# THE DEVELOPMENT INSTRUMENTS OF PHYSICAL EDUCATION JUNIOR HIGH SCHOOL BASED ON CHARACTER LEARNING

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## Abstract

This research aims to generate learning and assessment character instruments which appropriate to use in teaching junior high school Physics. This type of research is R and D, covering the development of a preliminary study, design, development, validation, and test the practicalities with revisions as necessary, learning devices that researcher develop such as syllabi, lesson plans, worksheets, tests of learning outcomes and instrument rating characters. Research has demonstrated the validity of learning characterized by high category, while the validity of the assessment instrument is also a high category, empirical test results obtained Cronbach alpha values for character assessment instruments 0.966, larger than the table r 0.433, meaning that the instrument is reliable. Thus it can be interpreted that the learning and assessment instruments character valid and appropiate to use in junior high school physics lessons.

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**Keywords**: instrument of character learning, instruments of character assessment

## Introduction

In the last decade, science education research has shown a shift towards constructivist paradigm. Constructivist learning requires teachers to provide activities that can stimulate students' curiosity and help them express their ideas and communicate their scientific ideas. In the formation of students' knowledge and understanding in the mediator and facilitator by a teacher (Suparno, 1997, Sham, 2008).

Character education is one of the constructivist learning model in the form of character education, which involves aspects of the theory of knowledge, feelings, and actions. Thomas Lickona said, without this then the third aspect of character education will not be effective and the implementation was to be done in a systematic and sustainable. In character education a child will be emotionally intelligent. Emotional intelligence is important in preparing children will be facing the future, with a person's emotional intelligence will succeed in the face of challenges, including the challenge to succeed academically.

In a study of Marvin Berkowitz, University of Missouri-St Louis (Masnur, 2010) showed an increase motivation in students academic achievement in schools implementing character education. The classes are comprehensively involved in character education showed a drastic reduction in negative behaviors that can impede student academic success

Learning outcomes or learning experience of a learning process can impact directly and indirectly. The direct impact of teaching called instructional impact (instrucional effects) while the indirect impact of the involvement of students in a typical classroom activities designed by teachers called effects accompanist (nurturant effects). To optimize student learning outcomes, required instruction in accordance with the learning objectives that can be achieved. Khairuddin et al, 2009, argued before the teacher teaches (preparation phase) are expected to prepare teachers who want to teach the material, preparing teaching aids / lab to be used, prepare questions and referrals to lure students active learning, students study the situation, understand the weaknesses and excess students, as well as prior knowledge students learn, all of which will biodegrade in a learning device implementation.

Khairuddin et al, 2009 stated that "The study is a number of materials, tools, media, hints and guidelines that will be used in the learning process." From the description it can be argued that learning is a set of media devices or means used by teachers and students in the learning process in class, a series of learning tools that a teacher must be prepared to face classroom learning. Learning device in accordance with the character education including character Syllabus, lesson plans and worksheets character.

Based on the learning process in schools in Pekanbaru, that learning process happened is still focused on the teacher as the main source of knowledge. Development of character education using learning tools character has not developed by teachers. The teachers are still using the regular learning. This is due to be difficult because the teachers do not understand that in making the character of learning expected by the government.

Based on the above, the authors are interested in doing research with the title "Junior Physics Learning Software Development by Using Interactive Conceptual Approach to Teaching Character

Based on the above background, it is a formulation of the problem in this research is:
1. How is the validity of the developed character of learning in teaching junior high school physics?
2. How is the validity of assessment instruments in physics learning SMP characters are fit for use in junior high school students?

This study aims to Junior Physics Learning Software Development by Using Interactive Conceptual Instruction (ICI) in Character Learning Model

## Literature Review

**Interactive Conceptual Instruction *(ICI)***

Interactive Conceptual Instruction, (ICI) or interactive conceptual learning is a cornerstone of learning thinking skills (Utomo, 2010). Interactive conceptual learning approach is one alternative learning constructivist-based conceptual change. Interactive conceptual learning developed by Savinainen and Scott strongly supports the development of thinking skills of students starting from the level of understanding of concepts that require an interactive process that provides an opportunity to develop ideas through a process of dialogue and thought.

Interactive conceptual learning approach consists of four stages which can not be separated, namely 1). Conceptual focus, 2). Classroom interaction, 3). Use of texts, and 4). Classrom based assessement. In the implementation, these four components form a complete learning (Utomo, 2010).

a. Conceptual Focus
Conceptual Focus the development of new ideas that focus on conceptual understanding with little or no mathematical formulation. At this stage of learning begins with demonstrating the phenomena related to the subject to be studied.

b. Classroom Interaction
Classroom Interaction is the second stage of ICI models. At this stage of the interactions involved in the class. Students formed into groups that are heterogeneous. This stage is based on the premise that the creation of meaning is an inter-community dialogue class to develop ideas through the process of thinking. In classroom interactions, learning occurs involving peers.

c. Use of texts
The use of a textbook is intended to enhance the students' understanding in more depth. Students are not allowed to bring the records containing the definition of the concept directly. The essence of the use of the textbook is that the understanding gained from interaction with students and the book comes from an understanding of a text, not from the process of copying the definition of a book. Students are required to create / add records in a sentence, underlining important sentences, then draw a conclusion from the definition of a concept they learned

d. Classroom based assessement
To determine whether students have mastered the material that has been learned or not an evaluation or assessment. Assessment is an information gathering activities learning outcomes to determine whether a student has mastered the competencies that have been set. Based on the data and information obtained, a teacher can give a decision on student achievement. In this case, the assessment is more focused on classroom-based assessment (classroom based assessement). Assessment here is divided into two parts: process assessment (quiz) and daily test assessment.

**Definition of Character Education**
Character literally means "mental or moral qualities, moral strength, name or reputation" (Masnur. 2011). The Dictionary of Psychology stated that the character is a personality in terms of ethical or moral standpoint, for example, honesty is usually someone who is concerned with the properties of a relatively fixed. It can be concluded that the character represents the values of human behavior related to Almighty God, ourselves, our fellow humans, the environment, and nationhood embodied in thoughts, attitudes, feelings, words, and actions based on religious norms, legal , manners, culture, and customs.
In character education in schools, all of the components (stakeholders) should be involved, including educational components themselves, ie the contents of the curriculum, learning and assessment, quality of relationships, handling or management subjects, school management, the implementation of the activities or co-curricular activities, empowerment infrastructure, financing, and working ethos throughout the school community and the environment.

In spite of various shortcomings in the practice of education in Indonesia, when seen from the national education standards, the reference curriculum development (SBC), and implementation and assessment of learning in schools, educational purposes in schools can actually be achieved with either. Character building is also included in the material that must be taught and mastered and realized by learners in everyday life. The problem, character education in schools has been the introduction of a new touch to the level of norms or values, and yet at the level of internalization and action in everyday life.

Character education aims to improve the quality of the implementation and outcomes of schooling that leads to the achievement of the formation of character and moral values of students as a whole, integrated and balanced, appropriate competency standards. Through character education learners are expected to be able to independently improve and use the knowledge, study and internalize and personalize the character values and morals so manifest in everyday behavior. Through this program, each graduate is expected to have the faith and devotion to God Almighty, noble, noble character, academic competence and integrated whole, as well as having good personality fit the norms and culture of Indonesia. At a broader level, character education is expected to be the school culture.

**Impact of Character Education on Academic Achievement**
In a study of Marvin Berkowitz of the University of Missouri-St Louis, showed increased motivation in students academic achievement in schools implementing character education. The classes are comprehensively involved in character education showed a drastic decrease in negative behaviors that can impede student academic success.

Character education is moral education, which involves aspects of the theory of knowledge, feelings, and actions. By Thomas Lickona, without these three aspects of character education may not be effective and the implementation was to be done in a systematic and sustainable. In character education a child will be emotionally intelligent. Emotional intelligence is important in preparing children will be facing the future, with a person's emotional intelligence will succeed in the face of challenges, including the challenge to succeed academically.

**Implementation of Character Education in the Learning Process**Regulation of the Minister of Education No. 41 of 2007 states that the core activities of learning is divided into three stages, namely exploration, elaboration, and confirmation. In the exploration phase facilitated learners to acquire knowledge and develop attitudes and skills through student-centered learning. In the elaboration phase, learners are given the opportunity to acquire knowledge and skills, and attitudes further through sources and other learning activities, knowledge, skills, and attitudes of learners and the wider. At the confirmation stage, learners obtain feedback on the correctness, feasibility, or the acceptance of the knowledge, skills, and attitudes acquired by students.

Here are some characteristics of the learning process at this stage of exploration, elaboration, and confirmation that potentially can help students internalize the values taken from Standard Process.

**a. Exploration**
**b. Elaboration**

c. **Confirmation**

**Instrument of Physical Education Based On Character Learning**

Educational success is the most important thing for a teacher, to meet these objectives requires a thorough preparation. Khairuddin, et al (2009) argued before the teacher teaches (preparation phase) are expected to prepare teachers who want to teach the material, preparing teaching aids / parktikum to be used, prepare questions and referrals to lure students active learning, students study the situation, understand the weakness and excess students, as well as beginning students learn the knowledge, all of which will biodegrade in a learning device implementation.

Khairuddin, et al. (2009) suggested that "learning devices are a number of materials, tools, media, hints and guidelines that will be used in the learning process." From the description it can be argued that learning is a set of media devices or means used by teachers and students in the learning process in class, a set of learning tools that a teacher must be prepared to face classroom learning including the syllabus, implementation of the learning Plan (LP), Student Activity Sheet (SAS).

**Character Assessment Instrument Development**

Characters are part of the affective domain. According to Andersen there are two methods that can be used to measure the affective domain, ie a self-report methods (self-assessment) and the method of observation.

Self assessment is the involvement of students in identifying criteria orstandards to be applied in making decisions about learning and achieving the criteria and standards, in other words, self-assessment is a process in which students have the responsibility to assess their own learning outcomes

Implementation of self-assessment must meet the following :

a. Rationalization clear so students know what to do
b. The existence of clear procedures so that students know what to do
c. Necessary assurance to students that they can do the job honestly without fear
d. Notice to students that they should believe in themselves so that they do not cheat on each other in a given task, and if there are students who cheat the teacher will know about it.

# Methodology

This research was conducted at the Laboratory of Physical Education majoring in Mathematics and Science Faculty of Teacher Education Riau University, Academic Year 2011/2012. The study was conducted from July to December of 2012. According to Borg and Gall that the modified Sukmadinata (2010), models of research and development is "a process used develop and validate educational product".

This research sometimes also called a 'research-based development', which emerged as a strategy and aims to improve the quality of education. In addition to developing and validating the results of education, research and development also aims to discover new knowledge through 'basic research', or to answer specific questions about the problems of a

practical nature through 'applied research', which is used to improve educational practices. In this research, Research and Development exploited to generate a decent character learning tools used in teaching junior high school physics.

Step of research and development in this study outline stands on three stages, namely: a) the preliminary study, b) development of learning instruments; c) instrument validation study; d) test learning device. Description of step - step study, in figure 1:

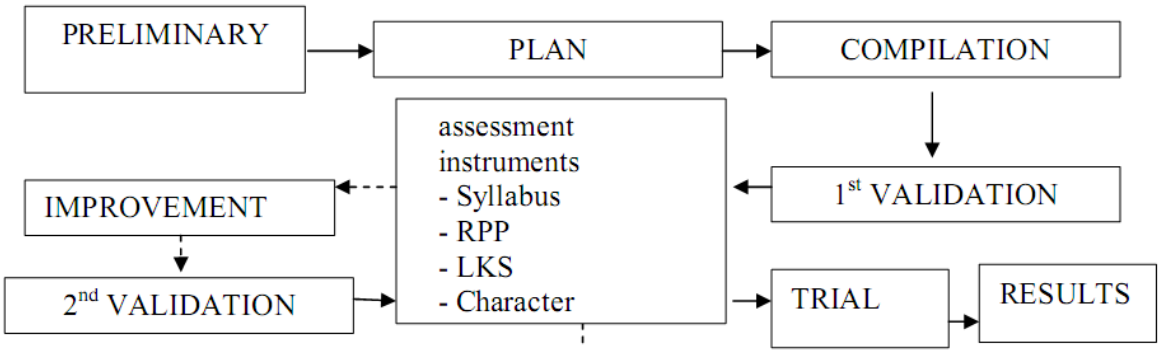


Figure 1. Research Implementation Phase

**Assessment of instruments**

Data collection instruments used in this research are:

1. Assessment sheet contents (Classroom Action Research, 2012) and the format of the syllabus (UNS, 2010)
2. Assessment sheet contents (UNS Adaptation, 2010) and RPP format (UNS 2010)
3. The content and format of the assessment sheet LKS (UNS, 2010)
4. Formative assessment sheet test
5. Assessment form the character assessment

Data Analysis Techniques

Technical analysis of the data in this assessment is a descriptive analysis, namely:

1. Compute their validity index of each component device developed learning validity index component states where the percentage of components that declared valid by the validator.
2. Compute the index validity learning device wherein the device pembelakaran validity index (syllabus / lesson plans / worksheets / formative tests) is the number of valid components in comparison with the total number of components are assessed Multiplied by 100%.

$$\text{The validity index} = \frac{\text{Number of valid device components}}{\text{The total number of components are}} \text{ x100\%}$$

**Conclusion Criteria**

Criteria for drawing conclusions of this research are as follows:

**1.** Each component of the learning assessment device format (syllabus / RPP / LKS) have high validitasi index if more than 80% of the component validator stated "no".
**2.** Each - each component of the assessment of learning content (syllabus / lesson plans / worksheets / formative tests) have high validitasi index of more than 80% if the validator declared fit / very fit.
**3.** The syllabus is valid when its validity index of 100%, which means that all valid components
**4.** RPP is valid when its validity index of 100%, which means that all components are valid
**5.** LKS is valid when its validity index of 100%, which means that all valid component
**6.** Learning device is valid if all of the components of the index have high validity assessment.

# Results

The following will explain the study results in each step of the R & D :

1. Preliminary

The author has made observations and interviews with teachers of physics. the author was informed that the way students learn physics today is still focused on teachers, teachers still rely on the lecture method of teaching so that students receive instruction in passive, learning has done more focused on solving math so often forgotten concepts contained in such material. Learning tools that teachers use more often take away from other teachers such as on the internet and has yet to include the values of character, these devices directly used without validated so that the device is likely not appropriate and no beak again with the development of education.

2. Planning of instruments

Planning of instrument developed learning the syllabus, lesson plans, worksheets, such devices by taking optical material and by entering the values of the characters who want to be trained in the students so as to continue to be trained and eventually became accustomed to the culture.

3. Drafting of instrument

The draft that the author has been led to develop learning-oriented learning model character. The author in this case using resources such as curriculum, junior high school physics textbook on optical materials, guide the preparation of conceptual approaches based interactive learning model to ignore the character by not leaving the unit level educational curriculum has been set by the National Education Standards

4. Validation and Improvement of instruments

According to the stages of preparation of the devices listed in Chapter III, the author developed a learning device has been validated twice by 4 lecturers and two teachers). Validation of the syllabus, lesson plans, and worksheets done twice, because in-1 device validation is not valid. Components of the learning that has not been valid in-1 improved validation to assess the validation-2 in order to obtain a learning device is valid and fit for use as a learning device in school.

Validation results obtained from the 6 validator, both validation and validation-1-2 and its improvement can be explained as follows:

a. Validation Instrument Syllabus

1. Format Validation Instrument 1

Validation format the device used to view devices based on a standard format that is standard device format, the validator only see the availability of all the indicators that exist in the format of learning. Based on data analysis, validation of results obtained 1 device format as in Table 1.

Table 1. 1st Validation of Instrument Format

| No | Instrument | Number of Assessment Component | % Validation | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | $V_1$ | $V_2$ | $V_3$ | $V_4$ | $V_5$ | $V_6$ |
| 1 | Syllabus | 15 | 100 | 100 | 100 | 100 | 100 | 100 |
| 2 | Lesson Plan | 22 | 100 | 100 | 100 | 100 | 100 | 100 |
| 3 | Worksheets | 7 | 100 | 100 | 100 | 100 | 100 | 100 |

Table 1 shows that the device format (syllabus, lesson plans and worksheets) has met the standards established format, is evident from the 6 validator in validation 1 has been completed questionnaires were given and the 6 validator has been interpreted that the format has met the criteria for creation learning devices format. Based on this first validation means that the format meets the standards that have been defined so that 2nd validation is not necessary .

2. Content of Instrument Validation

Validation contents this device are used to view the contents devices, every indicator the contents of device said to be valid if the validator had been give value 3 or 4, but it if the validator provide value 1 or 2 then the on a these indicators must repaired and after repaired continue on the validation into 2. Based on data analysis, validation of the results obtained 1 Content device as shown in Table 2.

Tabel 2. First validation of content

| No | Instrument | Number of Indicator Assessment | % Validation | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $V_1$ | | $V_2$ | | $V_3$ | | $V_4$ | | $V_5$ | | $V_6$ | |
| | | | Valid | % | Valid | % | Valid | % | Vali | % | Valid | % | Valid | % |
| 1 | Syllabus | 16 | 9 | 56,3 | 16 | 100 | 16 | 100 | 14 | 87,5 | 16 | 100 | 16 | 100 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Lesson Plan | 38 | 29 | 76,3 | 38 | 100 | 38 | 100 | 28 | 73,7 | 38 | 100 | 38 | 100 |
| 3 | Worksheets | 15 | 12 | 80 | 15 | 100 | 15 | 100 | 13 | 86,7 | 15 | 100 | 15 | 100 |
| 4 | Assessment | 12 | 8 | 75 | 12 | 100 | 12 | 100 | 11 | 91,2 | 12 | 100 | 12 | 100 |

According to Table 2 shows that from 6 validator that validates the contents of the device (syllabi, lesson plans and worksheets) 4 validator gives a value of 3 or 4 of each indicator that there is on the content of the device, while the second validator (validator 1 and 4) provide an assessment that there are still some indicators are not valid and require repairs and improvements must be made to the validation-2. After repairs and improvements made to the validation-2 was obtained from all validators with high category and interpret the contents of the device has a valid.

3. Character Assessment Instrument Validation

Validation is done 2 times a validation instrument, a statement on the instrument as valid if having an average score of at least 3, and if all validators provide an assessment with a score of at least 3, following illustrated the distribution point declaration is divided into two characters, which is the principal character and the main character:

a. Main Character

Tabel 3. Distribution of grain statement on validation 1 and 2

| No | Main Character Variable | Number of Statements | | | Valid Statements |
|---|---|---|---|---|---|
| | | 1st Validation | 2nd Validation | Trial | |
| 1 | Religion | 13 | 4 | 3 | 3 |
| 2 | Honesty | 13 | 5 | 3 | 3 |
| 3 | Intelegency | 7 | 4 | 3 | 3 |
| 4 | Strenghness | 9 | 3 | 2 | 2 |
| 5 | Democratize | 10 | 4 | 1 | 1 |
| 6 | Careness | 13 | 4 | 2 | 2 |
| Total | | 65 | 24 | 14 | 14 |

b. Special Character

Tabel 4. Distribution of grain statement on validation 1 and 2

| No | Special Character Variable | Number of Statements | | | Valid Statements |
|---|---|---|---|---|---|
| | | 1st Validation | 2nd Validation | Trial | |
| 1 | curiosity | 9 | 3 | 3 | 3 |
| 2 | Logical Think | 3 | 2 | 2 | 2 |
| 3 | Creative, Inovative and critism Mindset | 6 | 3 | 1 | 1 |
| 4 | Healthy Life | 6 | 3 | 2 | 2 |
| 5 | Confident | 7 | 3 | 1 | 1 |
| 6 | Valuing Diversity | 4 | 0 | 0 | 0 |
| 7 | Discipline | 4 | 3 | 3 | 3 |
| 8 | self-reliance | 4 | 3 | 2 | 2 |
| 9 | Responsibility | 7 | 0 | 0 | 0 |
| 10 | Interested in knowledge | 7 | 3 | 1 | 1 |
| 11 | Accuracy | 6 | 3 | 3 | 3 |
| 12 | Polite | 4 | 2 | 2 | 2 |

| | | | | | |
|---|---|---|---|---|---|
| 13 | Cooperation | 14 | 5 | 2 | 2 |
| 14 | Hard Work | 13 | 3 | 3 | 3 |
| | | 94 | 36 | 25 | 25 |

After a second validation test and found that the assessment instruments cuba characters with the high category of the test result reliability using SPPS 14 r table value is 0.433 while the coefficient alpha value 0.966, thus the value of alpha count is greater than r table, meaning that valid and reliable instrument .

## Discussion

**1. Learning Instrument**

a. Learning Instrument Format (syllabus, lesson plans and worksheets)

The results validate the format of Learning Instrument (syllabi, lesson plans and worksheets) in Table 1 shows that the index format validity of 100%, which means that the format is well-developed syllabus. From 6 people validator everything is assessing that learning devices format, good syllabus, lesson plans and worksheets already meet the requirements and are in accordance with the standard provisions in device fabrication. Assessment has been done and that has been given to the validator found that of the 15 indicators in the assessment of the syllabus format, 22 assessment indicators in RPP and 7 format to format worksheets assessment indicators are readily available, meaning that all items that should exist in the format of a standard learning devices already met all of them.

b. Content Of learning instrument (syllabus, lesson plans and worksheets)

1. syllabus

Validate the contents of the syllabus conducted twice, first by 4 validation of the validator has given judgment that the content of the syllabus is valid despite the high category, but there are still two validators are not made a judgment that the content of the syllabus is valid, because the results on the validity of the first not satisfactory especially on aspects or components of devices that get value 1 or 2 of the validator. Suggestions for improvement provided by the validator has been followed by researchers and after improvements to the aspects that are not appropriate to validate the validity of the second one done, from the judgment obtained validator that aspect still less appropriate (grade 1 and 2) has been given validator value by 3 or 4, which means that these components are valid. This indicates that the addition in some parts syllabus has been developed in accordance with the criteria of sound character education syllabus. Validity index has changed from 3.08 to 3.16 with the high category.

Assessment indicators syllabus content that has not been satisfactory and improvement suggestions given by the validator in validation 1.

a. The principle of development is inadequate
b. Less actual development principles and contextual
c. Learning activities outlined have not reached mastery Basic Competency
d. Indicator assessment is not in accordance with the demands of Basic Competency
e. Addition of source type / material used refers to any standard of competence and basic competences set
f. Adding character expected corresponding KD and SK and indicators

b. Lessons Plans

Validation is performed 2 times, at Lesson plans results validate the contents of the first validitasi not satisfactory, the validator of 6, 4 of which has assessed that the content of the Lesson Plans is good and in accordance with applicable rules, so that 4 people validator is saying that the content of this lesson plan is valid, while validator 1 and 4 are still not made a judgment that the content of this lesson plan is valid, it is evident there are some indicators that a score below 3 of the validator. Here's Lesson Plans assessment indicators that have not been satisfactory and improvement suggestions given by the validator on the first validation:

a. Lesson Plans less developed culture of reading and writing
b. There is no feedback and follow-up on the Lesson Plans
c. The addition of the application of information and communication technology
d. Improvement of learning objectives
e. Addition of teaching materials
f. The suitability of the approach / strategy / model / learning methods
g. Adding some learning objectives that include cognitive aspects
h. Adding forms of motivation
i. Adding instructional materials
j. Facilitate learners to report exploration conducted both orally and in writing, individually or in writing

Once the revision is given to the validation of the validator to do-2 obtained that the change of the value of a score of 1 and 2 into 3 or 4 so that the validity of the index changed from 3.03 to 3.10 with the high category. Lesson plans insightful character education has criteria that have to add / modify learning activities, learning objectives, learning and assessment indicators to develop character (Aqib, Zainal.2011), content validity Lesson Plans Lesson Plans show that the developed learning activities can lead to to achieving basic competency in accordance with the criteria of character education insightful Lesson Plans

c. Worksheet

Same with the syllabus and lesson plans, worksheets contents Validation done twice because of the 6 validator 2 of which still exist who score below 3, so there are certain indicators that require repairs that needed validation to two, a few notes from the first validation the indicator still have a score below 3 are:

a. Varying the balance between writing, menggambarn using tools and speaking.
b. Worksheet about giving children the opportunity to search for different information sources.
c. Provide activities for the development of social and emotional relationships.

This deficiency repairs and validated to 2, assessment scores increased from 2 to 3, worksheet validity index changed from 3.05 to 3.10 with the high category. Worksheet content validity index indicates that the worksheet was developed already qualified didactic, construction, and technical worksheet should be able to increase student engagement and encourage more activity on improving the character of the student.

d. Cognitive Learning Outcomes Assessment

Cognitive assessment validation performed two times as there are indicators that a score below 3, which

1. Choice of answers in the form of numbers not consecutive
2. The use of images is not clear
3. There are inter-related to each other about

After the repair and return validated, the score indicator worth 2 changed to 3, so the validity index changed from 3.01 to 3.12 with the high category. From the validation results show that the cognitive learning outcomes assessment has been developed in accordance with the indicators of learning about the indicators.

**e. Character Assessment Instruments**

Validated instruments are also twice as unsatisfactory results of the first validation that there is some point declaration that scores below 3 of the validator. Here are some suggestions for improvement provided by the validator on the first validation:

a. Items similar statements many meanings
b. Reducing the number of grains statement
c. Repairs way of writing
d. Repairing the language of the sentence used

Having assessed by a validator to validate 1 then made improvements, the authors reduce the number of grains of 163 statements statements statements to 60, 103 items discarded statement

Having assessed by a validator to validate 1 then made improvements, the authors reduce the number of grains of statements from 163 to 60 statements in which 103 statement discarded, 3 transferred statements and 57 statements repaired, while the test is obtained only 39 statements are expressed valid. Empirical test results obtained Cronbach alpha values for character assessment instruments is greater than 0.966 r 0.433 table, meaning that these instruments are reliable

For more details, reducing the number of statements contained in the validation I to II and validation trials can be seen as in the picture:

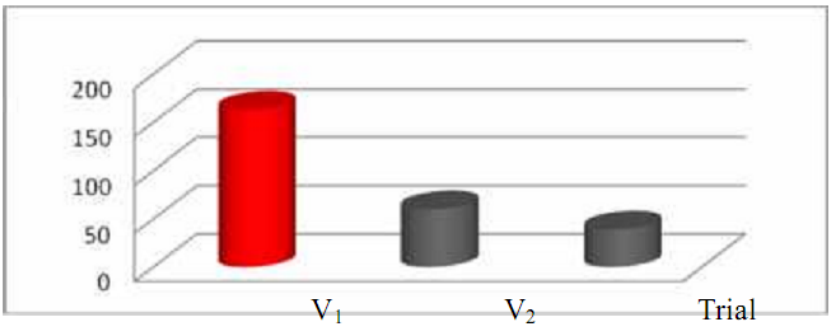


Figure 2. Graph reduction in the number of grains

Item statements can be grouped in three categories, namely:

1. Desertion is a point declaration received an average score of ≤ 3 on-1 as well as validation of indicators did not reflect the character or statements that have the same meaning with the other characters point declaration.
2. Moved is the item that statement has more meaning closeness with other characters from the original character.
3. Corrected is point declaration reflects the indicators but have typographical errors or errors of the word.

After the repair and return validated, point declaration on validation one gets a score of 2 has been changed to a score of 3 to a high category. In the second validation is still no input and suggestions from the validator is the addition of the word physics at every point declaration. From the results of the validation-2 there is a character who got a score of 3.25 with a very high category there are 2 that toughness and think logically while 16 other characters got a score below 3.25 with the high category.

**CONCLUSIONS**

Obtained from this study that the researchers have developed learning device has been validated twice by six validator. Of research has demonstrated the validity of learning characterized by high category, while the validity of the assessment instrument is also a category of high character, empirical test results obtained Cronbach alpha values for character assessment instruments 0.966 larger than the table r 0.433, meaning that the instrument is reliable. Thus it can be interpreted that the physical science learning (syllabi, lesson plans, worksheets and tests formative) and assessment tools character using character learning in general declared invalid by the validity index 100%, so that the learning is declared fit for use as a learning instrument in school.

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