Validity and practicality of IPA textbook integrated the theme of a hurricane with the type of shared inquiry-based training

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Abstract. The purpose of this research is to produce an integrated theme of science (IPA) textbooks a hurricane with a type of shared inquiry based on a valid and practical training. This research is research development by using a model with a preliminary research stage pump, Prototyping Phase, and Assessment Phase. IPA textbook integrated the theme of a hurricane with the type-based model of shared inquiry this training developed by the five validators consisting of experts or an expert practitioner and two people. For the practicalities of IPA, textbook integrated the theme of a hurricane with the type-based model of shared inquiry this training rated by teachers as practitioners and learners Class VII SMP 4 Padang. Validity of data analysis techniques using the formula valid category with Aiken's ≥ 0.6. The data obtained from this research is the primary data using the instrument validity and practicalities. The research results were analyzed with descriptive analysis. The results of data validity in research is 0.94 with the category is valid and the practicalities of 88.52% results with the categories are very practical. From the research that has been done that the IPA textbook integrated the theme of a hurricane with the type-based model of shared inquiry training.

1. Introduction
Lessons learned to realize the objectives of National Education require a genuine effort in structuring the educational system as well as in the development of education and the improvement of the curriculum. The curriculum is a tool or guideline and a foundation in the development of education and implementation of learning in order to achieve the goals of the national education itself. This is in accordance with regulation of education and culture minister Number 81A of 2013 on the implementation of the 2013 curriculum which explains that the curriculum is developed in accordance with the characteristics, potential, excellence, local wisdom, and needs / demands of the region.

According to Minister of Education Regulation No. 79 of 2014 on the local curriculum content of 2013 states that educational units containing content and learning process about local potential and uniqueness are intended to form learners' understanding of the superiority and wisdom in their area of residence with the aim of equipping learners with attitude, knowledge, and skills. Learning can take place conductively if the learning environment conditions are safe, comfortable, quiet, away from noise, and avoid the potential or threat of natural disasters, especially hurricanes. Furthermore, the Government's Speech also states that the content of learning materials related to local content in the form of a study of the superiority and wisdom of the area of his residence was formulated through textbooks. Textbooks are a guide and learning tool used in school learning.
According to Ministerial Regulation No. 8 of 2016 textbooks are the main source of learning to achieve basic competencies and core competencies and are declared viable by the Ministry of Education and Culture for use in educational units. The importance of textbooks in learning has not been a serious concern in learning so that the implementation of integrated science learning has not been implemented maximally. Textbooks become a learning resource for learners so as to guide learners in understanding the concept of science. Textbooks have the advantage that there is a lot of information aspects of knowledge, attitudes, and skills for the achievement of competence learners.

Geographically West Sumatra has lowland on the West Coast, as well as the volcanic plateau formed by Bukit Barisan which stretches from Northwest to Southeast with a population density of 112 souls per sq km. West Sumatra coastline entirely in contact with the Indian Ocean along the 375 km. Based on IRBI 2014 data, there is no single area in West Sumatra that is free from the threat of disaster, as well as the city of Padang itself.

Padang city is still prone to typhoon disaster, from data of observation result that knowledge and attitude of disaster response learners about cyclone disaster is still low with percentage of data 61.29%. One of the efforts to gain knowledge of local wisdom or regional potential is to integrate science learning with hurricane material. Integrating science learning with hurricane material is very helpful in achieving knowledge of potential areas for learners. Therefore, the need to develop a worthy textbook in accordance with the feasibility of content, constructs, linguistics, and presentation. Through Preliminary Research the textbooks used in the lessons have not met expectations. Textbooks are expected to have simple and understandable language, scientifically appropriate, and include attitude, knowledge, and skill competencies. The fact is that textbooks have a complex and elusive language that requires high language analysis in understanding them.

The compatibility of textbooks with scientific steps is still less visible because of the existence of an important scientific approach in the curriculum 2013. Furthermore, the suitability of textbooks with SKL includes aspects of attitude and skill in sufficient categories i.e. the available textbooks tend to reveal only aspects of knowledge. Expected textbooks should be able to create interactive relationships between books, learners, and teachers.

Observations have been made on the availability of textbooks in schools where there are some deficiencies found including scientific steps in textbooks still less visible, textbook format is still incomplete, learning objectives have not been detailed, and not preceded by facts so that available textbooks are difficult to understand by learners. This means that existing textbooks need to be revised. Designing and developing a valid and practical textbook requires a preliminary study or in the Plom development model called Preliminary Research. At this stage a preliminary study has been conducted with needs and context analysis, with the results of the analysis as in Table 1.

| Table 1. Result of preliminary research |
|-----------------------------------------|
| Indicator                               | Percentage (%) | Category   |
| 1. SKL of analysis                      |                |            |
| Attitude dimension                      | 66.4 %         | Less       |
| Dimensions of knowledge                 | 81.2 %         | Good       |
| Dimensions skills                       | 67.5%          | Less       |
| 2. Analysis of Learning Activities      |                |            |
| Introduction                            | 83.3 %         | Good       |
| Core Activities                         | 71.2 %         | Less       |
| Closing activities                      | 90.0 %         | Good       |
| 3. Analysis of learners                 |                |            |
| Initial capability                      | 63.0 %         | Less       |
Based on Table 1, this needs analysis is conducted to see how important the textbooks to be developed and the developed textbooks can contribute well to improving the components present in the 2013 curriculum.

2. Methods
2.1. Validity
Textbooks have valid criteria when describing the curriculum of hope, is the components of the textbook indicate the validity of the content and the validity of the construct. In determining the validity of the content there are several questions that must be raised. Assessment of products based on questionnaires filled by experts analyzed to determine the extent of the validity of the products developed. Validity analysis using Likert scale with the steps as follows:
   a. Scores for each item the answer strongly agrees (4), agrees (3), disagrees (2), and strongly disagrees (1).
   b. Sums up the total score of each validator for all indicators.
   c. Granting validity by using Aiken's V formula:

   \[ V = \frac{\sum s}{n(c-1)} \]  

In this question, \( s = r - lo \) is the lowest validity score (in this case = 1), \( c \) is the highest validity score (in this case = 4) and \( r \) is the number given by the validator. The validity categories of the developed IPA textbooks can be seen in Table 2.

| Score criteria  | Category          |
|-----------------|-------------------|
| \( \geq 0.6 \)  | Valid             |
| \(< 0.6 \)      | Invalid           |

2.2. Practicality
Practicality is closely related to the ease and progress that learners gain in the use of science textbooks. Practicality test sheets are used there are two, namely: test pieces of practicality according to the teacher and practicality test sheet according to learners. Analysis of questionnaires of product practicality using Likert Scale. The steps of practicability analysis carried out are as follows:
   a. Scores for each item the answer strongly agrees (4), agrees (3), disagrees (2), and strongly disagrees (1).
   b. Sums up the total score of each practitioner for all indicators.
   c. Giving practicality value by using formula:

   \[ P = \frac{f}{N} \times 100\% \]  

Here \( P \) is final value, \( f \) is obtaining score and \( N \) is maximum score. The category of practicality can be seen in Table 3.

| Score criteria  | Category          |
|-----------------|-------------------|
| \(< 0.6 \)      | Invalid           |

Table 2. Category of Validity [5]

Table 3. Categories of Practicality [6]
3. Result and Discussion

3.1. Validity

Expert validation uses validation sheets for developed textbooks. The validation sheet is filled by three lecturers (experts) and two science teachers (education practitioners). Before doing textbook validation, it is necessary to assess the instruments that will be used to validate the textbook.

Assessment of the instrument is performed before testing the validity of textbooks developed. Assessment of instruments using validation sheet covering indicator that is linkage of indicator with objective, compliance statement / question with measured indicator, suitability between statement / question with purpose, and language used good and correct. The results of the textbook validation instrument assessment are presented in Table 4.

| Aspect are rated                                | Value of validator | Total | Value | Category |
|------------------------------------------------|--------------------|-------|-------|----------|
| The linkage of indicators with a purpose.      | 4                  | 4     | 3     | 8        | 0.89     | Valid |
| Conformity of the statement/question with the measured indicator. | 4                  | 4     | 3     | 8        | 0.89     | Valid |
| Conformity between statement/question with purpose. | 3                  | 4     | 3     | 7        | 0.78     | Valid |
| Language used is good and right.               | 4                  | 4     | 3     | 8        | 0.89     | Valid |

Based on Table 4, it can be stated that a valid instrument is used to measure the validation level of the IPA textbook integrated with the hurricane theme. This is evidenced by the value of each aspect assessed ≥ 0.6 which is in the valid category. The validity value of all validators for each component of textbook validation is presented in Table 5.

| No   | Aspects of Validation | Expert Validator | 1 | 2 | 3 | 1 | 2 | Value | Category |
|------|-----------------------|------------------|---|---|---|---|---|-------|----------|
| 1    | Content               | 0.79             | - | - | 0.89 | 0.96 | 0.78 | 0.86 | Valid    |
| 2    | Presentation          | -                | - | - | 0.94 | 0.91 | 0.79 | 0.88 | Valid    |
| 3    | Language              | -                | 0.98 | 1.00 | 0.98 | 0.89 | 0.96 | Valid    |
| 4    | Gradability           | -                | - | 1.00 | 0.96 | 0.84 | 0.94 | Valid    |

Based on Table 5, it can be concluded that the integrated IPA text theme of hurricane with the type of shared-based inquiry training to increase the response attitude of learners lies in the valid category. This is evidenced by the value of three experts and two practitioners for all components of textbook validation are in valid category. The developed textbooks have met the indicators developed in textbook validation.
3.2. Practicality
In the model of Plomp development for textbook practice, it starts from one-two-one, small group and field test. Before being used to measure the practicality of textbooks, instruments of practicality are validated by experts. Assessment of the test instrument of practicality (teacher response and student response) using validation sheet. The validator's assessment of the practicality instrument is presented in Table 6.

| Instrument validation | Value of Validator | Average | Category |
|------------------------|--------------------|---------|----------|
| Practice Tool          | 97.6               | 97.61   | very practical |
| Textbook Sheet         | 95.23              | 100     |           |

Based on Table 6 it is stated that, practical instruments can be used to measure the practical level of textbooks. This is evidenced by the average value of practical instrument that is 97.61 with very practical category, so it can be used to measure the practicality of textbook in science lesson. The results of the practicality test that has been implemented is shown in Table 7.

| No  | Statement       | Value |
|-----|-----------------|-------|
| 1   | Easy to Understand | 92.92 |
| 2   | Interesting     | 87.73 |
| 3   | Efficient       | 76.88 |

| Average | 85.84 |
| Category | Very Practical |

Based on Table 7, it is seen that the practicality level of textbooks with an average grade of 85.84 with category is very practical. Furthermore, based on the results of practical responses of learners to small group testing is done revision, that is on aspects there are misspellings of writing and there are sentences that have not been perfect. The shortcomings are equipped and improved hat clearer and more interesting, so that learners are motivated in learning science. After the revision, proceed to the large group test (field test). In the field test is divided into two parts, namely:

3.2.1. The Practicality of the Field Test Teacher Response.
The textbook practicality test of the teacher's response uses the teacher's response questionnaire. Questionnaire practicalities of textbooks include the following: (a) easy to understand, (b) interesting, and (c) efficient. Indicators for the practicality of teacher responses are 21 indicators. Practicality test results for textbooks of each statement are presented in Table 8.

| No  | Statement       | Value |
|-----|-----------------|-------|
| 1   | Easy to Understand | 93.75 |
| 2   | Interesting     | 94.32 |
| 3   | Efficient       | 81.25 |

| Average | 89.77 |
| Category | Very Practical |

Based on Table 8, it can be seen that the practicality level of textbooks in the category is very practical with a value of 89.77. The highest average score is in the attractive category of 94.32. While the lowest average value is in the efficient category that is 81.25.
3.2.2. **Practicality of Response of Student Field Test.** Test the practicality of the textbooks of the learners' responses using a questionnaire response of learners. The test results of the practicality of the response of learners on the field test (large group) of each statement is presented in Table 9.

| No | Statement        | Value  |
|----|------------------|--------|
| 1  | Easy to Understand | 85.14  |
| 2  | Interesting      | 84.92  |
| 3  | Efficient        | 82.71  |

**Table 9. Response of Student Field Test of Textbook**

Based on Table 9. it can be seen that the practicality level of textbooks in the category is very practical with a value of 84.26. The highest average score is in the Easy to understand category of 85.14. While the lowest average value is in the efficient category that is 82.71.

4. Conclusion
Integrated IPA textbooks of hurricane theme with inquiry-based shared types to increase the response attitude of learners are in valid category. This is evidenced by the value of three experts and two practitioners for all components of text book validation are in valid category. The developed textbooks have met the indicators developed in textbook validation. Furthermore, based on the results of practicality obtained that from the three steps done got the value with the category very practical, so it can be concluded that from research that has been done on IPA text book integrated hurricane-type shared storm-based shared theme is very valid and very practical for use by participants educate

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