Development of a valid student work sheet oriented on approach somatic, auditory, visual and intellectual (SAVI) assisted digital practicum tools

Nopem Trio*, Yulkifli, and Yohandri
Department of Physics, Faculty of Mathematics and Natural Sciences, Universitas Negeri Padang, Jl. Prof Hamka, Padang 25131, Indonesia

*nopem_trio@yahoo.com

Abstract. The purpose of this research is to develop the valid LKPD oriented on Somatic, Auditory, Visual and Intellectual (SAVI) assisted by digital practicum tool on temperature material, heat and kinetic theory of gas. This type of research is Research and Development using ADDIE model, where validity is at develop stage. The research instrument used is an observation sheet of LKPD validation questionnaire that developed, in addition to LKPD validation is also done on RPP and practicum tool. Data analysis used by descriptive analysis with validation data analysis technique using Aiken's V. LKPD oriented approach SAVI assisted digital practicum tool is valid if value ≥ 0.6 result of research indicate LKPD, RPP and practicum tool is in valid category (LKPD 0.84, RPP 0.98 and practicum 0.85). Conclusions from the results of the assessment by 3 experts, obtained LKPD oriented approach SAVI assisted digital practice tools with valid criteria.

1. Introduction
The quality of education can be seen from the success in the learning process in the classroom. The success of this learning process is determined by several factors, including the ability possessed by an educator in creating a conducive learning atmosphere. Conducive atmosphere will lead to the achievement of learning objectives in accordance with the curriculum and learners can understand the learning concepts provided by educator. According to [1] "Education is a conscious and planned effort to create an atmosphere of learning and learning process so that learners actively develop their potential to have spiritual power, self-control, personality, intelligence, noble character, as well as the skills needed, including in the field of education ".

The government has implemented several policies to realize the objectives of the National Education, one of which is to revise the curriculum in 2006 sed a curriculum of 2013. Expectations of these policies is that educators in the field of designing, implementing and assessing the learning process in accordance with the reference speckle uluum 2013 ie standard process [2] Permendikbud No. 22 of 2016 which requires educators in designing lesson plans do media preparation in accordance with the characteristics of learners and apply the model and integrate ICT systematically in accordance with the conditions of learners.

The demands of 21st century competence that requires educators to master the learning that is integrated with digital technology [3,4] or computer [5,6] and for learners should be introduced and familiarized in learning one of them is in physics learning. Physics as one of the high school level
subjects in achieving the Competency Standards Graduates provide contributing to the development of attitudes, knowledge and skills and demanding activity, creativity and the ability to find solutions from a problem demanded by the 2013 curriculum through practicum activities. In fact, based on the results of analysis at SMAN 1 Padang there is a gap between expectations with which in the schools, this is reinforced by the data in the Table 1.

| Competence  | Average Value |
|-------------|---------------|
| Attitude    | 87.03         |
| Knowledge   | 72.26         |
| Skills      | 74.38         |

Based on Table 1 it can be seen that the competence of learner’s knowledge is still low. Also seen from the results of observations and interviews conducted in SMAN 1 Padang, currently still in school use a learning process that is more focused on learning that asks learners to understand the subject matter by way of lecturing methods, reading books or learning resources provided in school, so the experience direct learners to learning materials are reduced and the ability of students on the competence of attitudes and skills less than the maximum

Based on the observation on the planning of learning in SMAN 1 Padang it appears that the teacher has prepared the learning tools based on the curriculum 2013, Master also convey the purpose of learning before learning. In learning on temperature, heat and gas kinetic theories in addition to using lecture methods, teachers also use the method of discussion. But the experimental method has not been fully used in learning. This causes learners have not been trained in acquiring knowledge with concrete experience, observing reflections, composing abstract concepts, and applying the knowledge gained. Teachers have implemented the 2013 curriculum learning model. However, in practice the learning model in the class has not activated the students in its entirety.

The other learning devices observed were the sources of physics learning used. In learning the teacher uses several books from the publisher's package. Learners also have teaching materials in the form of student worksheets (LKPD) which is also obtained from the publisher. LKPD is not necessarily in accordance with the characteristics of learners. In LKPD used by students, presented material temperature, heat and gas kinetic theory and worksheet. LKPD owned learners have not led learners in investigating knowledge and discovering the concept of learning. This leads to the activity of learners to try and find a less than maximum learning concept. The LKPD used does not fully enable learners to do or use practicum. LKPD that is widely used in schools uses more non-experiment worksheets. This means that the LKPD used has not been used Somatic, Auditory, Visual and Intellectual (SAVI) approaches. Observations were also conducted on the learner by giving a questionnaire. Based on the result of questionnaire data, it can be concluded that LKPD used in school is not suitable with the characteristics of learners.

One way to overcome this problem is to develop LKPD-oriented physics approach SAVI. This approach is used because in the Somatic (body movement) activities students are required to use their body parts to conduct further practicum activities on Auditory activities (communicates) learners are required to conduct discussion activities that listen and express opinions in discussion activities, visual activities (observing and asking) learners are required to observe images and videos displayed which raises questions and problems found by learners and lastly on Intellectual activities students are given training in the form of questions contained in LKPD.

SAVI approach is meaningful when learners play an active role in conducting learning activities by combining the four components that affect the classroom learning. These four ways of learning must exist for optimal learning. The development of worksheets to be used is a physics-oriented work sheet of the SAVI approach on the temperature, caloric, and gas kinetic theories examine the validity, practicality, and effectiveness of the use of the designed Learner sheet. Based on the background that
the researchers have outlined has developed a physics-oriented Physical Activity Sheet of the SAVI approach to the temperature, calorie and kinetic-assisted gas theories of digital practice tools.

2. Methods
The type of research that will be conducted is research and development or Research and Development (R & D). Development is a process used to develop and validate educational products [8]. Research and Development is defined as a deliberate, systematic, purposive / directed research method for finding, formulating, improving, developing, producing, testing the effectiveness of products, models, methods / services of certain procedures that are superior, new, effective, efficient, productive and meaningful [9]. Furthermore, research and development methods are research methods used to produce specific products and test the effectiveness of these products”. So, R & D will produce a valid, practical, and effective product [10]. R & D research begins with research activities to obtain information about the needs of users and in the implementation of product trials followed by development activities to produce products namely LKPD. In this development research, the product that will be developed is LKPD based on SAVI approach with the tools of digital practicum in physics learning material temperature, heat and kinetic theory of gas class XI SMA with valid criteria.

The development model used in this research is the development model ADDIE. This model stands for Analysis, Design, Development, Implementation and Evaluations [11]. This model consists of five phases or main stages according to its name, which is analyzing, designing, developing, implementing and evaluating. These five phases need to be done systematically.

The technique of collecting data for validity test is a validity sheet for experts / experts to determine the validity of the product. The type of data in this study is primary data, i.e. data taken directly from the results of observation of questionnaires to learners.

Assessment of products based on questionnaires that have been filled by experts analyzed to determine the extent of the validity of the products developed. Validity analysis using Likert Scale with steps:
a. Gives score for each item very good answer (4), good (3), enough (2), and less (1).
b. Sums up the total score of each validator for all indicators.
c. Granting validity by using Aiken’s V formula:

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

where:
- \( s = r \cdot lo \)
- \( lo = \) The lowest validity score (in this case = 1)
- \( c = \) The highest validity score (in this case = 4)
- \( r = \) The number given by the validator

Validity category can be seen in Table 2.

| No  | Value | Criteria |
|-----|-------|----------|
| 1   | ≥ 0.6 | Valid    |
| 2   | <0.6  | Invalid  |

3. Result and Discussion
Validation performed includes: content validation, construct validation and discussion validation. Validation of content declared valid by the validator because the developed learning device has in line with material that should be presented. While validation of the construct is a valid test based on construction expert’s opinion [12]. So, in this study, the assessor a n validation focused on the validation of the content, and language constructs that instrument arranged in a list of designated assessment by the validator. An instrument is said to be valid if the instrument can be used to measure what should be measured [13].
LKPD, RPP and practicum tools that has been designed to be tested for its validity. Validation was done on 3 instruments namely LKPD, practicum and RPP by 3 lecturers from UNP and 2 physics teachers. The LKPD validation is done by the validators of YD, RA and ZK as well as 2 physics teachers namely ZS and SR. Validation results are described as follows:

3.1. Instrument validation
Before validating the product, validation of the instrument used to validate the product is developed. The result of instrumental validation can be seen in Table 3.

| Instrument | V Value | Category |
|------------|---------|----------|
| LKPD       | 0.84    | Valid    |
| Practicum  | 0.85    | Valid    |
| RPP        | 0.98    | Valid    |

Based on Table 3 it can be stated that the instrument has been developed in a valid category, where the value of V is large from 0.6. Thus, this instrument can be used.

3.2. LKPD Validation
LKPD validity test is performed after validation validity validation test. The instrument assessment uses a validation sheet that includes the following indicators: clarity of the validation of the validation sheet, the statements made in accordance with the indicator, the objectives to be achieved, do not contain multiple meanings, using simple and easily understood scoring formats, and the corresponding language with good and true EBI rules. Validate learners worksheet-oriented SAVI approach consists of four aspects: the content, language, constructs and graphics. The LKPD validation result oriented towards SAVI approach can be seen in Table 4.

| No | Validation Components | Validator 1 | Validator 2 | Validator 3 | Value |
|----|-----------------------|-------------|-------------|-------------|-------|
| 1  | Contents              | 22          | 22          | 21          | 0.87  |
| 2  | Construct             | 22          | 23          | 20          | 0.87  |
| 3  | Channel               | 19          | 20          | 19          | 0.78  |
| 4  | Language              | 20          | 21          | 21          | 0.82  |
|    | Average               |             |             |             | 0.84  |

Based on Table 4 it is stated that the developed LKPD is a valid category, where in the content aspect, graphic constructs and language obtained a large V value of 0.6. The result of LKPD validation on the content feasibility aspect is in valid category with an average of 0.87, the construct aspect is in the valid category with the mean of 0.87 and the graphic aspect is in the valid category with an average of 0.78 and linguistic aspect 0.82 is also in the category of valid with the average Overall LKPD is valid as it obtained value ≥ 0.6. This is reinforced by the opinion [11] a product is said to be valid if each indicator is at a value of ≥ 0.6 and not valid <0.6. Thus, LKPD can be used in the learning process.

3.3. Tool Validation
On validation Boyle Balloon Practice tool, validation is done on four aspects namely objective, technique of operation, accuracy of use and working principle. The summary of validation values of all validators for each validation component of Boyle Balloon practice tools with digital displays is presented in Table 5.

Based on validation result, it can be concluded that Boyle Balloon practicum with digital display is in valid category. This is evidenced by the value of each aspect is in the value of ≥ 0.6. Thus it can be
concluded that LKPD is oriented towards SAVI approach on temperature, calorific and kinetic gas and digital display practicum can be used and done real test in the learning in school.

Table 5. Results Validasi Practical Tools Boyle Balloon With Digital Display.

| No.  | Validation Components | The value of the Validator | Value |
|------|------------------------|----------------------------|-------|
| 1    | Aim                    | 15                         | 15    | 14    | 0.89 |
| 2    | Operating Technique    | 10                         | 11    | 9     | 0.78 |
| 3    | Accuracy of Use        | 11                         | 10    | 11    | 0.85 |
| 4    | Work principle         | 7                          | 8     | 7     | 0.89 |
|      |                        |                            |       |       | 0.85 |
| Average |                        |                            |       |       | 0.85 |

3.4. RPP validation

The result of RPP validation by incorporating the SAVI approach can be seen in Table 6. Based on Table 6, it can be stated that the RPP is designed in all three aspects i.e. content, constructs and languages are in valid category. Therefore, this RPP can be used in the learning process.

Table 6. RPP Validation Results

| No.  | Validation Components | The value of the Validator | Value |
|------|------------------------|----------------------------|-------|
| 1    | Feasibility of Content | 81                         | 78    | 73    | 0.98 |
| 2    | Construction           | 67                         | 65    | 68    | 1.00 |
| 3    | Language               | 10                         | 9     | 10    | 0.96 |
|      |                        |                            |       |       | 0.98 |
| Average |                        |                            |       |       | 0.98 |

Based on the validation result that has been done, it is found that the developed product included in the category is valid. However, there are some suggestions given by validators. The validators provide suggestions, advantages and disadvantages that are useful for formative evaluation and revision of LKPD.

4. Conclusion

LKPD validation results invalid in the category, with an average of 0.84 Retained Earnings LKPD declared invalid because the gain value ≥ 0.6. This product is said to be valid since the validity value of ≥ 0.6. Validation Boyle balloon practice tool is in a valid category with an average of 0.85 it can be concluded that this tool is feasible to be used in practicum activities and so is RPP validation is in valid category with an average of 0.98 which means that this RPP is feasible for use in process learning.

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