Al-Ishlah: Jurnal Pendidikan
Vol.15, 4 (December, 2023), pp. 5573-5582
ISSN: 2087-9490 EISSN: 2597-940X, DOI: 10.35445/alishlah.v15i4.3681

Developing an Integrated Mathematics and Science Module with *Merdeka* Curriculum for Elementary School

Kharisma Eka Putri[1], Mumun Nurmilawati [2], Farida Nurlaila Zunaidah[3]

[1] Universitas Nusantara PGRI Kediri, Indonesia; kharismaputri@unpkediri.ac.id

[2] Universitas Nusantara PGRI Kediri, Indonesia; mumunnurmila68@gmail.com

[3] Universitas Nusantara PGRI Kediri, Indonesia; farida@unpkdr.ac.id

ARTICLE INFO

Keywords:

Module;
MIPA;
Math;
Science

Article history:

Received 2023-03-05
Revised 2023-08-01
Accepted 2023-12-15

ABSTRACT

This study aims to develop mathematics and science modules that is intended for prospective elementary school teacher or PGSD Study Program students, to determine the validity of the STEM teaching modules that have been developed, and to find out the practicality of the STEM modules that have been developed. The method was a research and development model using the 4D development model, including the following Define, Design, Develop, and Disseminate. The tryout was carried out on PGSD UNP Kediri students. The data analysis techniques were qualitative and quantitative, embraced with expert and user validation instruments. The results of this study indicate that the STEM teaching modules developed is stated to be very valid or very good and can be used with a score of 3.62 based on the result of validating the math and science modules. To find out the practicality of the teaching modules, validation was carried out on users and tryout. The result shows that the teaching modules developed can be used with a score of 3.50.

This is an open access article under the CC BY-NC-SA license.

Corresponding Author:
Kharisma Eka Putri
Universitas Nusantara PGRI Kediri, Indonesia; kharismaputri@unpkediri.ac.id

1. INTRODUCTION

The development of a country can be indicated by the leading quality of human resources produced. Indonesia, in terms of the quality of human resources, is still developing quality, as proven by Indonesia's PISA ranking in 2018 reported by OEDC (Hewi & Shaleh, 2020) which only ranks 72 out of a total 78 countries, with the average math score reaching 379 compared to the average score of 487. Furthermore, for science, the average score of Indonesian students reaches 389 with the average score of 489. The score shows that students' ability to think related to mathematics and science is still very low. Despite the improvements in terms of curriculum that currently implements independent learning, the quality of teachers also needs to be considered. One of the improvements that needs to be made is to advance the quality of teachers, especially at the elementary school level.

Elementary school is the level where students begin to think concretely so that the knowledge they gain will become the basis for higher knowledge. In the process of implementing elementary school (SD) or Madrasah Ibtidaiyah (MI) education, the understanding of the cognitive development of elementary age children is vital to be the reference in education and teaching (Bujuri, 2018). This results in teachers in elementary schools needing to have knowledge that is in accordance with their disciplines. This teacher's knowledge is certainly instilled since the in college. The Elementary School Teacher Education Study Program of Universitas Nusantara PGRI Kediri as one of the producers of elementary school student-teacher attempts to improve the quality of its alumni. Elementary School Teacher Education Universitas Nusantara PGRI (PGSD UNP) Kediri has been implementing the Merdeka learning curriculum through teaching activities in schools. When student-teacher learn in the college, of course, they must have sufficient provisions. Not only related to pedagogic skills but also to knowledge of science. One of the disciplines that students need to develop is related to the fields of mathematics and sciences (STEM).

STEM is a disciplines that often presented in practicum and experimental activities where this activity can be such special attractions in classroom learning. Learning through experimental activities or practicum improves critical thinking skills (Primasatya, 2016). Based on (Nurmilawati, 2016), practicum is one of the laboratory activities that contribute vital role in supporting the success of the science teaching and learning process. To facilitate students to be able to carry out experimental or practicum activities, it is necessary to prepare teaching modules that students can use independently and guided. (Prastowo, 2015) states that teaching module are all materials (both information, tools, and texts) that are arranged systematically, which display the complete figure of the competencies that will be mastered by students and used in the learning process with the aim of planning and reviewing learning implementation. This STEM module can be used as teaching module when STEM lab lectures are carried out because it has been systematically compiled, intact (includes objectives, materials, tools, work materials and procedures and analysis questions) and refers to the Merdeka curriculum so as to adjust the needs of elementary school student-teacher in teaching science and mathematics materials in elementary school level.

Science and mathematics are disciplines that deal with concrete and knowable things that can be investigated through experiments and can be proven. Based in (Siagian, 2016) mathematics is one branch of science that has an important role in the development of science and technology, both as a tool in the applications of other fields of science and in the development of mathematics itself. Mathematics is the basis of all sciences, so if one desires to explore science such as physics, then one must study mathematics as well as one wants to master economics. Most importantly according to (Carin, Sund, & Lahkar, 2018)students as prospective teachers are also required to have deeper understanding of concepts, as the understanding of mathematical concepts possessed by prospective teachers will be transferred later to their students. If the knowledge of concepts possessed by the prospective teacher is not comprehensive, it will cause misconceptions when delivered to students.

Meanwhile, based on (Meidawati, 2019) science is a subject that studies events that occur naturally. In addition, science is identical to the application of the scientific method in solving a problem, namely observing, questioning, collecting information from various sources, associating, and communicating the results obtained. Another source (Eka, 2014) stated that the concept of natural learning concern with broad relationship related to human life. Prospectively, STEM module eases prospective elementary school teachers in facilitating experimental activities when teaching elementary school students. Experiments are related not only to science material but also to mathematical material.

One of the most important influencing elements in education is curriculum. Based on (Eka, 2013), curriculum greatly contributes to the development of students' potential quality. So that in the development of teaching module, for example, teaching modules must refer to the latest curriculum in accordance with the needs in the field. In the Merdeka learning curriculum, it strongly supports the development of character, potential and students (Kemendikbudristek, 2022). The Merdeka curriculum has main characteristics, as an improvement from the previous curriculum, namely 1) Project-based

teaching and learning activities are to develop student soft skills and students' character profiles of Pancasila consisting of faith, devotion to God the Almighty, noble character, global diversity, cooperation, creativity, critical reasoning and independence, 2) the concept of learning materials focuses on deepening literacy and numeracy, as one of the basic competencies 3) educators or teachers have the independency to design learning activities that are tailored to the abilities of students and in accordance with the context in local content (Rosmana, Iskandar, Fauziah, Azzifah, & Khamelia, 2022). Nonetheless, in the development of this STEM module, the role of the Merdeka curriculum is manifested in the content standards. Therefore, students of Primary Education Study Program are able to teach elementary school students within the coverage of the Merdeka learning curriculum. Based on this background, it is necessary to design an integrated module for the Merdeka learning curriculum addressed to prospective elementary school teachers.

There is abundant research on developing teaching modules for students. One of which is by (Rini, 2020) who develops elementary school science module for PGSD students of Lambung Mangkurat University. The research merely developed module that focused on the concept of biology. Meanwhile, the teaching module developed in this study discusses the concept of science which includes physics, biology and mathematics. Another research by (Desy Rosmalinda, Risdalina, 2023) formulated electronic module of science practicum using Canva application and flip builder. The module in the research is in the form of software, so that, there is no need to print and duplicate making the module efficient in finance and accessible anywhere and anytime using a mobile phone or laptop. This can be used as input material for STEM module development research that is being formulated. Therefore, the product is not only in the form of printed files, but available in digital, making the module accessible via mobile phones or laptops. Another research by (Subekti, 2018) entitled the Development of Bahasa Indonesia Module with National Character for PGSD Students contains the value of character building. The researcher grasps the idea of inserting the character building, inspired from the research. The advantage of this research is that, during the development of STEM modules, the learning materials for science and mathematics is adjusted with Merdeka curriculum. Therefore, compared to the three studies used as the basis for previous research, the STEM module is in accordance with the needs of the Merdeka curriculum.

In short, this study aims to develop Mathematics and Science or STEM modules intended for prospective elementary school teachers or PGSD Study Program students. This research also aims to find out the validity of STEM teaching modules that have been developed. Lastly, the purpose also covers the practicality or response of STEM modules.

2. METHODS

This research aimed to develop Mathematics and Science or STEM modules intended for prospective elementary school teachers or PGSD Study Program students. The development process included 4 stages as Define, Design, Develop, and Disseminate. Nevertheless, this research was limited to merely the development stage (Mushmin Ibrahim, 2002). The present development was merely intended for our own needs. Thus, the dissemination stage was not carried out.

2.1 Define

This stage of activity focused on analyzing the situation faced by the teacher, student characteristics, concepts to be taught, and ended with learning objectives or learning outcomes. This stage consists of five steps, namely curriculum analysis, student analysis, concept analysis, assignment analysis, and setting learning goals.

2.2 Design

This stage consisted of 3 steps, namely (1) the preparation of benchmark reference tests. The tests were prepared based on the results of the formulation of specific learning objectives. This test was a

measuring tool for changes in behavior in students after teaching and learning activities; (2) selection of media that is suitable for purpose, to deliver subject matter; (3) Format selection.

2.3 Develop

The purpose of this stage was to produce STEM learning modules that have been revised by experts, making them feasible for usage in limited trials. This stage included the validation of learning tools, followed by revisions and limited trials to students. The validation stage according to (Putri, 2015) is a method used to measure the validity of the developed product, named STEM module. This was done by making a validation sheet, in which the contents were in accordance with existing rules and align with the equipment that had been made. Afterward, the validation sheet was sent to validators who were competent in their field of study or learning module experts for assessment.

2.4 Disseminate

This stage was purposed to disseminate teaching module that had gone through the previous stages of validation and trials. Based on Zunaidah & Amin (2016), dissemination can be done in classroom for testing purpose, before external testing. This present research did not conduct the stage of dissemination due to time limitation.

To grasp mutual understanding between the researcher and the reader, it is necessary to explain the operational terms used as follows: 1) the feasibility of developing the module is the result of validation from 2 experts, material experts and teaching module experts, reviewed from the quality of the content and the presentation. This validation is to provide assessment and revision on developed STEM modules. STEM module is considered to be good and worthy of testing, if the average validation results ≥ 2,51(Bungin, 2009). The second operation term used is 2) Practicality is seen from student responses when using STEM teaching modules during lecture activities. In addition, practicality data is also obtained using student response questionnaire sheets. Nonetheless, the data related to student response will be presented by the researcher in the next article.

The tryout design for the STEM teaching module was carried out in several stages. The first stage was assessment by expert in science and mathematics in elementary school and expert in content module development. The second stage was tryout to six 3rd-year university student majoring Elementary Education in Universitas Nusantara PGRI Kediri study year 2022-2023. Revision was done to perfect the module after obtaining the inputs from the validation and tryouts.

The picture below is 4D development flow which consists of four stages, namely defining, designing, developing, and disseminating. Nonetheless, this present research is only limited to the development stage.

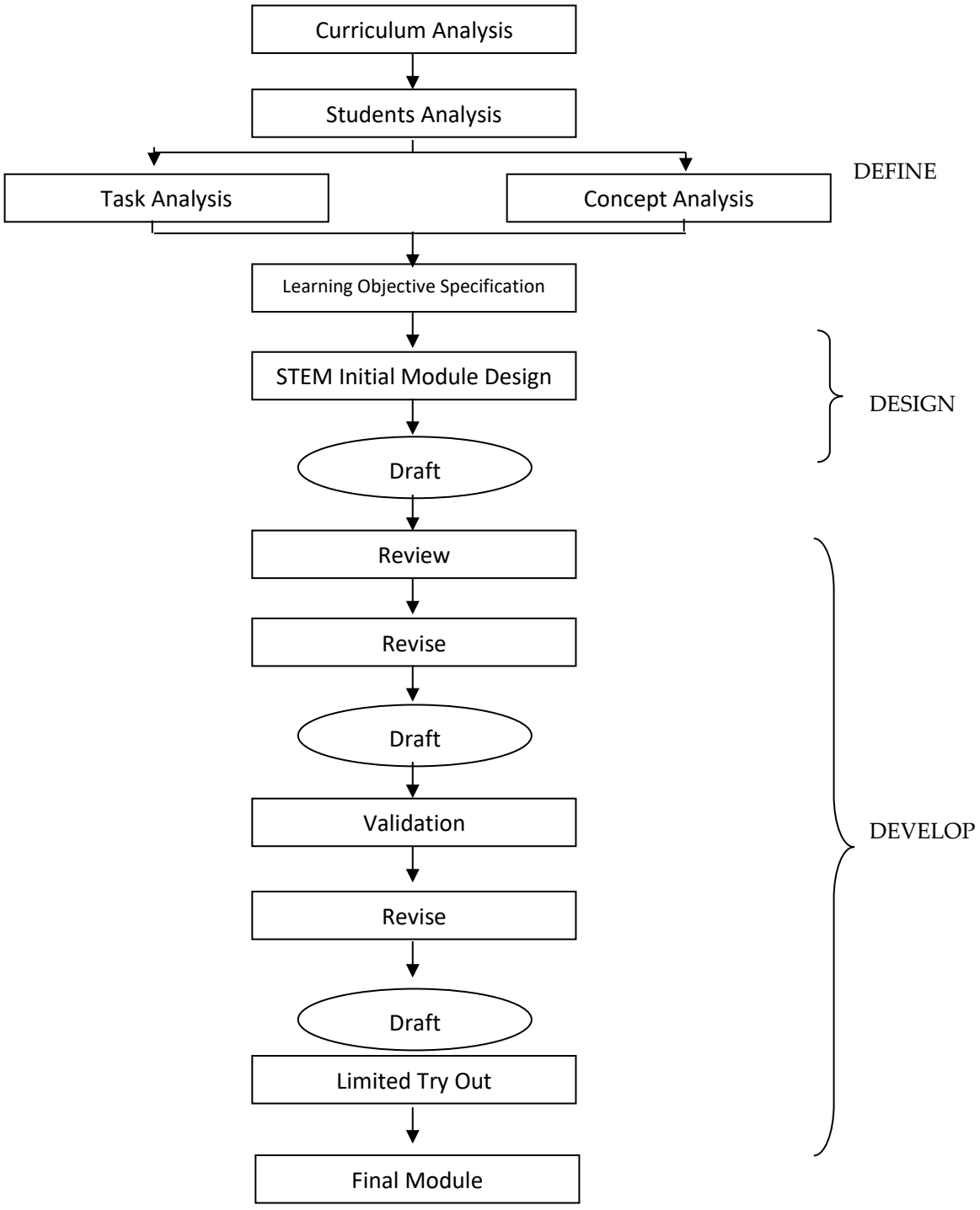


Figure 1. The Dodule Development Model Used Is The 4-D Model (Musimin Ibrahim, 2002)

The instruments used in this study were: validation sheet submitted to experts with the aim of knowing the results of validation carried out by experts on STEM modules that have been made. Data collection techniques in this study were using questionnaire methods, observation methods, and validation methods. The validation method was to measure the validity of the developed module. The observation method was intended to obtain the data on student activities during the use of modules during lectures. Expert validation analysis used questionnaires with a check list (√) model which was

used to assess whether the modules that had been made by researchers were valid with the basic competencies that must be achieved by students. The analysis of expert validation questionnaires used this formula:

$$\text{Validity} = \frac{\Sigma \text{ Total Scores}}{\text{Total Items x Total Responses}}$$

Table 1. Module criteria validation score (Bungin, 2009)

Average Score	Score Criteria
1.00-1.75	Poor Developed
1.76-2.50	Less Developed
2.51-3.25	Good
3.26-4.00	Very Good

3. FINDINGS AND DISCUSSION

3.1 Initial Product Description

The product developed is a teaching module that contains practicum instructions for mathematics and science materials intended for prospective elementary school teacher students. The teaching module is equipped with brief material related to the recent practicum, materials and tools needed, and the steps of activities during practicum along with practice questions that support the understanding of the concept of STEM. The material in the module is in accordance with the learning material for Mathematics and Science Merdeka curriculum in elementary schools. The material presented in the module includes mathematics with the scope of space building material, biology with the scope of digestive system and respiratory system material, physics with the scope of electrical and magnetic materials. In short, the presentation of the material in this module covers mathematics and science.

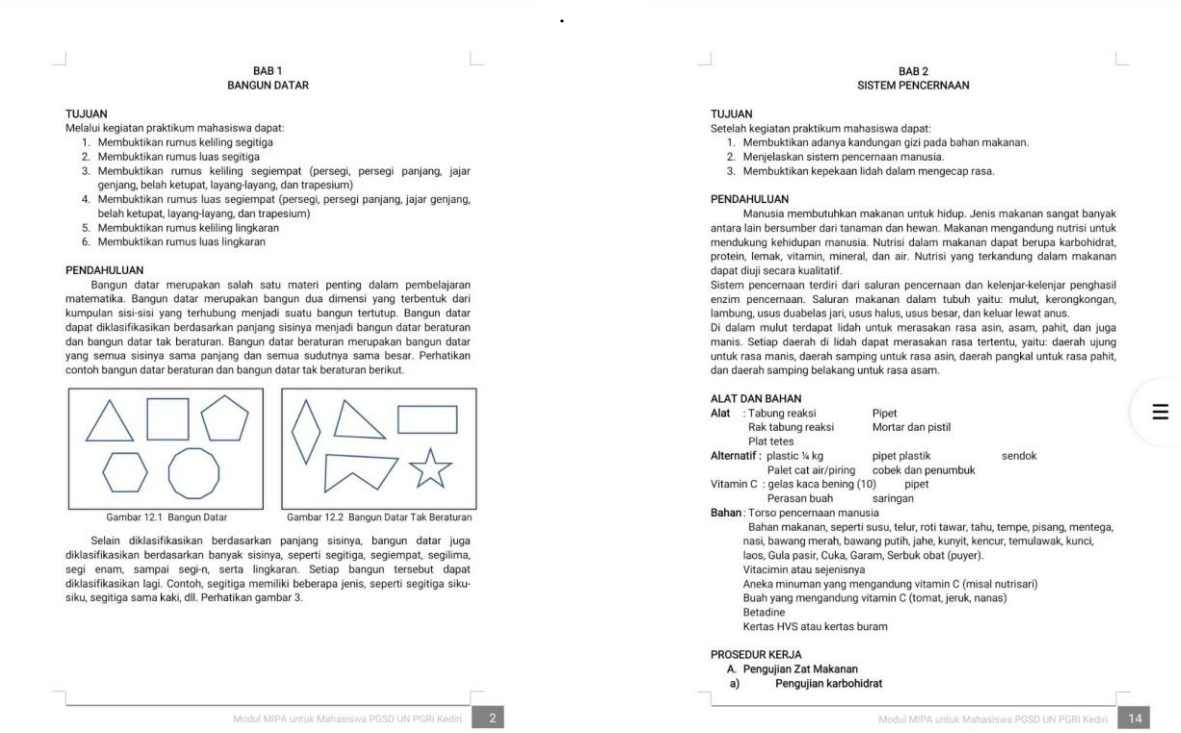
3.2 The Result of Expert Validation and Revisions

After the STEM module was developed, it was then validated by experts in mathematics and science learning. The results of the validation include.

Table 2. Mathematics and Science Expert Validation Result

No.	Aspects	Score
1	Self-instruction Aspect	3.86
2	Self-contained Aspect	4.00
3	Stand Alone Aspect	4.00
4	Adaptive Aspect	3.00
5	User Friendly Aspect	4.00

In accordance with the calculation formula that was previously described, the validation score of mathematics and science material experts is 3.77. The interpretation of the score is very valid, very good and applicable. Meanwhile the comments from mathematics and science material experts contain suggestions concerning the flat space material problem section which previously covered all learning objectives. The next suggestion is that for each experimental activity, students should be asked to draw conclusions from the results of the experiments carried out.



BAB 1
BANGUN DATAR

TUJUAN
Melalui kegiatan praktikum mahasiswa dapat:
1. Membuktikan rumus keliling segitiga
2. Membuktikan rumus luas segitiga
3. Membuktikan rumus keliling segiempat (persegi, persegi panjang, jajar genjang, belah ketupat, layang-layang, dan trapesium)
4. Membuktikan rumus luas segiempat (persegi, persegi panjang, jajar genjang, belah ketupat, layang-layang, dan trapesium)
5. Membuktikan rumus keliling lingkaran
6. Membuktikan rumus luas lingkaran

PENDAHULUAN
Bangun datar merupakan salah satu materi penting dalam pembelajaran matematika. Bangun datar merupakan bangun dua dimensi yang terbentuk dari kumpulan sisi-sisi yang terhubung menjadi suatu bangun tertutup. Bangun datar dapat diklasifikasikan berdasarkan panjang sisinya menjadi bangun datar beraturan dan bangun datar tak beraturan. Bangun datar beraturan merupakan bangun datar yang semua sisinya sama panjang dan semua sudutnya sama besar. Perhatikan contoh bangun datar beraturan dan bangun datar tak beraturan berikut.

Gambar 12.1 Bangun Datar

Gambar 12.2 Bangun Datar Tak Beraturan

Selain diklasifikasikan berdasarkan panjang sisinya, bangun datar juga diklasifikasikan berdasarkan banyak sisinya, seperti segitiga, segiempat, segilima, segi enam, sampai segi-n, serta lingkaran. Setiap bangun tersebut dapat diklasifikasikan lagi. Contoh, segitiga memiliki beberapa jenis, seperti segitiga siku-siku, segitiga sama kaki, dll. Perhatikan gambar 3.

Modul MIPA untuk Mahasiswa PGSD UN PGRI Kediri 2

BAB 2
SISTEM PENCERNAAN

TUJUAN
Setelah kegiatan praktikum mahasiswa dapat:
1. Membuktikan adanya kandungan gizi pada bahan makanan.
2. Menjelaskan sistem pencernaan manusia.
3. Membuktikan kepekaan lidah dalam mengecap rasa.

PENDAHULUAN
Manusia membutuhkan makanan untuk hidup. Jenis makanan sangat banyak antara lain bersumber dari tanaman dan hewan. Makanan mengandung nutrisi untuk mendukung kehidupan manusia. Nutrisi dalam makanan dapat berupa karbohidrat, protein, lemak, vitamin, mineral, dan air. Nutrisi yang terkandung dalam makanan dapat diuji secara kualitatif.
Sistem pencernaan terdiri dari saluran pencernaan dan kelenjar-kelenjar penghasil enzim pencernaan. Saluran makanan dalam tubuh yaitu: mulut, kerongkongan, lambung, usus duabelas jari, usus halus, usus besar, dan keluar lewat anus.
Di dalam mulut terdapat lidah untuk merasakan rasa asin, asam, pahit, dan juga manis. Setiap daerah di lidah dapat merasakan rasa tertentu, yaitu: daerah ujung untuk rasa manis, daerah samping untuk rasa asin, daerah pangkal untuk rasa pahit, dan daerah samping belakang untuk rasa asam.

ALAT DAN BAHAN
Alat : Tabung reaksi Pipet
Rak tabung reaksi Mortar dan pistil
Plat tetes
Alternatif : plastic ¼ kg pipet plastik sendok
Palet cat air/piring cobek dan penumbuk
Vitamin C : gelas kaca bening (10) pipet
Perasan buah saringan
Bahan : Torso pencernaan manusia
Bahan makanan, seperti susu, telur, roti tawar, tahu, tempe, pisang, mentega, nasi, bawang merah, bawang putih, jahe, kunyit, kencur, temulawak, kunci, laos, Gula pasir, Cuka, Garam, Serbuk obat (puyer).
Vitacimin atau sejenisnya
Aneka minuman yang mengandung vitamin C (misal nutrisari)
Buah yang mengandung vitamin C (tomat, jeruk, nanas)
Betadine
Kertas HVS atau kertas buram

PROSEDUR KERJA
A. **Pengujian Zat Makanan**
a) **Pengujian karbohidrat**

Modul MIPA untuk Mahasiswa PGSD UN PGRI Kediri 14

Figure 2. STEM Module

This is the result of the STEM module validation obtained from the expert on content materials, along with the given recommendation.

Table 3. The Result of Expert Content Validation

No.	Aspects	Skor
1	Module Size Aspect	3.00
2	Cover Module Layout	3.62
3	Cover Module Typography	3.50
4	Module Skin Illustration	4.00
5	Content Module Layout	3.08
6	Content Module Typography	3.54
7	Content Module Illustration	3.60

In accordance with the calculation formula previously described, the validation score of teaching module experts is 3.48 based on this score, if converted into a table of criteria for validity and expediency of instruments, it is obtained that the STEM teaching module developed is very good. valid, excellent and practicable. Meanwhile, comments from the experts concern on rewriting of title, subtitle, and bibliography, as well as the layout of the module.

Based on the results of the two validators, namely material experts and teaching module experts, the average validation result of the STEM module is 3.62 which is classified as very good category. The results of this validation are in accordance with research conducted by (Iskandar & Andriyani, 2019). The study obtained validation result of 4.60 with the very good category. The structure of the STEM module developed also aimed to improve students' critical thinking skills. Systematics of the preparation of the content of each material not only contains material and problem-solving problems

but also an advancement by simple practicum activities for each meeting. Thus, it is hoped that at the end of the meeting, students will not only understand the theory but also understand the concepts in the theory.

3.3 The Result of User Validation and Revision

User validation was conducted by asking a lecturer who teaches level III STEM courses at PGSD Study Program of Universitas Nusantara PGRI Kediri to fill out the validation questionnaire. The result is available below.

Table 4. The Result of Content Module Validation

No.	Aspect	Skor
1	Self-instruction Aspect	3.00
2	Self-contained Aspect	4.00
3	Stand Alone Aspect	4.00
4	Adaptive Aspect	3.00
5	User Friendly Aspect	4.00
6	Module Size Aspect	3.00
7	Cover Module Layout	3.00
8	Cover Module Typography	4.00
9	Module Skin Illustration	4.00
10	Module Content Layout	3.00
11	Module Content Typography	4.00
12	Module Content Illustration	3.00

In accordance with the calculation formula described earlier, the score of the module user validation is 3.50. The score represents that the module is very valid, very good and applicable. Meanwhile, comment from teaching module expert is the module inconsistent presentation with its illustration. The use of illustrations serves to illustrate the contents of the module and simultaneously attract the interest of readers. Mulyati (2002) stated that illustrations serve to clarify or concretize information, aid memory and understanding, interest and attention of readers.

3.4 The Result of Limited Tryout and Revision

The limited tryout was conducted on six students of PGSD Study Program FKIP Universitas Nusantara PGRI Kediri. In this limited tryout, there are several notes, including the following:

Table 5. The Result of Expert Module Validation

No.	Name
1	Students tend to skip the instruction on the module.
2	The instructions on the module are difficult to be understood by students. Thus, they need to be revised.

During the tryout process, students tend to pay more attention to the directions given than reading the instructions in the teaching module. Students need to read many times to be able to understand the instructions, this means that it is necessary to formulate more effective instruction sentences so that students can easily understand in doing practicum. In addition to revise the sentence instruction that must be arranged effectively, one of the efforts to make students interested in reading and understanding module is to make the presentation more attractive. Based on (Triana Indrawini, Amirudin, & Widiati, 2017), contrasting colors should be chosen in writing instructions so that the materials are clear and easy to read, resulting ease for readers receiving the messages well. This is supported by Smaldino et al. (2012) that states contrasting color of text and background color makes it easier to read. The results of this limited tryout show that the teaching module developed can be used by students on a limited basis but with some notes for improvement. From the results of limited tryout, it is necessary to revise again to improve the content and presentation of STEM teaching module.

The development of STEM modules is still rarely conducted, especially for students that includes material of science and mathematics. The research by (Samsu, Mustika, Nafaida, & Manurung, 2020) entitled Feasibility Analysis and Practicality of Science Literacy-Based Practicum Modules for Science Learning have several similarities from the preparation of modules that apply practicum activities in every material taught with the present research. The result from the research by (Samsu et al., 2020) stated that the analyzed science practicum module products consisted of three categories with very valid aspect of 78% on the module quality elements, then the practicum module was declared applicable to be used as a practicum guide. The results of the module practicality test on a small scale of student users are 82.8%, classified as very good category in the content aspect. This shows that the modules are arranged systematically and applicable for practicum activities. The module is also able to improve student learning outcomes their critical thinking skills.

4. CONCLUSION

The development of STEM module intended for prospective elementary school teachers or PGSD Study Program students has been validated by material experts, teaching material experts and users. The score for content expert validation is 3.77, from the teaching expert validation is 3.48, and from user validation is 3.50. Those scores represent that the module is very valid, very good, and applicable. There was also small tryout and resulted that students were able to properly use the module. The development of this STEM module can be a stepping stone recommendation for further research and development by other researcher. This research as well can be perfected related to its content to be more beneficial in its applicability.

REFERENCES

Bujuri, D. A. (2018). Analisis Perkembangan Kognitif Anak Usia Dasar dan Implikasinya dalam Kegiatan Belajar Mengajar. *LITERASI (Jurnal Ilmu Pendidikan)*, *9*(1), 37. https://doi.org/10.21927/literasi.2018.9(1).37-50

Bungin, B. (2009). *Penelitian Kualitatif*. Jakarta: Prenada Media Grup.

Carin, A. A., Sund, R. ., & Lahkar, B. K. (2018). ANALISIS KEMAMPUAN PEMAHAMAN KONSEP MATEMATIKA MAHASISWA PGSD STKIP PERSADA KHATULISTIWA SINTANG. *Journal of Controlled Release*, *11*(2), 430–439.

Desy Rosmalinda, Risdalina, I. S. (2023). Pengembangan Modul Elektronik Praktikum IPA Menggunakan Aplikasi Canva Dan Flip Builder. *Jurnal Pendidikan Dasar*, *08*.

Eka, K. (2013). PENGEMBANGAN BUKU SISWA TERPADU TIPE JARINGAN KERJA TERINTEGRASI PENDEKATAN ILMIAH DI SD KELAS IV. *Paper Knowledge . Toward a Media History of Documents*, *XV*(1), 12–26.

Eka, K. (2014). PENGEMBANGAN PERANGKAT PEMBELAJARAN IPA TERPADU TIPE WEBBED DENGAN TEMA PEMANASAN GLOBAL UNTUK KELAS VIII SMP NEGERI 28 SURABAYA. *Jurnal Pendidikan Sains (Jps)*, *6*(1), 5. https://doi.org/10.26714/jps.6.1.2018.5-13

Hewi, L., & Shaleh, M. (2020). Refleksi Hasil PISA (The Programme For International Student Assesment): Upaya Perbaikan Bertumpu Pada Pendidikan Anak Usia Dini). *Jurnal Golden Age*, *4*(01), 30–41. https://doi.org/10.29408/jga.v4i01.2018

Ibrahim, Mushmin. (2002). *Pengembangan Perangkat Pembelajaran*. Jakarta: Dirjen Dikdasmen Depdiknas.

Ibrahim, Musimin. (2002). *Pelatihan Terintegrasi Berbasis Kompetensi Guru Mata Pelajaran Biologi Pengembangan Perangkat Pembelajaran*. Jakarta: Departemen Pendidikan Nasional.

Iskandar, R. S. F., & Andriyani, R. (2019). Pengembangan bahan ajar trigonometri untuk meningkatkan kemampuan berpikir kritis matematis mahasiswa. *PRISMA, Prosiding Seminar Nasional Matematika*, *2*, 759–763.

Kemendikbudristek. (2022). *Perbandingan kurikulum. Retrieved from Pusat Kurikulum dan Pembelajaran*.

Meidawati, S. A. N. B. R. (2019). Persepsi Siswa Dalam Studi Pengaruh Daring Learning Terhadap Minat Belajar Ipa. *SCAFFOLDING: Jurnal Pendidikan Islam Dan Multikulturalisme*, *1*(2), 30–38. https://doi.org/10.37680/scaffolding.v1i2.117

MULYATI, Y. (2002). *POKOK-POKOK PIKIRAN TENTANG PENULISAN MODUL BAHAN AJAR DAN DIKLAT*. Jakarta: UPI.

Nurmilawati, M. (2016). *Profil Hasil Belajar Mata Kuliah Laboratorium IPA Mahasiswa Program Studi PGSD di UN PGRI Kediri Beserta Kendala Pembelajarannya*. 244–247.

Prastowo, A. (2015). *Panduan Kreatif Membuat Bahan Ajar Inovatif*. Yogyakarta: DIVA Press.

Primasatya, N. (2016). Analisis Kemampuan Berpikir Matematis Calon Guru Sekolah Dasar Dalam Menyelesaikan Masalah Matematika. *JPM : Jurnal Pendidikan Matematika*, *2*(1), 50. https://doi.org/10.33474/jpm.v2i1.206

Rini, T. P. W. (2020). Pengembangan Bahan Ajar Ipa Sekolah Dasar I Bagi Mahasiswa Pgsd Universitas Lambung Mangkurat. *Jurnal IKA PGSD (Ikatan Alumni PGSD) UNARS*, *8*(1), 209. https://doi.org/10.36841/pgsdunars.v8i1.599

Rosmana, P. S., Iskandar, S., Fauziah, H., Azzifah, N., & Khamelia, W. (2022). Kebebasan dalam Kurikulum Prototype. *As-Sabiqun*, *4*(1), 115–131. https://doi.org/10.36088/assabiqun.v4i1.1683

Samsu, N., Mustika, D., Nafaida, R., & Manurung, N. (2020). Analisis Kelayakan Dan Kepraktisan Modul Praktikum Berbasis Literasi Sains Untuk Pembelajaran IPA. *JIPI (Jurnal IPA Dan Pembelajaran IPA)*, *4*(1), 29–40. https://doi.org/https://doi.org/10.24815/jipi.v4i1.15546

Siagian, M. D. (2016). Kemampuan koneksi matematik dalam pembelajaran matematika. *MES: Journal of Matematics Education and Science2*, *2*(1), 58–67.

Smaldino, S. E., Lowther, D. L., & Mims, C. (2012). Instructional Media and Technology for Learning. In *International Journal of Distributed and Parallel Systems* (Vol. 3).

Subekti, T. (2018). Pengembangan Modul Bahasa Indonesia Bermuatan Nilai Karakter Kebangsaan Bagi Mahasiswa Pgsd. *Profesi Pendidikan Dasar*, *3*(2), 88. https://doi.org/10.23917/ppd.v3i2.2746

Triana Indrawini, Amirudin, A., & Widiati, U. (2017). Pengembangan bahan ajar tematik —1400 subtema ayo cintai lingkungan untuk siswa kelas iv sd. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, *2*(11), 1489–1497.