Development and application of national exam based teaching materials for junior high school students using national education standard

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Abstract. Education is one of life aspect is currently required in 2013--revised in 2017--curriculum to have skills that must collaborate in realizing students who have character and have scientific insight. In the process of learning science at the unit level of education, especially the junior secondary level in biology, there is still a demand and need from practical aspects to improve teaching materials that are updated to increase student competency. The purpose of this study is to improve the competency of students based on the national examination results of students during the last 3 years from 2016 to 2018 decreased in percentage. This research was conducted by a descriptive research method. The subjects of this study were students of class XI in Surakarta Junior High School. Data on the results of national examinations for the last 3 years were collected using the National Education Assessment Center (PusPenDikNas) data and analyzed using the National Education Standard (SNP) instrument of 8 Standards. The results of the analysis of teaching materials used in these schools indicate that the highest percentage of gab or problems in the standard process is 2.78%. This shows that teaching materials that are still used in schools need to be improved, therefore teaching materials must be a concern in the learning process of student science.

1. Introduction

The education system starting at the elementary, secondary and high school units is highly developed when determined in terms of evaluation and monitoring. Because the quality of education is a benchmark for increasing human resources for the development of national education in Indonesia. Learning in the 21st century according to Andone & Frydenberg should be held in a collaborative, creative, and innovative way [1]. In other words, teachers should plan and prepare holistically to facilitate students in contextual, participatory, active, and creative learning [4]. Current advances in education are very influential in 21st Century learning based on high-level thinking. Stating that 21st
Century learning needs to be developed a learning and innovation skills include communication, collaboration, critical thinking and problem solving as well as creativity and innovation [2].

The quality and relevance of education are reflected in an ability to shape the skills of graduates to become productive workers and create innovations in the realm of education. Utilization of science and technology (IPTEK) can be a tool to improve life skills following the principles of lifelong learning. Activities provided by 21st-century skills can be presented in textbooks such as learning modules. The learning model as a textbook is also appropriate with the definition of the 2013 curriculum where students are required and levitated to seek knowledge from various sources when they are learning science at school Pamula [5].

One reason for the low quality of graduates is an ineffective learning process. The learning process so far is still too oriented towards the mastery of theory and memorization in all fields of study which causes the learning ability of students to be inhibited. Learning methods that are too teacher-oriented tend to ignore the rights and needs, as well as the growth and development of children so that the learning process that is fun, exciting, and educating becomes less optimal.

The teaching materials used are still not optimal, this is the significance of this study because it requires deep analysis to determine the design of developing teaching materials using the results of national examination held in junior high school in Surakarta. Besides, the national examination as a basis for measuring the ability of students in Muhammadiyah Surakarta Special Program Junior High School which for the last 3 years has become the center of attention. The National Education Assessment Center updates the results of the national examinations administered by the ministry of education and culture. Then the data forms the basis for evaluating the learning process.

2. Method
According to the Ministry of Education and Culture (2013), assessment in 2013--revised in 2017--curriculum emphasizes the level of student thinking ranging from low to high. Critical thinking skills are high-level thinking skills that refer students to formulate and evaluate their own beliefs and opinions Brookhart [3]. Also, critical thinking skills are defined as skills that can create an intelligent thinker and an appropriate solution provider (Fascione, 2011). Widana states that the HOTS assessment can be measured by the ability to think not just remember [10]. HOTS assessment is measured by ability namely: 1) Conveying concepts from one person to another, 2) Processing and implementing information, 3) Finding different sources of information, 4) Using information to solve problems, and 5) Reviewing ideas and information critically.

The research aims to improve the competency of students based on the results of students' national exams over the past 3 years, namely from 2016 to 2018, which has decreased in percentage. The subjects of the study were 90th-grade students of SMP in Surakarta with 90 students. The study was conducted by a descriptive method. The instrument used was the standard SNP 8 and the results of the absorption of national examinations in 2016, 2017 and 2018 material for living things and their environment with the same indicators in the year in sequence. 8 standards taken for data include standards for content, processes, competencies of graduates, educators, and education personnel, facilities and infrastructure, management, financing, and assessment. In this case, the biggest percentage of problems or gab is the process standard of 2.78%. The 8 standards each have more than one indicator. The content standard has 8 indicators, a process standard of 10 indicators, 12
competency standards for graduates, indicators for educators and educational staff 11 indicators, facilities and infrastructure standards 11 indicators, management standards 4 indicators, financing standards 3 indicators and assessment standards 13 indicators. Collecting data in this study using literature studies through data from the National Education Assessment Center, direct interviews and filling out questionnaires by education practitioners in the Muhammadiyah Junior High School.

3. Results and Discussion
The incidence of increasing student competency based on student UN results over the past 3 years is from 2016 to 2018 has decreased in percentage. This is directly proportional to the ability to think critically in children, namely educating children to communicate their thoughts, solve problems and be able to sort out information received correctly [11]. The characteristics of a critical attitude in a person that is showing a high curiosity. Research conducted by Nuryanti that critical thinking skills must be possessed by students to face various personal and social problems in their lives [9].

The results of the National Education Standards (SNP) and GAP questionnaires for each standard are presented in Table 1.

| Table 1. Results on the Percentage of Eight Indicators of SNP and GAP |
|-----------------------|-----------------------|
|                      | GAP (%) | SNP (%) |
| STANDARD 1           | 1.85     | 9.26    |
| STANDARD 2           | 2.78     | 11.11   |
| STANDARD 3           | 0.46     | 16.20   |
| STANDARD 4           | 1.39     | 13.89   |
| STANDARD 5           | 1.39     | 13.89   |
| STANDARD 6           | 0.46     | 5.09    |
| STANDARD 7           | 0.93     | 3.24    |
| STANDARD 8           | 0.46     | 17.59   |
| TOTAL                | 9.72     | 90.28   |

From the table above it can be seen that the percentage value on standard 2 or standard process has a gap value of 2.78%. This is obtained from 10 indicators on the process standard, namely: 1. The lesson plan is translated from the syllabus; 2. Preparation of lesson plans by the teacher; 3. Implementation of learning refers to the RPP; 4. Monitoring the learning process by the principal; 5. Aspects supervised by the principal; 6. Submission of supervision results by the School Principal; 7. Implementation of follow-up supervision results; 8. Learning media; 9. The use of IT in the learning process; 10. The presence or absence of remedial teaching. Therefore it is necessary to improve the preparation and implementation of learning.

The results of the National Education Standards (SNP) and GAP questionnaires for each standard are presented in Figure 1.
Figure 1. Results on SNP and GAP of National Education Standard

From Figure 1 it can be seen that the GAP of 2.7% and the SNP value of 11% occur in standard 2. Table 1 and Figure 1 show that the process standard that occurs in SMP Muhammadiyah PK in Surakarta is still relatively high. Therefore teaching materials used still need to be improved to reduce the gap that occurs. Besides, the indicators in the standard process must also be monitored and evaluated. That the value of the GAP and SNP has to do with increasing the absorption of students' national examinations.

Data from the National Education Assessment Center the absorption capacity of the national SMP Muhammadiyah PK 2016 is presented in Figure 2 [6].

Figure 2. Data from the National Education Assessment Center 2016

Data from the National Education Assessment Center the absorption capacity of the national SMP Muhammadiyah PK 2017 is presented in Figure 3 [7].
Figure 3. Data from the National Education Assessment Center 2017

Data from the National Education Assessment Center the absorption capacity of the national SMP Muhammadiyah PK 2018 is presented in Figure 4 [8].

Figure 4. Data from the National Education Assessment Center 2018
The three data captured by the national education assessment center for 3 years in a row showed that the percentage in education units with the same indicators decreased from 96.23% in 2016, then 86.67% in 2017 and 58.33% in 2018. This has decreased the level of students' absorption of indicators on the material of living things and their environment. This decrease is quite significant from 86.67% to 58.33% having a difference of 33.34%.

4. Conclusion
The competence of students can be increased by evaluating and improving the quality of teaching materials to support the learning system in the revolutionary 4.0 era so that the gaps are smaller and the absorption capacity of national exams can increase better.

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