



Innovation of Edupreneurship-based Science Literacy Module to Increase Independent Dimensions of Elementary School Students

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ABSTRAK

Kemandirian merupakan salah satu tujuan utama dalam pendidikan nasional. Namun, pendidikan juga digemparkan dengan fenomena generasi srawberry yang salah satu indikatornya adalah rendahnya kemandirian siswa. Penelitian ini bertujuan untuk mengembangkan inovasi modul literasi sains berbasis model pembelajaran ajak-temani-mandiri terintegrasi dengan edupreneurship untuk meningkatkan kemandirian siswa sekolah dasar. Metode penelitian ini adalah penelitian dan pengembangan Borg & Gall dengan tahapan: penelitian dan pengumpulan informasi; perencanaan; mengembangkan bentuk awal produk; uji lapangan pendahuluan; revisi produk utama; pengujian lapangan utama; revisi produk operasional; uji lapangan operasional; revisi produk akhir; dan sosialisasi & implementasi. Subjek coba pada penelitian ini adalah satu expert judgement yang memvalidasi instrumen, dua expert judgement sebagai validator produk: yaitu validator sumber belajar dan materi. Sedangkan Subjek uji coba terbatas penelitian ini adalah siswa kelas IV SDNS yang berjumlah 21 siswa dan untuk uji coba luas siswa kelas IV SDNM1 dengan jumlah 56 siswa. Teknik pengumpulan data dilakukan dengan teknik wawancara, observasi dan kuesioner. Teknik analisis data menggunakan teknik deskriptif kualitatif dan kuantitatif berupa statistik inferensial. Hasil penelitian ini menunjukkan bahwa dihasilkan modul literasi sains dengan karakteristik sesuai dengan tahapan model pembelajaran ajak-temani-mandiri terintegrasi dengan edupreneurship yang valid dan terbukti efektif untuk meningkatkan kemandirian siswa SD.

ABSTRACT

Independent attitude is one aspect of the main goals of education. However, this independent attitude needs special attention, as currently the strawberry generation phenomenon which is characterized by children's low level of independence is widespread including in Indonesia. This research aims to develop innovative a scientific literacy module based on *Ajak-Temani-Mandiri* learning model integrated with Edupreneurship to increase the independent attitude of elementary school students. This research used Borg & Gall research and development method with stages, namely: research and information collecting; planning; develop preliminary form of product; preliminary field testing; main product revision; main field testing; operational product revision; operational field testing; final product revision; and dissemination & implementation. The subjects in this research were one expert judgment who validated the instrument, two expert judgments as product validators: namely validators of learning resources and materials. Meanwhile, the limited trial subjects for this research were class IV students at SDNS, totaling 21 students, and for the wide trial, class IV students at SDNM1, totaling 56 students. Data collection techniques were carried out using interview, observation and questionnaire techniques. The data analysis technique used qualitative and quantitative descriptive techniques in the form of inferential statistics. The results showed that a scientific literacy module was produced with characteristics in accordance with the stages of *Ajak-Temani-Mandiri* learning model integrated by edupreneurship which is valid and proven was able to increase students' independent attitude of elementary school students.

1. INTRODUCTION

Independent attitude is one aspect of the main goals of education (Naibaho, 2019; Nisa et al., 2022; Supriyoko et al., 2022). This attitude needs special attention in education, as currently the strawberry generation phenomenon which is characterized by children's low level of independence, easily giving up, being lazy, pessimistic and other negative attitudes, is widespread including in Indonesia (Fauzi & Tarigan, 2023; Hapsari et al., 2022). This phenomenon shows that there needs to be more attention in increasing student independence, especially through the learning process. Instilling independent attitude is one of the special concerns in *Merdeka Curriculum*. This curriculum is packaged with project-based learning which has an important role in preparing students with Pancasila student characteristics, including an independent dimension. The implementation of *Merdeka Curriculum* provides freedom and refreshment to

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the post-pandemic Indonesian education climate in accordance with the Indonesian education philosophy (Dian et al., 2023; Yunaini et al., 2022). This curriculum has the characteristics of serving students, focuses on the essence of the material, contextual, and provides meaningful learning to students through learning projects to strengthen *Profil Pelajar Pancasila*. *Profil Pelajar Pancasila* is internalized into six dimensions, namely Believing and fearing God Almighty, global diversity, mutual cooperation, independence, critical thinking and creativity (Daga, 2020; Santoso et al., 2023). Teacher readiness in implementing the project to strengthen *Profil Pelajar Pancasila* is the key to successful implementation of the *Merdeka* Curriculum. Teachers are expected to be able to design learning that serves students, is contextual to everyday life, prioritizes essential material according to students' developmental stages and is more relevant and interactive through the project to strengthen *Profil Pelajar Pancasila* (Dzulhidayat, 2022; Irawati et al., 2022; Pardimin et al., 2023). The results of a survey involving 30 respondents showed that each educational unit does not yet have supporting modules that can be used as supplements in implementing the *Merdeka* curriculum. The data obtained shows that 96.7% of respondents stated that they did not have a project-based learning module that was integrated with edupreneurship.

However, the results of observations and questionnaires show that there are problems faced by teachers in implementing the *Merdeka* curriculum, including the lack of learning resources that support project-based activities and are able to support students' independent learning, especially in Natural and Social Sciences learning. Researchers obtained data that 93% of respondents needed learning modules that supported the project to strengthen *Profil Pelajar Pancasila* in accordance with edupreneurship theme. The following data show that the independent dimension is the lowest dimension and need more attention than the other six dimensions of *Profil Pelajar Pancasila*. Thus, the low independent dimension be the biggest concern for most respondents. Researchers carried out observational analysis of students' independent attitude. The results of the observation showed a percentage of 49,01%. The student independence category falls into the very less independent qualification category. The result of observations that have been made also show that students do not have the ability to recognize emotions well, are not able to recognize their own qualities and interests and do not have the ability to reflect on themselves well. Observation results also show that the ability to show initiative and work independently is still low, and student's discipline, self-confidence and adaptive attitude also need to be improved (Boldureanu et al., 2022; Desvian et al., 2021; Kopzhassarova et al., 2016). Based on the data, it shows that independent dimension of students needs to be improved. Moreover, this independent dimension is the main goal of education (Alfatah et al., 2021; Maryono et al., 2018; Mery et al., 2022; Saputri & Mukmin, 2021).

One of alternative solutions that can be used to increase student independence is to develop modules as a source of student independent learning. The module has benefits including: 1) help teachers explain verbal material more easily to understand; 2) overcome the limitations of time, space and students' five sensory abilities; 3) provide interesting learning materials and guides for students and 4) train students' independent attitudes (Ananda & Mukhadis, 2016; Cristiana et al., 2021; Hardiansyah et al., 2022). The module developed is integrated with edupreneurship. Edupreneurship is able to teach students how to introduce entrepreneurial concepts which is completed with practice through the educational process, using entrepreneurial strategies, and selecting products as well as how to market them. It is also believed that edupreneurship is able to instill students' independent and creative attitudes (Maknuni, 2021; Widyaningtyas, 2022). The importance of edupreneurship gives students an idea of working world and instilling an entrepreneurial spirit from elementary school which is useful for their future life (Khulafa et al., 2017; Amrullah et al., 2021). This developed module contains scientific literacy which can provide the ability to use scientific knowledge, identify questions, and draw conclusions based on empirical evidence and decisions related to nature and changes to nature through human activities.

One of learning models that has been proven appropriately for increasing students' independent dimensions is *Ajak-Temani-Mandiri* Learning Model/ *Model Pembelajaran Ajak-Temani-Mandiri* (MPATM) (Nisa et al., 2023; Yuniharto & Nisa, 2022). MPATM is a learning model based on Tamansiswa teachings, the essence of Ki Hadjar Dewantara's three teachings: 1) Leadership Trilogy (*Ing ngarsa sung tuladha, Ing madya mangun karsa, Tut wuri Handayani*); 2) *Tri Nga* (*Ngerti, Ngrasa, Nglakoni*) and 3) *Tri N* (*Niteni, Niroake, Nambahake*). This research aims to develop innovative a scientific literacy module based on *Ajak-Temani-Mandiri* learning model integrated with edupreneurship to increase the independent attitude of elementary school students. The novelty of this module developed is designed by integrating educational aspects, which is implemented based on the stages of *Ajak-Temani-Mandiri* learning model.

2. METHOD

The type of research used is research and development (R & D). Research and development is research that produces certain products referring to Borg & Gall's research and development theory (Borg

& Gall, 1983). The research and development model by Borg & Gall has 10 stages as follows. 1) Research and information collecting. 2) Planning. 3) Develop preliminary form of product: at this stage, the researcher develops appropriate modules to increase student independence: based on MPATM and edupreneurship. 4) Preliminary field testing: at this stage, the researcher conducts a Focus Group Discussion (FGD) with expert judgment to validate the product being developed. FGD is planned to involve two experts, namely one expert in the field of science materials, and one expert in the field of elementary school learning resources. 5) Main product revision; 6) Main field trial; 7) Revision of operational products; 8) Field operational testing; 9) Final product revision: the results of wider scale trials are then analyzed and product improvements are made. 10) Dissemination & implementation: the final product is then disseminated in the journal.

The research subjects in this research consisted of 30 teacher respondents in collecting needs analysis data, 21 class IV SDNS students which consist of 11 boys and 10 girls in main field trial, and 56 class IV SDNM1 students consist of 28 boys and 28 girls in field operational testing. Data collection techniques are carried out through interviews, observation and questionnaires. The observations made in this research were carried out to measure the increase in student independence after using the developed module. The instrument for measuring independence is based on eleven indicators which can be seen in [Table 1](#).

Table 1. Dimensions of Students' Independent Attitude

Elements	Indicators
Self-understanding and situation faced	1. Have courage in acting and making decisions
	2. Act reflectively
	3. Have good self-regulation and emotional management
	4. Have a perspective in achieving goals
	5. Do not depend on other people
	6. Have responsibility
Self-regulation	7. Discipline
	8. Self-confident
	9. Have initiative
	10. Act adaptively
	11. Not easily give up

The questionnaire in this research was conducted to measure the validity or feasibility of the product that has been developed. Validation is carried out by material experts and learning resource experts at elementary schools. The assessment indicators by material experts can be seen in [Table 2](#).

Table 2. Product Validation Indicators by Material Experts

Aspects	Indicators
Self-instruction	1. Students who study using modules can learn independently without depending on other people
	2. The material developed is in accordance with the learning objectives to be achieved in the module
	3. The module contains specific learning material/activities so that it is easy for students to learn
	4. The module contains illustrative images that support the presentation of learning material
	5. The module contains independent assignments, practice questions or evaluations that are able to measure student mastery
	6. The module contains instructions and working methods that make it easier for students to learn independently
	7. The sentences presented in the module are contextual and easy to understand
Self-contained	1. Students are able to study the material completely and comprehensively in one unit according to the Learning Outcomes/ <i>Capaian Pembelajaran</i> (CP).
	2. The material in the module is presented in accordance with the rules and concepts of science in elementary school.
	3. The material in the module is arranged in a structured manner according to the Syntax stages of the <i>Ajak Temani Mandiri</i> Learning Model
	4. Modules are arranged systematically by paying attention to the Learning Outcomes/ <i>Capaian Pembelajaran</i> (CP) that must be mastered by students.

Aspects	Indicators
Stand alone	<ol style="list-style-type: none"> 1. Learning modules can be studied without assistance from other print media 2. The modules are provided with images, instructions, learning video links which help students to learn extensively. 3. The material in the module makes it easier for students to work on practice questions, evaluation questions and projects.
Adaptive	<ol style="list-style-type: none"> 1. The module contains up-to-date learning in accordance to developments in science and technology 2. The module is integrated with edupreneurship which may increase the independent attitude of elementary school students 3. The module can be used for a long time
User friendly	<ol style="list-style-type: none"> 1. The module has characteristics that are easy to use for elementary school students 2. The instructions in the module make it easier for students to learn 3. The instructions in the module use active and simple sentences that are easy for elementary school students to understand 4. The language and sentences in the module use general terms and are easy for students to understand 5. The module has characteristics that are easy to use for elementary school students

The modules developed were also validated by elementary school learning resource experts with the indicators listed in [Table 3](#).

Table 3. Product Validation Indicators by Elementary School Learning Resource Experts

Aspects	Indicators
Format	<ol style="list-style-type: none"> 1. The module developed is HVS B5 paper size in accordance with ISO standards which can be accessed in soft file and hard file form 2. The opening section of the module contains a cover, table of contents, foreword, main material title, concept map, and learning outcomes (<i>Capaian Pembelajaran</i>) 3. The core part of the module contains learning materials, learning activities, practice activities, and edupreneurship-project-based learning activities. 4. The closing section contains a summary of the material, glossary, learning evaluation and learning reflection. 5. The systematics in the module contain the MPATM syntax
Font and Size	<ol style="list-style-type: none"> 1. The font and size are appropriate and contain readability elements 2. The color composition is appropriate 3. The color contrasts with the background 4. Image proportions are appropriate
Attraction	<ol style="list-style-type: none"> 1. The composition and size of layout elements are proportional and appropriate to the content 2. Layout colors clarify functions 3. The module attracts students' learning interest 4. The module can motivate student learning through attractive illustrations 5. Modules avoid the same concepts and have a clear point of view 6. Illustrations are appropriate and suitable for elementary school students 7. A series of modules attracts students to study independently 8. The module encourages students to develop life skills with the theme of edupreneurship
Empty space	<ol style="list-style-type: none"> 1. The spacing in the module is appropriate 2. The space around the chapter and sub-chapter titles is appropriate 3. Placement of writing and images is appropriate 4. Substitutions between paragraphs begin with a capital letter
Consistency	<ol style="list-style-type: none"> 1. Font and size are consistent from page to page 2. The distance between the title and the first line is consistent 3. The page numbers are consistent 4. The location of images, illustrations, tables and charts is consistent

This research and development data analysis technique uses qualitative and quantitative descriptive in the form of inferential statistics. Qualitative descriptive is carried out to describe the characteristics of the module being developed, while quantitative techniques are used to measure validity

and increase in independent attitudes based on the percentage of product feasibility qualification guidelines and the percentage of guidelines for increasing independent attitudes.

3. RESULT AND DISCUSSION

Result

Innovation of a collection of scientific literacy modules containing Natural and Social Sciences/*Ilmu Pengetahuan Alam dan Sosial* (IPAS) subjects which are limited to science material. The module is limited to learning outcomes/*Capaian Pembelajaran* (CP), namely: students can identify problems related to the preservation of natural resources in the surrounding environment and their relationship to efforts to preserve living things. The module innovation carries the theme of plants as the source of life. Each material chapter consists of 3 parts according to *Ajak Temani Mandiri* Learning Model Phase, namely *Ajak*, *Temani*, and *Mandiri*. *Ajak* section contains an introduction to the material, concept maps, learning objectives, and a collection of scientific literacy according to the main topic. *Temani* section contains a guide to project-based learning activities and a project guidance sheet. *Mandiri* section contains worksheets detailing project financing, worksheets on marketing project results, and learning evaluation questions. The module is available in B5 size print form and soft file in the form of pdf. The module is equipped with attractive images and instructions that can help students learn independently. The results of product validation by material experts can be seen in [Table 4](#).

Table 4. Product Validation Results by Material Experts

Aspects	Material Expert Assessment
Self-instruction	4.86
Self-contained	5.00
Stand alone	5.00
Adaptive	4.33
User friendly	5.00
Product Quality Percentage	96.76
Product Quality Qualification	Very Feasible

Base on [Table 4](#), the results of module validation according to material experts, elementary school learning resource experts, teacher and student responses to the product meet the very appropriate criteria. Material experts gave a product quality percentage of 96.76 with a very feasible category. The product validation results according to elementary school learning resource experts can be seen in [Table 5](#).

Table 5. Product Validation Results by Elementary School Learning Resource Experts

Aspects	Assessment of Elementary School Learning Resource Experts
Format	5.00
Font and size	5.00
Attraction	4.75
Empty space	4.75
Consistency	4.75
Product Quality Percentage	97.00
Product Quality Qualification	Very Feasible

Base on [Table 5](#), the results of module validation according to elementary school learning resource experts meet the criteria of very feasible. Elementary learning resource experts provide an assessment of product quality at a percentage value of 97.00. The results of the teacher's response to the product during the trial can be seen in [Table 6](#).

Table 6. Results of Teacher Responses to The Product During The Trial

Aspects	Responder		
	Teacher A	Teacher B	Teacher C
Module design	5.00	4.33	5.00
Module Content	5.00	4.92	4.75
Product Quality Percentage	100.00	92.50	97.50
Product Quality Qualification	Very Feasible	Very Feasible	Very Feasible

Base on Table 6, the results of 3 (three) teachers' responses to the product met the criteria of being very feasible. Teacher A gave an assessment of product quality at a percentage value of 100. Teacher B gave a percentage value of 92.50 and teacher C gave a percentage value of 97.50. Researchers also asked 72 grade VI elementary school students during trials is show in Table 7.

Table 7. Results of Student Responses to The Product During The Trial

Elements	Assessment Results
Module design	4.56
Module Content	4.55
Product Quality Percentage	91.09
Product Quality Qualification	Very Feasible

Base on Table 7, the results of student responses to the product during the trial belong to category of very feasible. Test results of Product effectiveness on students' independent attitude is show in Table 8.

Table 8. Test Results of Product Effectiveness on Students' Independent Attitude

Elements	Initial Observations	Testing Phase	
		Main field Testing	Operational field Testing
Self-understanding and situation faced	1.92	3.62	3.84
Self-regulation	2.00	3.73	3.90
Average	1.96	3.67	3.87
Percentage of Independent Attitude	49.01	91.87	96.73
Qualification of Independent Attitude	Very Less Independent	Very Independent	Very Independent

Base on Table 8, the test results of the effectiveness of the scientific literacy module on student independence have proven to be effective, this is proven by an increase in the average of students' independent attitudes

Discussion

Module innovation is relevant to the development of generation Z who is full of creativity and curiosity (Fauzi & Tarigan, 2023; Hapsari et al., 2022). The innovation of MPATM-based project science literacy modules integrated with edupreneurship containing Natural and Social Sciences/ *Ilmu Pengetahuan Alam dan Sosial* (IPAS) subjects is limited to science material. The module was innovated according to 10 development steps, namely: 1) research and information collecting: it was found that field conditions require a scientific literacy project module that is integrated with edupreneurship to increase students' independent dimensions (Borg & Gall, 1983). The results of interviews, questionnaires and learning observations show that students fall into very low criteria with an independence score of 49,03%. Next, the researcher carried out planning based on the analytical data that had been obtained, then designed the right solution to increase students' independent attitude. The researcher then analyzed the Learning Outcomes/*Capain Pembelajaran* (CP) used, namely that students were able to identify problems related to the preservation of natural resources in the surrounding environment and their relation to efforts to preserve living things and then formulate learning objectives/*Tujuan Pembelajaran* (TP). Researchers formulated the theme of plant material as the source of life by paying attention to the procedures for implementing *Merdeka* curriculum.

The third stage is develop preliminary form of product by developing a module according to material experts that meets the five characteristics of the module, namely self-instruction, self-contained, stand alone, adaptive, and user friendly *friendly* (Acesta et al., 2020; Monica et al., 2021; Nisa et al., 2022). The first characteristic is self-instructional, module is developed based on complete systematics for students to learn independently. The systematics of the module also fulfills several things, namely the format, font and size, the attractiveness of the module, the placement of empty space in placing illustrations and pictures and consistency in the content of the module adapted for fourth grade elementary school students. The modules developed are also prepared by considering the design and module content. The self-contained module, the project's scientific literacy module innovation is structured in accordance with MPATM syntax starting from *Ajak* phase, *Temani* phase, and *Mandiri* phase (Efendi & Barkara, 2021; Safaruddin et al., 2020; Yuniharto & Nisa, 2022). *Ajak* phase section provides students with sensory experience to observe the objects being studied in accordance with the sequence of material presented

systematically. *Temani* phase provides students with the experience of seeing real objects through observation and investigation with the help of observation sheets. This *Temani* phase provides students with direct experience to confirm the content of the material they have studied with found objects around them. *Mandiri* phase gives students experience in carrying out projects related to the topics they have studied and teaches students entrepreneurship.

Preliminary field testing: at this stage, the researcher conducts a focus group discussion with expert judgment to validate the product being developed. In the FGD, the researcher involved two experts, namely one expert in the field of science materials, and one expert in the field of elementary school learning resources (Marshel & Ratnawulan, 2020; Meiranti, 2012). The material expert gave a very Feasible assessment with a percentage of 96,76. The material expert provided several notes to improve the writing of Enhanced Spelling of the Indonesian Language/*Ejaan Yang Disempurnakan* (EYD), the use of punctuation in command sentences, and the addition of columns to students' shopping record worksheets. The elementary school learning resource expert assessed that the module developed met the very appropriate criteria with a percentage score of 97,00. Elementary school learning resource experts stated that the module developed meets the criteria for a good module and is contextual for elementary school students. Elementary learning resource experts provide input to complete the module with a bibliography.

Researchers also received a positive response to the module developed during operational field testing. The results of the product which was tested on a larger scale at SDNM1 with two IV classes totalling 56 students had an impact on very independent students with a score of 96,73. Teacher B's response to the product met the criteria of very feasible with a score of 92,50 and teacher C responded to the module to very feasible category with a percentage score of 97,50. The average response results from 56 students of class IV at SDNM1 gave the module a very feasible assessment with a percentage score of 89,17. The *Mandiri* phase is the phase that students are most interested in because of the real action in carrying out contextual projects such as making fruit salad and selling *Sawut Singkong* during break times.

The result of the research that has been carried out show that the innovation of the MPATM-based scientific literacy collection module integrated by edupreneurship has proven to be valid and effective in increasing the independence of elementary school students. This also supported by research conducted which shows that module development is used as an alternative solution as a learning resource for generation Z students and at the same time is able to foster student independence in learning (Fauzi & Tarigan, 2023; Hapsari et al., 2022). This strengthens research conducted by other studies which said that module learning resources can increase student independence in learning (Gunansyah et al., 2018; Rohmah & Bukhori, 2020).

The formation of independent character in students which increased in this study is based on the principle of acting in making decisions, acting reflectively in facing learning situations. Students show good self-regulation by being responsible, disciplined, self-confident, having initiative when learning, and not giving up easily which can strengthen previous research (Desvian et al., 2021; Rini et al., 2021; Saputri & Mukmin, 2021). Edupreneurship is embedded when students are able to manage time, trying to quickly complete the projects they are working on. Students try to maximize sales of fruit salad and *sawut singkong* which indirectly also hone student's independence and this is also relevant to the research conducted (Aryani & Najwa, 2019; Barba-Sánchez & Atienza-Sahuquillo, 2018; Fithri et al., 2022; Rocha et al., 2022; Widyaningtyas, 2022). The role of the module and the teacher's ability to elaborate on learning is the key to instilling an entrepreneurial spirit. The ability to manage finances, time and social life is a reflection of the positive impact in actualizing independence through the use of the modules developed. It is hoped that these attitudes can be used as provisions for students to adapt to this disruptive era with full independent attitude (Alfatah et al., 2021; Desvian et al., 2021; Kopzhassarova et al., 2016).

The implication of this research include being able to facilitate a variety of learning resources that can increase student's independence and entrepreneurial spirit through a collection of scientific literact modules. The limitation of this research is that there are restrictions on the dimensions of *Pancasila* student profile, namely independence, so the recommendation for further research is to develop a module that is able to improve the six dimensions of the *Pancasila* student profile in order to support the implementation of the independence curriculum (*Kurikulum Merdeka*). The recommendation for further research is to be able to develop learning resources that are able to increase other dimensions of the profile of Pancasila students besides the dimension of independence, such as the dimensions of faith and devotion to God Almighty and noble character, global diversity, mutual cooperation, creativity and critical reasoning.

4. CONCLUSION

This research produces a collection of science literacy modules based on MPATM projects integrated with edupreneurship which have the characteristics of self-instruction, self-contained, stand

alone, adaptive, and user friendly. The module has a selected format, font and size, the attractiveness of the module, the placement of empty space in placing illustrations and images and consistency in the module content adapted for fourth grade elementary school students. The results of product validation obtained a very feasible category. Teachers and students also responded that the module had very feasible criteria with a positive impact on the growth of students' entrepreneurial spirit and increasing students' independent dimensions.

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