

## VALIDITY OF LEARNING TOOLS TO MEASURE CRITICAL THINKING SKILLS OF MADRASAH TSANAWIYAH STUDENTS

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**Abstract:** The success of a teaching process cannot be separated from the learning tools used, one of the requirements is that the learning tools must be valid. The success of a teaching process is measured by the extent to which students can master the subject matter presented by the teacher. A learning model is needed that can make it easier to develop critical thinking skills so that a truly valid learning tool is obtained to measure the potential and skills that exist in students. Among the learning models that emphasize the process of seeking and finding is the inquiry model. This study aims to prepare in measuring critical thinking skills of Madrasah Tsanawiyah students. The Learning Toolkit has been validated by 3 experts and will then be averaged to find the final score. The values obtained will be entered into the validation criteria table based on the validation criteria table and the results are that the tools made are very valid and can be used in the teaching and learning process because previously the tools made have been revised several times.

**Keywords:** validity, learning tools, critical thinking skills

## **PRELIMINARY**

One of the many problems facing our education world is the problem of the weakness of the learning process. Students are less encouraged to develop thinking skills (Putri et al., 2021). Students only memorize concepts and are less able to use the concept if they encounter problems in real life. Furthermore, students are less able to determine problems and formulate them (Fahmi, 2016).

Many criticisms are directed at the way teachers teach which places too much emphasis on mastering a number of information or mere concepts. In fact, to achieve educational goals, teachers are the spearhead of implementing education in the field. Ideally the curriculum without being followed by the teacher's ability to implement it in the activities of the educational process, then the curriculum will have no meaning. Teachers need to understand and live up to the standard principles of the educational process (Fahmi and Irhasyurna, 2019).

The implementation of a competency-based curriculum is largely determined by the ability of the teacher. The teacher is an important component, because the success of the implementation of the educational process is very dependent on the ability and quality of a teacher. One of the abilities that must be possessed by a teacher is to plan learning programs contained in learning tools. The importance of planning learning tools according to Wahyudi (2014) are; 1) as a learning guide, 2) as a minimum standard of teacher performance, 3) teacher performance improvement, and 4) teacher performance evaluation tool.

According to Sanjaya (2006), there are several advantages that teachers get as planners for the learning process, including:

1. Through careful planning, teachers will avoid success by chance.
2. Through systematic planning, each teacher can describe the various obstacles that may be faced so that they can determine various strategies that can be done to achieve the expected goals.
3. Through the planning system, the teacher can determine various steps in utilizing various existing sources and facilities to achieve goals.

The success of a teaching process cannot be separated from the learning tools used, one of the requirements is that the learning tools must be valid. The problem that was then encountered was the learning tools that were arranged to measure the critical thinking skills of Madrasah Tsanawiyah students whether they had met the standard of validity or not. The success of a teaching process is measured by the extent to which students can master the knowledge conveyed by the teacher. A learning model is needed that can facilitate the development of students' critical thinking skills so that valid learning tools are obtained to measure the potential and skills that exist in students. Among the learning models that emphasize the search and find process is the inquiry model (Af'idayani et al., 2018; Rahayu et al., 2018).

The inquiry model is a series of learning activities that emphasize critical and analytical thinking processes to seek and find answers to the problems in question. Students are given the widest opportunity to do scientific work, pour scientific work (thinking skills) and be accompanied by bills or evaluations (minds-on). According to Glaser as quoted by Kowiyah (2012) critical thinking as 1) an attitude of wanting to think deeply about problems and things that are within the range of one's experience; 2) knowledge of methods of examination and logical reasoning; and 3) some kind of skill to apply the methods. According to Zaini and Asnida (2015) learning in a natural environment using an environmental approach plays an important role in learning a biological concept because it can motivate students to teach biological concepts and thinking skills. Nur (2011) explains that learning process skills is not limited to being done in schools in whole classes, but can be carried out in small groups, or individually. Students can begin working individually in class or at home, then discuss their strategies and results in small groups or the whole class. When students carry out work procedures, they have carried out scientific work and produced performance skills. The results of work (observations and investigations and processed in the form of tables, graphs, then he has at least implemented critical thinking skills. Even he is able to work on questions based on his experience in scientific work, so students have implemented critical thinking skills.

The most effective way to develop critical thinking skills is to include them as part of every lesson. Teaching critical thinking is an ongoing process. This cannot be limited to classroom sessions, but must be incorporated through a variety of questions, lessons, and activities that focus on higher-level thinking skills (Reddington, 2012). Higher order thinking skills include critical thinking, logical,

reflection, metacognitive, and creative thinking (King, 1997). Active learning involving students usually includes this skill component. Critical thinking skill is one that is expected to be mastered by students in the learning process.

Arends (2012) states that effective critical thinking requires several skills that will help determine the accuracy of information and will assist in recognizing illogical and/or erroneous arguments. According to Facione (1998) there are several skills that can be categorized as part of critical thinking skills. These skills are expertise in interpretation, analysis, inference, evaluation, explanation, and self-assessment. If the student has mastered one of these skills, then he has led to critical thinking skills even though he still does not fulfill all the skills mentioned above.

Nur (2013) distinguishes five kinds of critical thinking skills as shown in Table 1.

Table 1. Core skills and sub-skills of critical thinking

| No | Skill           | Sub-Skill                                                                           | Description                                                                                                                                                                                                                                                                                                                                                           |
|----|-----------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Interpretation  | Categorization<br>Significance decoding<br>Clarification of meaning                 | Understand and express the meaning or significance of various experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures or broad criteria.                                                                                                                                                                                            |
| 2. | Analysis        | Review of ideas<br>Argument identification<br>Argument analysis                     | Identify inferential relationships between statements, questions, concepts, descriptions, data or other forms of representation intended to express beliefs, judgments, experiences, reasons, information, or opinions.                                                                                                                                               |
| 3. | Evaluation      | Assessing claims<br>Judging arguments                                               | Assess the credibility of statements or other representations that provide an explanation or description of a person's perceptions, experiences, situations, considerations, beliefs, or opinions; and to assess the logical strength of actual or intended inferential relationships including statements, descriptions, questions or other forms of representation. |
| 4. | Inference       | Questioning the evidence<br>Guess the alternative<br>Draw a conclusion              | Identify and define the elements needed to draw reasonable conclusions; formulate conjectures and hypotheses; consider relevant information and derive the consequences that flow from data, reports, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other forms of representation.                                        |
| 5. | Eksplanation    | Declare results<br>Justify the procedure<br>Presenting arguments<br>Self correction | Stating the results of reasoning, justifying the reasoning based on considerations of evidence, concepts, methodology, criteria and context; and present reasoning in the form of convincing arguments.                                                                                                                                                               |
| 6. | Self-regulation | Self-assessment<br>Self correction                                                  | Consciousness helps one's own cognitive activities, the elements involved in these activities, the results obtained, especially by applying the skills of analyzing and evaluating one's own performance.                                                                                                                                                             |

Source: Executive Summary "The Delphi Report" by Dr. Peter A. Facione. 1990.

Efforts to improve critical thinking skills through; 1) reading skills, 2) listening skills, 3) observing skills, 4) analyzing skills. Improving critical reading skills is carried out by (a) underlining the main idea that is read, (b) studying together and matching whether the main idea made is the same as the other group members, (c) writing what is the main idea in a reading in words. alone. Critical listening skills, exercised by (a) making important points, (b) focusing on what the speaker is saying and hearing the main or key points.

Critical observing skills, implemented by (a) removing some of the limitations that exist in the mind, (b) limiting or reducing some distractions, (c) asking yourself whether you have understood what is the most important point, (d) creating alternatives in observing something, (e) always look outside the situation. Critical analysis skills, implemented by (a) maintaining some clear and accurate logic, (b) taking all details into consideration, (c) using systematic and scientifically-based processes, (d) using cognitive and psychomotor skills.

## METHOD

Development research uses the Tessmer model (Tessmer, 1998). Development research produces learning device products (Syllabus, RPP, LKPD, and Teaching Materials) the Tessmer model as shown in Figure 1.

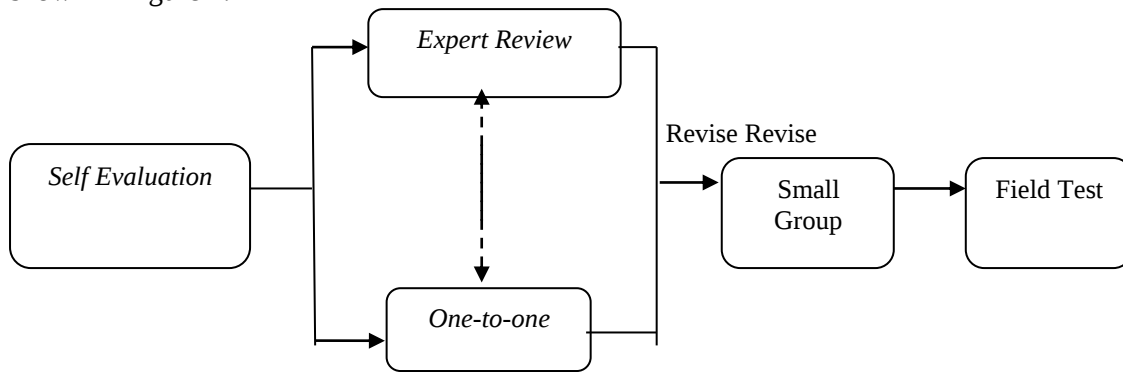


Figure 1. Formative evaluation design

This research was conducted from February to May 2020 at Madrasah Tsanawiyah Negeri Barabai. Experts come from a team of lecturers who are at least qualified in the field of education. Revisions from three experts were used as material to be tested in individual tests.

## RESULTS AND DISCUSSION

### Syllabus Validation Results

The syllabus produced in this development contains identity, core competencies, basic competencies, indicators, learning materials, learning activities, assessments, time allocation, and learning resources. The value obtained from the three experts regarding the syllabus made is categorized as very valid after several revisions (Figure 2) and can be used in the teaching and learning process.

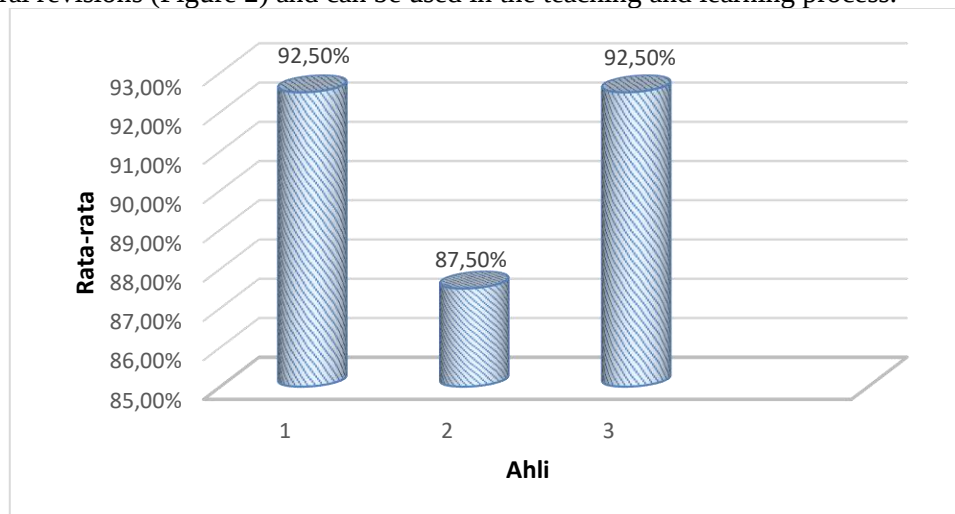


Figure 2. The results of the average opinion of the expert team on the syllabus

### Learning Implementation Plan Validation Results

Learning Implementation Plan is a guide used by teachers in the implementation of the teaching and learning process. RPP consists of Core Competencies, Basic Competencies, Indicators, Learning

Objectives, Learning Materials, Learning Models (in the form of learning scenarios by following the Inquiry Model syntax), Learning Activities, and Evaluations using the Assessment Sheet format.

The Learning Implementation Plan in this study consisted of one Basic Competency which was divided into five meetings. The value obtained from the three experts is in the very valid category after several revisions (Figure 3) and can be used in the teaching and learning process.

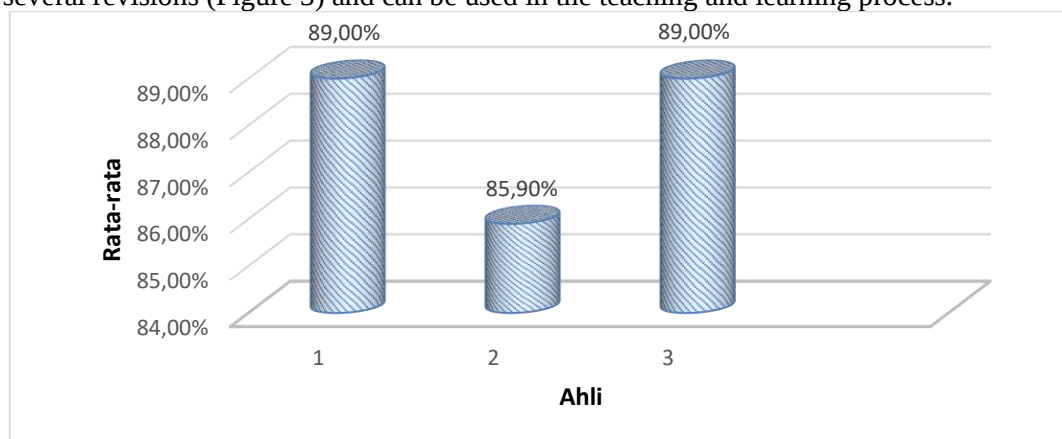


Figure 3. The results of the average opinion of the expert team on the implementation of learning

### Teaching Material Validation Results

The teaching materials developed are the concept of energy in living systems which are materials used by students to help their understanding during the teaching and learning process or there are tasks that must be done outside of school hours. These teaching materials contain learning instructions, Basic Competencies, Learning Objectives, Lesson Materials, pictures, critical thinking exercises, discovery activities, summaries, evaluations and bibliography. The results of the assessments of the three experts were categorized as very valid after several revisions were made (Figure 4) and could be used in the teaching and learning process.

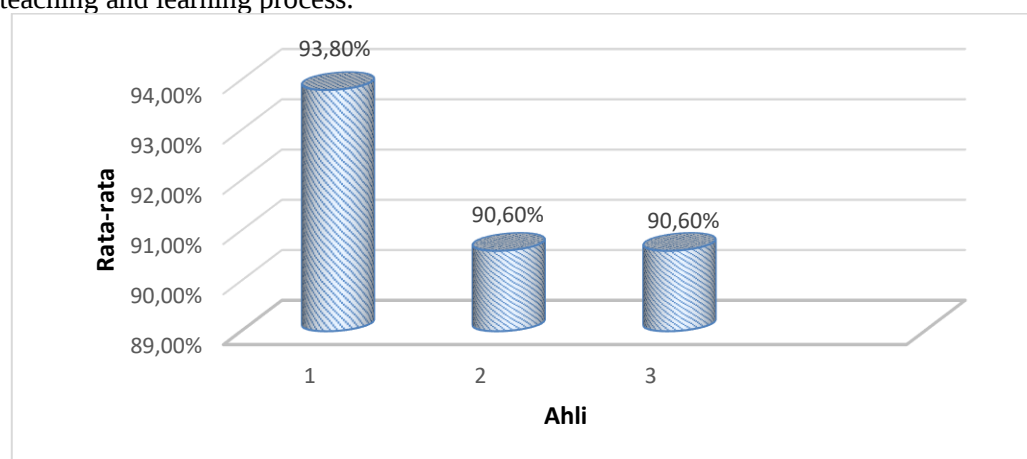


Figure 4. The results of the average opinion of the expert team on teaching materials

### Student Worksheet Validation Results

The Student Worksheets (LKS) developed in this study consisted of five LKS, namely LKS 1 on Energy and energy sources, LKS 2 on Photosynthesis, LKS 3 on Energy Transformation, LKS 4 on Respiration in insects, and LKS 5 on Tests. food.

Worksheets are used to assist students in doing various tasks according to the material being discussed. The LKS developed contains the syntax of the inquiry model which is new for students. This worksheet trains students to carry out their own investigations to help them find concepts based on their own findings even though they are still under the guidance of the teacher.

The value obtained from the three experts is in the very valid category after several revisions (Figure 5) and can be used in the teaching and learning process.

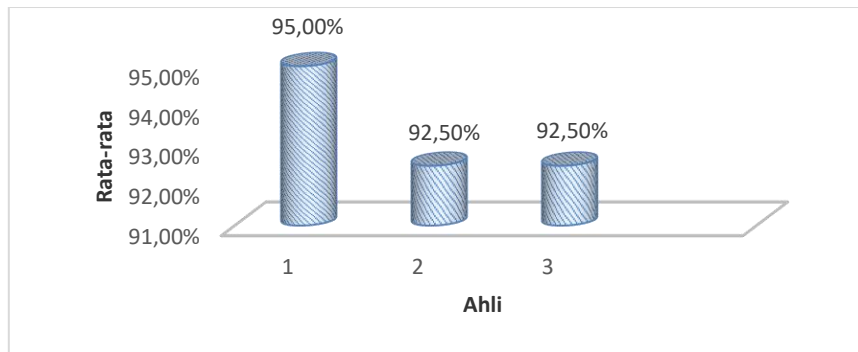


Figure 5. The results of the average opinion of the expert team on student worksheets

### Learning Media Validation Results

Learning Media developed in this research is in the form of Power Point. Power Point is used to assist students in making it easier to understand the material being discussed, namely the concept of energy in life at the five meetings because it contains summaries of the material. The value obtained from the three experts is included in the very valid category after several revisions (Figure 6) and can be used in the teaching and learning process.

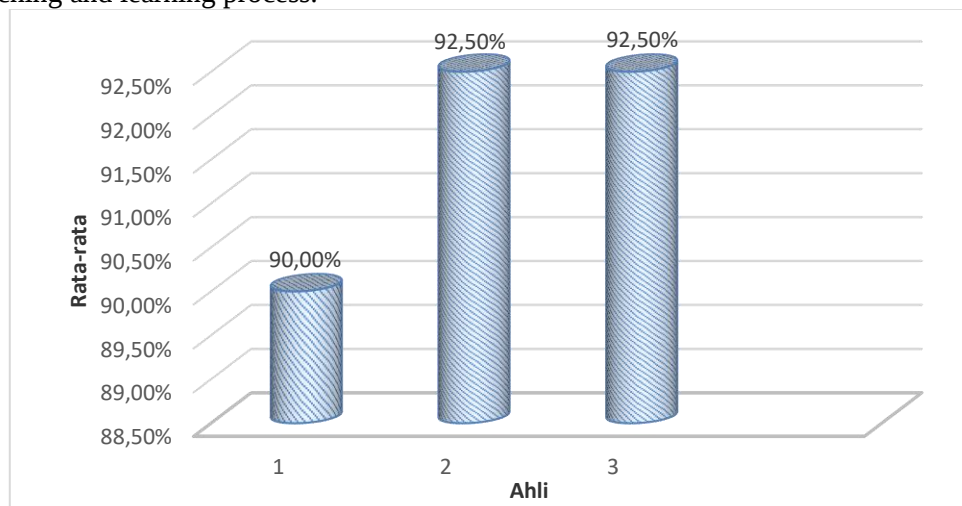


Figure 6. The results of the average opinion of the expert team on learning media

### Assessment Sheet Validation Results

The Assessment Sheet developed in this study consisted of a Specification Drawing or an Assessment Sheet grid, a Product Assessment Sheet (LP 1), a Process Assessment Sheet (LP 2), and a Psychomotor Assessment Sheet (LP 3), which were assessed by experts while the Character Behavior Assessment (LP 4), Social Skills Assessment Sheet (LP 5), and Critical Thinking Skills Assessment Sheet (LP 6) were not assessed by experts because there was already a provision based on the Ministry of National Education, namely Assessment of Learning Outcomes. The value obtained from the three experts is in the very valid category after several revisions (Figure 7) and can be used in the teaching and learning process.

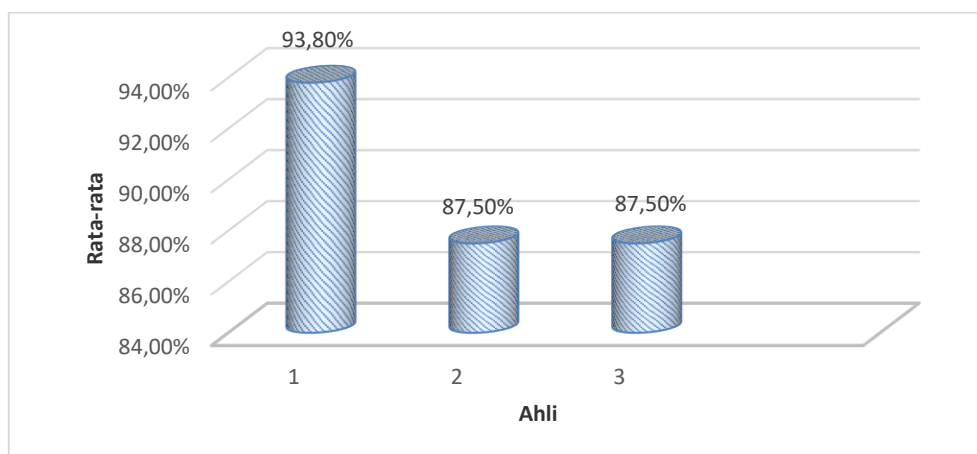


Figure 7. The results of the average opinion of the expert team on product and process assessment

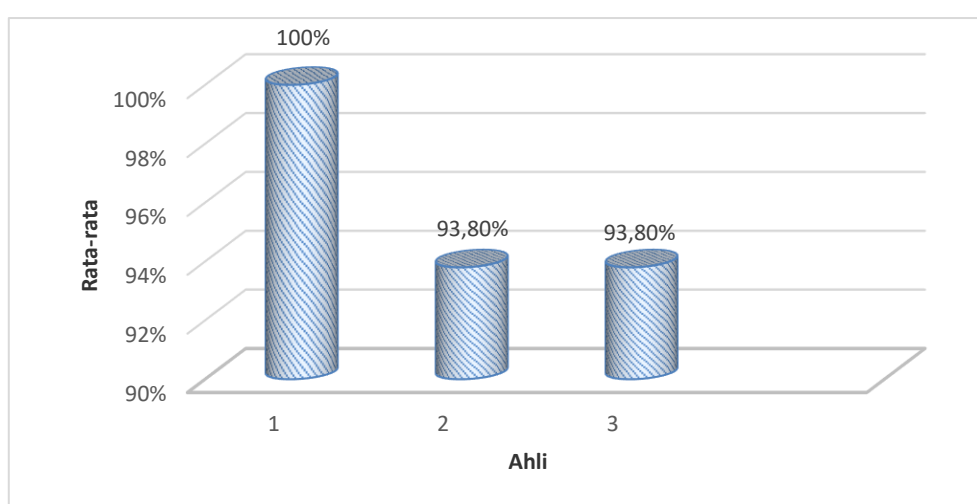


Figure 8. The results of the average opinion of the expert team on psychomotor assessment

The inquiry model learning tool has received input from experts after being validated in terms of content, format, and readability. Inputs/suggestions from experts are presented in Table 2.

Table 2. Expert input/suggestions on learning tools

| No. | Feedback/Suggestions from Experts                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | After Revision                                                                                                                                                                                                   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Mr. Prof. Dr. Muhammad Zaini, M.Pd<br>Make the device according to the applicable conditions                                                                                                                                                                                                                                                                                                                                                                                                        | Membuat perangkat sesuai dengan ketentuan yang berlaku                                                                                                                                                           |
| 2   | Mrs. Ita, M.Pd<br>a. Make a bibliography on the syllabus<br>b. The shape of the instrument with the example of the instrument in the syllabus is corrected<br>c. Complete school ID<br>d. Improve the writing procedure on RPP<br>e. Consistent use of the word student or student<br>f. Be consistent in writing LKS or LKPD<br>g. The layout of teaching materials should be made more interesting<br>h. The media in PPT has not fulfilled all the learning objectives and there are no pictures | Bibliography has been included<br>Already repaired<br>Already equipped<br>Already repaired<br>Consistent use of student words<br>Consistent use of worksheets<br>Already repaired<br>Fixed and included pictures |
| 3   | Mrs. Ayatussa'adah, M.Pd<br>a. The syllabus has not explicitly included the inclusion of learning activities<br>b. Check again the degree in the formulation of learning objectives                                                                                                                                                                                                                                                                                                                 | Learning activities have been included<br>Already repaired                                                                                                                                                       |

|    |                                                                                                                                                                           |                                |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| c. | Have not included tools and materials in learning                                                                                                                         | Included tools and materials   |
| d. | Create indicators on RPP                                                                                                                                                  | Indicator already created      |
| e. | In the teaching materials add a summary, bibliography, the letters are enlarged according to MTsN children                                                                | Already repaired               |
| f. | In the learning media, add pictures, add inquiry steps and make teaching materials as attractive as possible so that students are interested in paying attention to them. | Image added                    |
| g. | In the LKS add the source and check the writing again                                                                                                                     | Already repaired               |
| h. | In LP 1 add bibliography                                                                                                                                                  | Bibliography has been included |

Source: Results of data processing

The assessment of the feasibility of learning tools was carried out by three experts, namely Prof. Dr. Muhammad Zaini, M.Pd, Ita M.Pd and Ayatussa'adah, M.Pd. Assessment is carried out on the syllabus, lesson plans, worksheets, teaching materials, learning media, and assessment sheets. The object of the assessment includes the format, language, illustrations and content that are adapted to the thinking level of class VII students in MTs.

In this study, we have succeeded in developing a learning device on the topic of energy in a guided inquiry model of living systems, but the resulting device still needs more in-depth revision and wider testing so that the resulting product will be even better. Proof of a teacher's competence is how he is able to guide and create a learning process in order to achieve the competency targets to be achieved. In addition to the ability of students to understand the material, the most important thing is that the objectives of learning can be achieved, so that in the end quality teachers will be produced (Fahmi et al., 2021).

Learning Tools that have been validated by three experts will then be averaged to find the final score. The values obtained will be entered into the validation criteria table based on the validation criteria table and the results are that the tools made are very valid and can be used in the teaching and learning process because previously the tools made have been revised several times.

## CONCLUSION

Based on the results of the study, it was concluded that the learning device on the topic of Energy in Living Systems using the guided inquiry model developed was feasible to use, meaning that it was very valid after several revisions.

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## **KEVALIDAN PERANGKAT PEMBELAJARAN UNTUK MENGUKUR KETERAMPILAN BERPIKIR KRITIS SISWA MADRASAH TSANAWIYAH**

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**Abstrak:** Keberhasilan suatu proses pengajaran tidak terlepas dari perangkat pembelajaran yang digunakan, salah satu persyaratan adalah perangkat pembelajaran harus valid. Keberhasilan suatu proses pengajaran diukur dari sejauh mana siswa dapat menguasai materi pelajaran yang disampaikan guru. Diperlukan suatu model pembelajaran yang dapat memudahkan dalam mengembangkan perangkat keterampilan berpikir kritis sehingga didapatkan suatu perangkat pembelajaran yang benar-benar valid untuk mengukur potensi dan keterampilan yang ada pada diri siswa. Diantara model pembelajaran yang menekankan kepada proses mencari dan menemukan adalah model inkuiri. Penelitian ini bertujuan untuk mempersiapkan dalam mengukur keterampilan berpikir kritis siswa Madrasah Tsanawiyah. Perangkat Pembelajaran sudah divalidasi oleh 3 orang ahli kemudian akan dirata-ratakan untuk mencari nilai akhir. Nilai yang didapat akan dimasukkan ke dalam tabel kriteria validasi berdasarkan tabel kriteria validasi dan hasilnya perangkat yang dibuat termasuk sangat valid dan dapat digunakan dalam proses belajar mengajar karena sebelumnya perangkat yang dibuat sudah dilakukan beberapa kali revisi.

**Kata kunci:** kevalidan, perangkat pembelajaran, keterampilan berpikir kritis