indicates that the media is suitable for use, offering excellent quality in terms of technical, convenience, and practical aspects (Agusti et al., 2023). The media has a

valid criterion that does not require significant revision and is ready to be applied in learning. The data from the module's practicality test results are presented in Table 4.

Table 4. Results of the Module Practicality Test

Validator	Assessment Aspect	Percentage (%)	Average (%)	Description
Field Practitioner	Practicality of the module in learning includes:		91.46	Very Practical
	Withdrawal	83.33		Very Practical
	Effectiveness	88.88		Very Practical
	Usefulness	94.44		Very Practical
	Evaluation of students' 21st-century skills includes:		91.46	Very Practical
	Critical Thinking	91.66		Very Practical
	Creativity	86.11		Very Practical
	Collaboration	100		Very Practical
	Communication	95.83		Very Practical

Based on data from table 4, the results of the preliminary score of the module practicality test carried out by the P5RA governor or facilitator as a field practitioner from the withdrawal aspect were 83.33 % in the very valid category, the convenience aspect 88.88 % in the very valid category, and the module usefulness aspect 94.44 % in the very valid category. In addition to the above aspects, field practitioners also respond to assessments of students' 21st century skills assessments and obtain critical thinking assessment results of 91.66 % in the very valid category, creativity of 86.11 % in the very valid category, collaboration of 100 % in the very valid category, and communication of 95.83 % in the very valid category. It is known that the average percentage of the results of the module practicality test, carried out by the P5RA facilitator or teacher as a field practitioner, is 91.46% in the very valid category. This score indicates that the module is easy to understand, easy to operate, and effective in supporting project-based learning activities that promote 21st-century skills such as critical thinking, creativity, collaboration, and communication (Thoha et al., 2025). This aligns with their research (Berlianti & Jatiningsih, 2023), which indicates that the P5-based module significantly enhances 21st-century skills, particularly in aspects such as collaboration, communication, and creativity. Practical modules facilitate student project completion and guide them in developing learning outcomes, positively impacting student motivation and learning outcomes. Furthermore, the Directorate of KSKK & Ministry of Education (2022) also published a guide to developing student profile projects, emphasizing the importance of integrating Pancasila and Rahmatan lil Alamin values into learning to build character and 21st-century skills holistically. Based on the validation results, several suggestions and criticisms were provided for improving the module, as shown in Table 5.

Table 5. Criticism and Suggestions from Validators

Validator	Criticism and Suggestions
Material Expert	Regarding students' work, it should be adjusted to the level of education.
	Students' work should be further improved. For example, generating alternative technologies for waste management
	Please include appropriate awards for the best educators
Media Expert	Please add images that support understanding of the material
Field Practitioner	This module is already suitable for use, but some writings still need to be revised
	In terms of writing and layout, the module is still neat and consistent on several pages
	Please pay attention to the layout of the module, especially the page margins

Based on the data in Table 5, criticisms and suggestions were provided by validators, including material expert validators, media experts, and field practitioners, through the P5RA facilitator during the P5RA module development process. The material expert validator provided three main inputs related to the suitability of the learning content. First, students' work needs to be adjusted to the level of education to suit the skills and character of students. Second, the focus of students' work needs to be improved and narrowed by providing concrete examples, such as producing alternative energy through waste management. Third, a decent reward system needs to be implemented for the top-performing students as a means of motivation and appreciation for their achievements. The media expert validator provided input on the addition of images that support understanding of the material, indicating that the visual aspect in the module still needs to be strengthened to enhance learning feasibility. The field practitioner validator provided input related to the technical and practical aspects of the module. Although the module assessment was suitable for use, the validator identified several aspects that needed improvement, including the selection of content that still required revision, inconsistencies in the layout between pages, and the need for page margin updates to enhance readability.

Based on criticism and suggestions from the validators, researchers can use this input as material for evaluating and improving the module to enhance it and adapt it to the needs of education in the 21st century. The criticism and suggestions provided are an integral part of the revision process that supports the development of a valid P5RA module suitable for use in learning at Madrasah Aliyah. This improvement aligns with the development of other research that emphasizes the importance of validation from various parties in producing a learning module that is both valid and applicable in the field (Aisyah & Suryana, 2023). Thus, this table serves as a document of the revision process, supporting the creation of a valid P5RA module suitable for use in teaching and learning at Madrasah Aliyah.

Criticism and suggestions from the validators indicate that the development of the P5RA module has undergone a comprehensive and multi-perspective evaluation

process. Material experts focus on the suitability of content to student characteristics and provide motivation. Media experts emphasize the visual aspects to support understanding, while field practitioners provide technical input to facilitate ease of implementation in the field. This input shows that the P5RA module has a strong foundation but still needs improvement in terms of level adjustment, visualization, and technical consistency. The results of the P5RA module development research on students' mastery of 21st-century skills were obtained using a 4D model development process that involves several steps, such as conducting a needs analysis, designing modules, developing them, and distributing them. Overall, the criticism and suggestions provided by the validator contribute to improving the quality of relevant and strategic modules in responding to today's educational challenges and helping a generation of students who excel and embody national values and religious moderation.

CONCLUSION

According to research findings, the P5RA module development process, which supports students' mastery of 21 *St*-century skills, follows the 4D model: Define, Design, Develop, and Disseminate. This model encompasses needs analysis, design, development, and module distribution. Based on the assessment by the material and media validators, this module received a highly valid rating, with a percentage above 89 %, and practical for use by teachers, scoring 91.46 %, although it requires minor revisions. The P5RA module offers an innovative solution, replacing the previous module, which was limited to a PowerPoint presentation and less effective in developing 21 *St*-century skills. This module also facilitates teachers in implementing interactive learning that focuses on developing students' character and skills, and supports the Independent Curriculum. However, the development of this module has only reached the practical stage because it is only implemented once a semester for 2-3 weeks. Therefore, further research is needed to comprehensively and in-depth test the module's effectiveness in improving students' mastery of 21 *St*-century skills.

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