The development of physics modules based on madihin culture to train kayuh baimbai character

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Abstract. The unavailability of the physics module containing local wisdom of South Kalimantan and can trace the character become the background of this research. Therefore, the researcher conducted research and development of physics module on subject vibration, waves, and sounds of madihin culture to train kayuh baimbai character. This study aimed to describe the feasibility of physics modules based on the validity, practicality, effectiveness, and achievement of kayuh baimbai. This study was a research and development used ADDIE model. Subjects tested for this research were class VIII-H MTsN 3 Banjarmasin intended for 32 people. Validation data are obtained from the module validation sheet, the practicality of the student response questionnaire, the effectiveness of the learning outcome test and the character achievement of the character assessment sheet. The result of the research showed that: (1) the validity of physics modules was categorized as valid, (2) the practicality of physics module was categorized as highly practical, (3) the effectiveness of the physics module was categorized as moderate, and (4) the achievement of kayuh baimbai characters was categorized as good. The conclusion is that the physics module based on madihin culture is feasible to use in learning.

1. Introduction
Education aims to create people with quality and character who can have a broad view of achieving the expected goals and ability to adapt quickly and precisely to the environment. Character building is needed in the learning process that aims to actualize the goal of education in Indonesia. This goal can be achieved by local wisdom based learning. Cultural aspects of science learning and curriculum with local wisdom and culture-based, cultural backgrounds affect the process of student learning in schools [1]. In addition, learning in schools should provide and support optimally to maintain and develop local wisdom [2]. Studying science based on local wisdom can enhance students' ability to investigate and explain the scientific knowledge behind the local wisdom [3]. Through local wisdom-based learning, the cultural values / characters present in local communities can be passed on to generations [4]. Through the application of local wisdom of the learning process can train the character of students.

Based on interviews for science teachers of MTsN 3 Banjarmasin can be found that students have difficulty in understanding the contents of the learning module because the module used is considered less communicative. The learning module used in the school does not contain many examples of questions, and also the material described in the module is still lacking. Therefore, students have to look for other learning resources. Moreover, there is no local wisdom based learning module that can
train students’ characters. In the process of learning and teaching, the teacher does not pay attention to the importance of students’ character training.

Based on those existing problems of the school, the researchers create a learning module that contains local wisdom which teaches character of the students. The development of the module based on local wisdom is suitable not only to increase the pride in local culture but also to create students’ character. The local wisdom chosen in this study is madihin culture. Madihin culture is one of the growing cultures in Banjarmasin community. Playing musical instruments of madihin required cooperation between the madihin. This is compatible with the community motto of Banjarmasin, “kayuh baimbai” which in Indonesian means kerjasama or cooperation.

The local wisdom based physics learning is expected to motivate students in learning so that students' mastery of physics material becomes better. In addition, local characters can also be trained for students through the application of local wisdom of physics learning. This is supported by the research about the development of the physics module based on local wisdom of Hulu Sungai Selatan to trace the character of rakauf mufakat [5]. The result showed that the use of local wisdom-based physics module is effective in the learning process in terms of students learning outcomes. Research about the development of the physics module based on local wisdom South Kalimantan to trace the character of waja sampai kaputing [6]. The application physics module can also trace the character of waja sampai kaputing. In addition, research about the development of physics teaching materials based on local wisdom to train saraba kawa character [7]. The result showed that physics learning based on local wisdom could build the knowledge and character of students.

Based on the problems of, research was conducted on the development of physics modules on vibration materials, waves and sounds contained madihin culture to train the character of “kayuh baimbai.” The purpose of this study is to describe the feasibility of physics module contained madihin culture to train kayuh baimbai character of the material of vibration, wave, and sound. The specific objectives of this research are to describe: the validity of the module, the practicality of the module, the effectiveness of the module, and the achievement of kayuh baimbai characters.

2. Method

This research was development research. The development model used was ADDIE (Analyze, Design, Development, Implementation, and Evaluation) model [8]. The development flow used can be seen in Figure 1 below.

![Figure 1. Steps of development using the ADDIE model](image_url)
In this research, the product developed is a physics module on vibration, waves, and sounds materials that contain madihin culture to train kayuh baimbai character. This research was conducted in MTsN 3 Banjarmasin which is located at Jl. Bhakti Rt. 32 No. 04, Pemurus Dalam district, Banjarmasin city. Subjects tested for this research were class VIII-H MTsN 3 Banjarmasin intended for 32 people.

The research instruments used to include: 1) validation sheets to assess validation which assessed by validators who are academics and practitioners [7], 2) student response questionnaires to measure the practicality of the module developed [9], 3) students' cognitive learning outcomes to measure the effectiveness of the use of the developed module; and 4) observation sheets to determine kayuh baimbai character observed by the observer.

The validation module is based on the validation expert [10] which consists of 2 validator academics and 1 validator practitioners. The results of module validation from the observer are analyzed and compared with validity criteria that have been determined [11]. Module practicality result data can be obtained based on students' responses to the module usage — the criteria of practicality (Adapted from [11]). The effectiveness of learning outcomes can be measured from the results of pretest and posttest. Equation 1 below is used to measure the effectiveness of student learning outcomes [12]. Kayuh Baimbai character observed by 2 observers during the learning process. The result of the average score obtained from the observation sheet was adjusted to the student achievement criteria of the desired kayuh baimbai character [13].

3. Result and Discussion

3.1. The Product of Research and Development

The developed physics module was a module on vibration, waves, and sounds materials contained madihin culture. The module, which is based on local wisdom of the material vibration, waves and sound consists of a cover page, preface, table of contents, an introduction includes (hint use of modules, basic competency standards and indicators), introduction to culture madihin, concept maps, chapter titles, description of materials, summary, competency test, character reflection, character corner, bibliography, glossary and key competency test answers).

This research applied local wisdom, madihin culture, and kayuh baimbai characters. Madihin is one of the growing traditional arts in South Kalimantan. Madihin is a well-known form of literature which is a popular Banjar cultural asset that needs to be introduced, built, and developed in society [14]. Kayuh baimbai (cooperation) is a denotative meaning of the Banjarmasin City motto. In Bahasa Indonesia kayuh baimbai means mengayuh bersama (rowing together). The use of the term "Kayuh" is closely related to the area of Banjarmasin city which has the nickname “the city of thousand rivers.” Life of Banjarmasin people in the past closely related to the helping of rivers so that people can easily interact [15].

3.2. Validation of Module

Validation results from the developed physics module on vibration, waves, and sounds materials contained madihin culture to train kayuh baimbai character is shown in Table 1.

| Table 1. Validation Result of Module |
|-------------------------------------|
| **Content Aspect of Assessment**    | **Mean** | **Appearance Aspect of Assessment** | **Mean** |
| Content quality                    | 3.20     | Consistency                          | 3.33     |
| Organization                       | 3.00     | Format                               | 3.00     |
| Language                          | 3.00     | Attractiveness                       | 3.33     |
| Evaluation                        | 3.17     | Font type and size                   | 3.22     |
| Validation                        | 78.24%   | Language                             | 3.00     |
| Category                          | Valid    | Validation                           | 80.77%   |
|                                    |          | Category                             | Valid    |
The results of the validation modules, students could be seen based on two aspects: the content and appearance. Aspects of the content module consist of the quality aspects of content, organization, language, and evaluation. Results obtained validation of the contents of the percentage of 78.24 with a valid category. Validation displays modules, including consistency, format, appeal, shape, and size of letters, as well as linguistics. The display validation results obtained by percentage of 80.77 with a valid category level. Module with a valid validation level had been said to be tested [16], as well as a decent used to support the learning process [17]. By using the module learners could learn independently with guidance by educators [18].

3.3. Practicality of Module

The practicality of the developed module could be seen from the student response questionnaire [19]. The results of the analysis of the practicality obtained could be seen in Table 2.

| Table 2. Analysis results of student response questionnaire |
|------------------------------------------------------------|
| Indicator                        | Mean  | Category          |
|----------------------------------|-------|-------------------|
| Easiness of use                  | 3.47  | Highly practical  |
| Benefit                          | 3.41  | Highly Practical  |
| Learning time efficiency         | 3.41  | Highly Practical  |
| Mean                             | 3.43  | Highly Practical  |

In Table 2, each indicator of the practicality of the module has a highly practical category. This shows that the developed module well implemented. This proves that this module could improve student motivation, help students to have a better understanding of teaching materials, questions, and competence tests presented could be a benchmark of students' understanding of the existing material in the module. Moreover, it could facilitate students in learning the material and could be used independently or in groups and could help facilitate the teacher in delivering the material, therefore that the learning time becomes more efficient. A product could be said to be practical if the product could be used [20]. By using the module then learners could learn independently with guidance by educators. Science models based on local wisdom lead learners to observe or observe directly and deeply in their neighborhoods. This was very appropriate to deepen the concepts of Science [21]. The existence of additional information compiled in the module is the provision of information to increase the knowledge of students, especially those concerning the potential for South Kalimantan region. This was done to increase students' curiosity about their own areas and the source of student motivation to learn [22].

3.4. Effectiveness of Module

The effectiveness of the module was measured through student learning outcomes. The effectiveness of the module developed could be seen in Table 3.

| Table 3. Result of students learning outcomes |
|-----------------------------------------------|
| Mean of Pretest | Mean of Posttest | N-gain   |
|-----------------|------------------|----------|
| 29.44           | 66.14            | 0.60     |

Based on Table 3, it was obtained the value of g 0.60 with moderate effectiveness. The effectiveness of learning can be measured by the attainment of the goals obtained after the learning process. According to [23], based on this theory, the developed module was effective because it could meet effectiveness aspects of a module. It was effective against improving student learning outcomes, evident from an increase in pretest and posttest values [24]. Scientific learning based on local wisdom encourages students to construct and make connections between acquired knowledge and the reality that is around students [25]. So that students could feel directly the facts or phenomena that occur and could relate to the knowledge gained. This makes the learning process meaningful, so the subject
matter was easy to remember by the students. This is supported by the research results about modules based on local wisdom could improve learning outcomes of students [5]. Thus, the modules are developed effectively used because it could improve student learning outcomes and easily understood by students.

3.5. Attainment of Kayuh Baimbai Character

The attainment aspect of kayuh baimbai character was measured using an observation sheet [26] by two observers. The indicators of kayuh baimbai in this study include the cooperation of reaching goals, concerning the feelings of others, motivating others, and helping friends. The results of student character attainment were obtained by calculating the average score of attainment of each meeting. The results could be seen in Table 4.

| Character         | Meeting | Mean   | Percentage | Category |
|-------------------|---------|--------|------------|----------|
| Kayuh             | I       | 3.37   | 81.00%     | Good     |
| Baimbai/Cooporation | II      | 3.25   | 81.45%     | Good     |
|                  | III     | 3.20   | 83.00%     | Good     |
| Average           |         | 3.27   | 81.81%     | Good     |

Based on Table 4, it was obtained that the average percentage was 81.81 with a good category. Thus, the module developed able to trace the character of kayuh baimbai to the students; this was because, in the learning process, indicators to be achieved could be achieved. This is supported by several research results which state that the module based on local wisdom can be integrated with character education [27], and used to develop character [28, 29, 30] and build the character of student to fit the cultural values [31].

4. Conclusion

Based on the results of development and testing, it can be concluded that the module on vibration, waves, and sounds materials contained cultures madihin is feasible. This can be seen from 1) the validity of the module developed which was categorized as valid, 2) the practicality of the module which was categorized as highly practical, 3) the effectiveness of the which was categorized as moderate, and 4) the attainment of kayuh baimbai character is categorized as good.

References

[1] Sulistyo ET, Prayitno BA, Pratama H 2014 J. Pendidik. Fis. Indones. 10 15
[2] Parmin P, Sajidan S, Ashadi A, Sutikno S 2015 J. Pendidik. IPA Indones. 4
[3] Yuenyong C 2018 Glob. Stud. Child. 3 86
[4] Ambarini R, Setyaji A, Suneki S 2018 English Lang. Teach. 11 8
[5] Wati M, Hartini S, Misbah M, Resy R 2017 J. Inov. Pembelajaran Fis. 4 157
[6] Hartini S, Misbah M, Helda H, Dewantara D 2017 In: AIP Conference Proceedings 2017 1
[7] Hartini S, Firdausi S, Misbah M, Sulaeman N F 2018 J. Pendidik. IPA Indones. 7 130
[8] Nadiyah R S, Faaizah S 2015 Procedia Soc. Behav. Sci. 195 1803
[9] Setiyadi M W 2017 J. Educ. Sci. Technol. 3 102
[10] Husen M, Martawijaya M A, Haris A 2016 In: Proceeding International Conference on Mathematics, Science, Technology, Education and their Applications 171
[11] Akbar S 2016 Instrumen perangkat pembelajaran (Bandung: PT Rosdakarya).
[12] Hake R R 1998 Am. J. Phys. 1 64
[13] Widoyoko S E P 2009 Evaluasi program pembelajaran (Yogyakarta: Pustaka Pelajar).
[14] Faridah S 2016 in Seminar Nasional Pergerakan Sastra Indonesia di Eropa dan Implementasi Pendidikan di. Indonesia 20
[15] Wattimena RA 2009 Melintas. 25 227
[16] Oktaviana D, Hartini S, Misbah M 2017 Berk. Ilm. Pendidik. Fis. 5 272
[17] Misbah M, Dewantara D, Hasan S M, Annur S 2018 Unnes Sci. Educ. J. 7 19
[18] Prastowo A 2011 Panduan kreatif membuat bahan ajar inovatif (Yogyakarta: Diva Press).
[19] Shinta RN 2014 Mimb. Sekol. Dasar. 1 142
[20] Mahyuddin RS, Wati M, Misbah M 2017 Berk. Ilm. Pendidik. Fis. 5 229
[21] Khusniati M 2014 Indones. J. Conserv. 3
[22] Parwati N N 2015 JPI (J. Pendidik. Indones.) 4
[23] Batoq I, Susila I W, Rijanto T 2015 Pendidik. Vokasi. Teor. Prakt. 3117
[24] Yuliono SN, Sarwanto S, Cari C 2018 J. Educ. Learn. 12 137
[25] Setiawan B, Innatesari DK, Sabtiawan WB, Sudarmin S 2017 J. Pendidik. IPA Indones. 6 49
[26] Izzati N, Hindarto N, Pamela Sari D 2013 J. Pendidik. IPA Indones. 2 183
[27] Sugiyono R, Purwastuti L A 2017 Sino-US English Teach. 14 299
[28] Mannan M N 2016 J. Inov. Pembelajaran. Fis. 2 141
[29] Hartini S, Isnanda M F, Wati M, Misbah M, An’nur S, Mahtari S 2018 8 J. Phys. Conf. Ser. 1088
[30] Wati M, Hartini S, Lestari N, An’nur Sand Misbah M 2019 Int. J. Recent. Technol. 7
[31] Ruyadi Y 2010 In: Proceedings of the 4th International Conference on Teacher Education 132 577