Developing a Physics Module Integrated with the Local Wisdom of Baayun Maulid to Build Wasaka Character

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Abstract - This study was carried out due to the absence of physics learning module, with the material of harmonic vibration, integrated with the local wisdom of baayunmaulid that can build wasaka character. This study aims to describe the feasibility of the physics learning module developed based on the aspects of validity, effectiveness, and practicality. This study used the ADDIE development model. The subjects in this study were 36 students of class X MIPA 3 at SMAN 6 Banjarmasin. The data of this study was obtained by module validation sheet, learning outcome validation sheet, lesson plan implementation sheet, and learning outcome tests. The data were analyzed using quantitative and qualitative analysis techniques. The results of the study show that: (1) the validity of the module based on the validation sheet thoroughly is in the valid category; (2) the practicality of the module based on the lesson plan implementation sheet is in the practical category; and (3) the effectiveness of the module based on the scores of learning outcome tests is in the medium category. From these results, it can be concluded that the physics module, with the material of harmonic vibration, integrated with the local wisdom of BaayunMaulid is worth using in the learning process.

Index terms— local wisdom, baayun maulid, wasaka.

I. INTRODUCTION

Science learning aims to enable students to obtain and develop their competence by focusing on direct experiences in understanding and exploring natural surroundings scientifically [1]. To make the learning material is more effectively understood by students, local wisdom is incorporated in the learning. One of the science subjects namely physics learning can be meaningful for students when the physics material is associated with the local wisdom available in that particular area [2]. In addition, integrating the local wisdom into the learning process can help build the students' character[3][4].

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Based on the results of the observation, it was found that the learning source used was the teaching materials issued by the publishers, namely the textbooks. The teaching materials issued by the publishers did not contain the local wisdom of the area because in general the teaching materials issued by the publishers were distributed and used for national scale, not just for certain areas. Besides, the limitation on the number of textbooks that the students can use also became the obstacle. Therefore, the process of character building had not been maximized in the learning process.

A solution that can be used to overcome the abovementioned problems is to develop a teaching material that integrates the local wisdom into physics learning material and is able to build the students' character. One of the forms of teaching material is a module. The module is a teaching material that is arranged systematically with the language that is easily understood by the students according to the level of knowledge and the age of the students so that they can learn by themselves (independently) with minimal assistance or guidance from teachers [5]. [3] The use of a physics module integrated with the local wisdom is effective in the learning process [3]. The module integrated with the local wisdom is packaged thoroughly and in a systematic wayto increase the students' learning motivation and create more meaningful learning since the examples of phenomena inserted can be found in the surrounding environment.

There is a lot of local wisdom available in South Kalimantan such as floating market, *sasirangan*, *lala* oil, and*baayunmaulid*. With the local wisdom availabe in South Kalimantan, not only can the culture of Banjar people be learned, but physics can also be learned. As in *baayunmaulid*, one of the physics materials namely harmonic vibrationcan be learned. Besides, the other local wisdom that is a *wasaka* character (*wajasampaikaputing*) can be built. The indicator of *wasaka*is hard work and responsibility. This character value is very important to achieve the learning objectives [6].

Based on the explanation above, the researchers got interested in conducting a study on developing a physics module, with the material of harmonic vibration, integrated with the local wisdom of *baayunmaulid* to build *wasaka* character.

The purpose of this study is to describe the feasibility of the physics module, with the material of harmonic vibration, integrated with the local wisdom of *baayunmaulid* to build *wasaka* character.

II. METHOD

The product developed in this study was the physics module integrated with local wisdomof *baayunmaulid*tobuildstudents'*wasaka* character. In this study, the ADDIE model was usedto develop the module. The steps wereanalyzing, designing, developing, implementing, andevaluating to describe the feasibility of themodule that can build students' character.

Thirty-six tenth grade senior high school students at Senior high school no 6 Banjarmasin were the samples of this study. Furthermore, the object of the study was the feasibility of a physics module integrated with local wisdom, *baayunmaulid,*to build students *wasaka* characters. Data collection techniques in this study included several types of validation sheets. First, module validation sheet was to determine the level of module validity seen from the suitability of the module with the theoretical foundation of its development which was assessed by three validators, two academic validators,and one practitioner validator. Second, the validation sheet for implementation of the lesson plan to measure the practicality of the module whichwas done by two observers.They used observation sheets consisting of the syntax of guided inquiry learning models, and learning outcomes test to measure the effectiveness of modules by using a pretest before and after the learning using a developed module.

The module isvalid if the assessment has met certain criteria[7].The percentage results that have been obtained were then compared with the validation criteria to find out whether the module is valid or not.

The practicality of the module can be seen from the learning implementation sheet by using a guided inquiry learning model conducted by two observers. Thisis supported by the statement [8] of the practicality of the module developed based on the implementation of the lesson plan viewed from whether the teacher can carry out the learning according to the lesson plan that has been made or not. It was done through classroom observation during the teaching and learning process. The implementation of the lesson plan was calculatedand then compared to the assessment criteria for the implementation of the lesson plan [9].

The effectiveness of the module was measured by using assessment results of learning outcome in the form of pretest and posttest. [3] states that the effectiveness of the module can be seen from the components of student activities, responses, and learning outcomes. The effectiveness of the module was analyzed with the Normalized gain (N-gain) equation and then compared to the effectiveness criteria [10].

III. RESULTS AND DISCUSSION

The product produced in this Research and Development (R&D) study was a physics module for senior high school students in class X, with the material of harmonic vibration, integrated with the local wisdom of *baayunmaulid* to build the students' *wasaka* character. The basis of the integration of the local wisdom of *baayunmaulid* into the material of harmonic vibration is that at the event of *baayunmaulid* the participants are swayed when the reciting of *maulid* verse is carried out in a state of standing which aims to obtain blessing from the celebration of the Prophet Muhammad's birthday [11]. The swing

motion suits the characteristics of harmonic vibration. The module developed was adjusted to the characteristics of the material of harmonic vibration and the characteristics of the students in class X MIPA 3 of SMA Negeri 6 Banjarmasin.

A. The product developed

The features of the module developed can be seen in Table 1.

TABLE I. THE FEATURES OF THE MODULE DEVELOPED

TABLE I.

No.	The features of the module
1.	The material of harmonic vibration contained in the module is split into three learning activities, and in each learning activity there is the material of harmonic vibration associated with the local wisdom of *baayun maulid.*
2.	The module is equipped with LKPD that can help build the students' *wasaka* character during their learning using the guided inquiry learning model integrated with the local wisdom of *baayun maulid.*
3.	The module is equipped with cultural info that contains the explanation of *baayun maulid.*
4.	The module is equipped with technology information related to the material of harmonic vibration.
5.	The module is equipped with physics corners to make it easy for the students to memorize formulas.
6.	The module developed contains quotations from various sources to complement the teaching material and to enhance the students' insight about the local wisdom of *baayun maulid.*

The example of physics modules developed to integrate local wisdom, *baayunmaulid*, to build students character can be seen in Figure 1.

Fig. 1.   Informationabout Baayun Maulid

B. Validity of Module

The module validation can be seen from the content validation and display validation that was assessed by three validators, two academic validators,and one practitioner validator. Content validation consisted of four aspects of assessment, namely the quality of content, organization, language, and evaluation. It isin accordance with[2]'s statement which states that the content validation of a module consists of some aspects which are assessment of quality, organization, language, and evaluation. The results revealed the level of validation and reliability of the

contents of the module. It is seen in Table 2.

Table II. The Result of ContentValidation

Assessments Aspects	Percentage (%)	Category
Content quality	77	Valid
Organisation	83	Valid
Language	79	Valid
Evaluation	83	Valid
Validation	**79**	**Valid**

In addition, display validation consisted of five aspects of assessment, namely consistency, format, attractiveness, form,and size of letters, and language. It is also in line with Daryanto who states that regarding display, those five crucial elements must be taken into consideration [2]. Based on the results, level of validation and reliability of the module display are revealed as it is shown in Table III.

TABLE III. RESULT OF DISPLAY VALIDATION

Assessments Aspects	Percentage (%)	Category
Consistency	92	Very Valid
Format	79	Valid
Attractiveness	89	Very Valid
Form and size of letters	97	Very Valid
Language	100	Very Valid
Overall Validation	91	Very Valid

The overall results of module validation on content, 79%, can be categorized as valid and results on display validation, 91%, can be categorized as very valid. It means that the module can be used after minor revisions. Moreover, the module has met the evaluation criteria both regarding module content and module display. Thisresult shows that the module developed can be used in the next stage.

C. **The practicality of Module**

In this study, the practicality of the module was measured based on the observation sheet on the implementation of the lesson plan observed by two observers during the learning process. It is supported by [8] who states that practicality can be reviewed in the implementation of learning conducted by the teacher during the process of teaching and learning activities. The results of the module practicality analysis can be seen in Table IV.

TABLE IV.THE PRACTICALITY OF THE MODULE

Phase	Meeting 1	Meeting 2	Meeting 3
	Average	Average	Average
Introduction	3.7	2.8	4
Identification of problem	3.9	2.9	3.5
Collecting Data	3.8	3.3	4
Analyzing Data	3.5	4	4
Justification	2.4	3	3.6
Concluding	3	4	4
Closing	2	4	3.8
Score of implementation of lesson plan/ Practicality score	3.4	Practical	
Reliability	0.90	very reliable	

The score of the lesson plan implementation for three meetings was 3.4 categorized in the practical category. Thus, the module is practical to use in the learning process. It is becauseresearchers and students successfully did the steps in learning activities. Hence, the materials were delivered thoroughly, although several stepswere missed due to researchers' errors in the first and second meetings. Also, students were already getting used to learning activities using guided inquiry models and learning to use the developed module; thus, students became more active. It is in line with the results of the study conducted by [2] which showed that the physics module integrated with local wisdom was practical to use in teaching and learning activitiesEfectiveness of the Module

The effectiveness of the module can be found out based on the scores on pretest and posttest which are then calculated through the gain test to get N-gain score. This is supported by [4] who states that the effectiveness of the module can be seen from the components of student activities, student responses, and student learning outcomes. The result of N-gain calculation is shown in Table V.

TABLE V.N GAIN SCORE

Score	N-gain	Category
Average	0.5	Medium

In Table 5, itis seen that N-gain value calculated from the results of pretest and posttest was 0.5 which can be categorized into medium category. It implies that this module is effective to use in the teaching and learning process. This is because the material in the module which is integrated with local wisdom, *BaayunMaulid,* makes the module more interesting and more motivating for some students to learn.

In line with the opinion of [12], implementing an approach which is integrated with local wisdom in the teaching and learning process can be helpful to provide contextual and meaningful learning for students, so they are more motivated to learn. The physics module is effective to use in the learning process because it can improve students' learning outcomes [13]. This result is in line with the results of a study conducted by [2], the physics module integrated with local wisdom can motivate students to learn to achieve the learning objectives.

This moduleis adapted to students' characteristics and needs, and the language is easily understood that makes it helpful for students to study both independently and with teacher guidance. As it is stated by [14], the development of module aims to help facilitate students to understand

physical material to achieve the competencies that have been set.

Moreover, this module was developed from various learning sources to supplement the teaching materials that is incomplete and provide insightful knowledge to students about *baayunmaulid*.In addition, this module broadens students' knowledge on technologyrelated to harmonic vibration. Besides, this moduleis also equipped with more examples that support the explanation of the material and practice questions and competency tests. It is also in line with the results of the study conducted by [3] which showed that the use of physics module integrated with local wisdom, that is making lala oil, was effective in the teaching and learning process.

IV. CONCLUSIONS

Physics moduleintegrated into local wisdom of*baayunmaulid*to build*wasaka*character is suitable to use. It is supported by some factors. First, regardingthe validity, this module is categorized valid. It merely needs minor revision based on the feedbacks of the validators written in validation sheets. Second, the practicality of the module is measured by the implementation of the lesson plan which is in the practical category. Besides, in terms of the effectiveness which is measured from calculated pretest and posttest score to get N gain, it was revealed that the N gain is in the medium category.

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