Developing Supplementary Book for Constructing Tests with Minimum Competency Assessment for Elementary Schools Teachers

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Abstract

The government through the Ministry of Education and Culture launched a new policy that was quite controversial, abolishing the National Examination and replacing it with a new assessment mechanism, namely the Minimum Competency Assessment (*Asesmen Kompetensi Minimum,* abbreviated as *AKM*). The implementation of *AKM* has elicited various responses from schools, teachers, and the community. One of the responses that emerged was confusion regarding the concepts, mechanisms, and forms of questions in the *AKM*. This study aims to answer these issues, by developing a supplementary book for preparing *AKM*-based questions. This study is developmental research by adapting the Borg and Gall model. There were four stages in this study, including planning, developing, try-out, and dissemination. Data collection technique used questionnaires, interviews, and observations. Quantitative data from the questionnaire were analysed using percentage analysis techniques. While the qualitative data used were descriptive analysis techniques. Based on the results of the validation and try-out had been carried out, this supplementary book can be said to be valid and worthy of distribution. The validity test and try-out of prospective users showed that the product that had been developed provides benefits for teachers. The supplementary book for preparing *AKM*-based questions is a product that can provide information about technical steps for teachers in developing learning evaluation models. However, some improvements still need to be made following the suggestions obtained from the validators and potential users.

Keywords: *minimum competency assessment, supplementary book, teacher, elementary school.*

Abstrak

Pemerintah melalui Kementerian Pendidikan dan Kebudayaan meluncurkan kebijakan baru yang cukup kontroversial, yaitu meniadakan Ujian Nasional dan menggantinya dengan mekanisme penilaian baru, yaitu Asesmen Kompetensi Minimum (AKM). Implementasi AKM menuai berbagai tanggapan dari pihak sekolah, guru, dan masyarakat. Salah satu tanggapan yang muncul adalah kebingungan mengenai konsep, mekanisme, dan bentuk soal dalam AKM. Penelitian ini bertujuan untuk menjawab permasalahan tersebut, dengan mengembangkan buku pelengkap penyusunan soal berbasis AKM. Penelitian ini merupakan penelitian pengembangan dengan mengadaptasi model Borg and Gall. Ada empat tahapan dalam penelitian ini, yaitu perencanaan, pengembangan, uji coba, dan diseminasi. Pengumpulan data menggunakan angket, wawancara, dan observasi. Data kuantitatif dari kuesioner dianalisis dengan menggunakan teknik analisis persentase. Sedangkan data kualitatif dianalisis dengan menggunakan teknik analisis deskriptif. Berdasarkan hasil validasi dan uji coba yang telah dilakukan, maka buku pelengkap ini dapat dikatakan valid dan layak edar. Uji validitas dan uji coba calon pengguna menunjukkan bahwa produk yang dikembangkan memberikan manfaat bagi guru. Buku pelengkap penyusunan soal berbasis AKM merupakan produk yang dapat memberikan informasi tentang langkah-langkah teknis bagi guru dalam mengembangkan model evaluasi pembelajaran. Namun demikian, beberapa perbaikan masih perlu dilakukan mengikuti saran yang diperoleh dari validator dan calon pengguna.

Kata kunci: *asesmen kompetensi minimum, buku suplemen, guru, sekolah dasar.*

INTRODUCTION

The government through the Ministry of Education and Culture launched a new policy that was quite controversial, abolishing the National Examination and replacing it with a new assessment mechanism, namely the Minimum Competency Assessment (*Asesmen Kompetensi Minimum,* abbreviated as *AKM*) and Character Survey. Both are an integral part of the National Assessment along with the Learning Environment Survey. This policy will be implemented effectively in 2021 (Wardani et al., 2021). In this latest assessment mechanism, students' cognitive abilities are no longer the dominating domain of the National Examination. However, the assessment will focus on measuring the minimum ability of students in literacy and numeracy (Sari et al., 2021; Sari & Rosa, 2021). The determination of the AKM focus on measuring reading and literacy of numeracy is motivated by the low literacy rating of Indonesian students (ranked 74 out of 79 countries) based on the 2018 PISA (International Program for Student Assessment) report (Cahyanovianty & Wahidin, 2021; Imron, 2021; Mubarok & Anggraini, 2020; Putri & Umah, 2020; Sholeh & Priatmoko, 2020).

Since being implemented through the Decree of the Minister of National Education Number 153/U/2003 dated October 14, 2003, the National Examination has received various responses from various groups (Asra & Mahatir, 2021; Hidayah, 2020; Rosidin et al., 2019; Tju & Murniarti, 2021). The Ministry of Education and Culture stated that 2020 is the last

year of implementing the National Exam as a determinant of student graduation. Starting in 2021, the National Examination will be replaced with a National Assessment where one of the components is the Minimum Competency Assessment (*AKM*). The counter-attitude of various groups towards the National Examination is aimed at several aspects (Silverius, 2010). First, the orientation of the National Exam tends to be cognitive-oriented. Learning outcomes also include two other domains, affective and psychomotor (Yuliandari & Hadi, 2020). This is certainly not following the mandate of Article 35 paragraph 1 of Law Number 20 of 2003 concerning the National Education System. Therefore, the results of the National Exam are not representative enough to describe the learning outcomes of students (Murtiana, 2011).

Second, the implementation of the National Exam does not pay attention to the diversity of student potential, regional conditions and characteristics. Third, the centralized characteristics of the National Exam are considered to ignore the rights and obligations of teachers to conduct learning evaluations for students. Whereas,in Article 61 paragraph 2 of the National Education System Law, the authority to graduate students belongs to the teacher and the education unit. Fourth, concerning to the quality of education, the National Exam only measures student learning outcomes. Meanwhile, the quality of education units and systems is not evaluated. Fifth, the National Exam is given at the end of the level (Silverius, 2010). Thus, students who do the National Exam do not have the opportunity to feel the improvement in the learning system. Thus, the National Exam cannot carry out the mandate of Article 58 paragraph 1 of the National Education System Law which emphasizes the function of evaluation as a material for continuous quality improvement (Sutari, 2016).

The facts above show that the assessment has only been used as a tool to evaluate the learning series, not in the learning process (Wiliam, 2011). Assessment plays an important role in the learning process, student motivation, and learning strategies (Simms & George, 2014; Zeng et al., 2018). The assessment also serves as quality assurance. The results of the assessment can be used by the teacher to improve the quality of learning in the classroom (Harlen, 2007).

The abolition of the National Exam and its replacement with the National Assessment raises new problems, thus encouraging academics to study them. For example, there are pros and cons, teacher unpreparedness, and doubts about the quality of *the AKM* measuring instrument and the Character Survey as expressed by Sari et al., (2021). Several previous studies indicate the potential for new problems to arise that accompany the implementation of this policy. Rokhim et al., (2021), in their study found 53.2% of students and 25% of teachers who were respondents did not understand National Assessment. The same findings were more

or less produced by a study conducted by Novita et al., (2021), 51% of teachers did not understand National Assessment. However, based on the findings of Aisah et al. (2021), the Ministry of Education and Culture has carried out the socialization of the National Assessment to the community well. This policy has been well received by parents of students.

The lack of school readiness is also shown by Aunurrahman (2020). The principal has not taken the initiative to maximally encourage teacher involvement to understand the new policy. In addition, teachers are also less proactive in seeking information or increasing knowledge related to minimum competency assessment policies and character surveys through various available information sources. In supporting school readiness, Rini & Solehah (2021) researched on the development of e-modules for online training. Through online exercises, students will get used to answering AKM questions.

This study is intended to complement the previous studies described above. However, the focus of this study was directed at developing a supplementary book that serves as a support for teachers in understanding and compiling *AKM*-based questions. As it is known that one of the main competencies of teachers is professional competence where the ability to evaluate learning is one of its component. Regulation of the Minister of National Education Number 11 of 2005 Article 2 explains that to achieve national learning objectives, in addition to using textbooks as mandatory references, teachers are also given space to use supporting books in the learning process, such as supplementary books (Abdillah et al., 2020; Jamhari et al., 2018). The product of this study is expected to be able to encourage the development of the teacher's competence to support the implementation of *AKM*.

METHODS

This research and development study adapts the Borg and Gall model. There were 10 steps taken, namely 1) research and information collecting; 2) planning; 3) developing a preliminary form of product; 4) preliminary try-out; 5) main product revision; 6) main filed try out; 7) operational product revision; 8) operational filed try out; 9) final product revision; 10) dissemination and implementation (Effendi & Hendriyani, 2018).

Referring to these 10 steps, the researcher established four development procedures. First, the planning stages included collecting information as initial data, determining research potential and problems, and determining products following the research objectives. The focus of observation at this stage is the difficulty felt by elementary school level teachers in developing AKM questions. Researchers at this stage openly ask prospective product users about their readiness to carry out a minimum competency assessment (AKM), especially in developing questions that are by standards.

The second, is the development stage. This stage included determining product development goals, compiling product designs in the form of prototypes, compiling product evaluation tools, initial tryout, and revising the results of the initial tryout. At this stage, the product prototype has not been mass disseminated. The supplement book is still in the form of an initial product whose validity has not been tested. The general specifications of the supplementary book produced in the form of this prototype include (1) the cover of the book; (2) introduction; (3) table of contents/list of tables/list of figures/and so on; (4) materials and enrichment; (5) cover; and (6) a list of references.

The field try-out phase included the preparation of evaluation tools for the large group try-out, the large group try-out, and final product improvements. The test subjects for the large group were 20-30 elementary school teachers from the working group of teachers in each of the residency areas of Malang Raya (Malang City, Malang Regency, and Batu City). The user trial subjects came from public schools and private schools.

The dissemination stage included multiplying the product and disseminating the product. After obtaining the ISBN and producing it in a certain number of copies, the last step taken by the researcher/developer is to distribute the supplement book. The initial target recipients of the product were elementary school teachers who had previously been involved in being the subject of trials, both small group trials and large group trials.

The data in this study are divided into two categories, namely qualitative and quantitative. Qualitative data were collected using interviews and observations. The researcher used interviews to collect data regarding the perspective and readiness of the test subject to the application of AKM. The researcher used the observation method to observe the readiness of facilities and infrastructure as well as the school's academic atmosphere. Qualitative data analysis using in this study is the descriptive analysis techniques. The quantitative data is in the form of scores of assessment results by media experts and material experts on the product. This score determines the validity and feasibility of the product.

Product validity and feasibility tests were carried out at the development stage. Researchers involved two expert criteria in this stage, namely media experts and material experts. Each criterion consisted of 2 people. Thus, in total there were 4 experts involved in this development research. The experts involved come from academics (lecturers) and practitioners (teachers) with the expertise in educational technology and evaluation backgrounds. The validation test process employed two instruments in the form of a questionnaire with a rating scale of 1-5. Each instrument consisted of 20 question items. Media expert validation test instruments included product identity, appearance, and product

specifications. Meanwhile, the material expert validation test instrument included the introduction, content of the material, and closing.

The average score of each validator was obtained from the following formula:

$$P= \sum x \sum xi \text{ X } 100\%$$

P   = Percentage (%)
$\sum x$ *= Total answer scores of all respondents in one item*
$\sum xi$ *= The number of ideal scores in one item*

The interpretation and the determination of the predicate of the product being tested referred to the table of eligibility criteria described by Arikunto (2002), as can be seen in Table 1.

The try-out involved prospective users, namely teachers in elementary schools. Samples of prospective users were taken from four schools spread across the Greater Malang area. The four schools were SDN 01 Bunulrejo (Malang City), SDN 04 Panggungrejo (Malang Regency), SDN 01 Wonokerto (Malang Regency), and SDN 01 Temas (Batu City). Two teachers were taken from each school who were directly involved in the implementation of *AKM,* those in charge of fourth and fifth-grade teachers. Thus, the total sample of the try out in this study was 8 teachers.

Table 1. Product Eligibility Criteria (Source: Arikunto, 2002)

Category	Percentage	Qualification	Equivalent
A	80% - 100%	Valid	Feasible
B	60% - 79%	Moderate	Moderate
C	50% - 59%	Less Valid	Less Feasible
D	0% - 49%	Invalid	Not Feasible

A product is considered valid and feasible (Category A) to be used if it gets an ideal score of 80%-100%. If the score obtained from the validators ranges from 60%-79%, then the product is considered still quite feasible to use (Category B). As for the score of 50%-59%, the product is considered less suitable for use (Category C). If you fall into these two categories (B and C), researchers still have the opportunity to improve. Meanwhile, if the product assessment results get a score of 0%-49%, then the product is considered unfit for use (Abdillah et al., 2020; Amelia et al., 2021; Arikunto, 2002; Ernawati, 2017).

RESULTS AND DISCUSSION

Product Description

The product developed in this study was a supplementary book that aims to provide information or descriptions to teachers at the basic education level regarding the preparation of questions based on the Minimum Competency Assessment (*AKM*). This can be used to help teachers at the primary education level understand and develop their *AKM* questions. Therefore, teachers can apply it when providing learning assessments process. Through this method, students can be accustomed to working on *AKM* questions. The supplement book design used green as the main colour. There was an illustration of a student who is eager to learn. The addition of this illustration aims to eliminate the impression of being standard and formal. Thus, readers can be more comfortable when they read it. This supplement book is entitled "*AKM (Asesmen Kompetensi Minimum): Strategi Menyusun Soal untuk Siswa SD*" (*AKM* (Minimum Competency Assessment): Strategies for Developing Questions for Elementary School Students).

The content of this supplementary book has been developed by the author by referring to the guide books and technical instructions developed by the Centre for Assessment and Learning of the Ministry of Education and Culture of the Republic of Indonesia. There were three books used as references, namely (1) *AKM* Question Development Design, (2) *AKM* Question and Answer Sheet, and (3) *AKM* and Its Implications for Learning. Meanwhile, the technical instructions and examples of questions used https://pusmenjar.kemdikbud.go.id/an/.
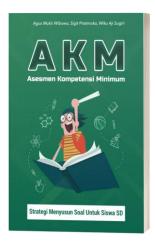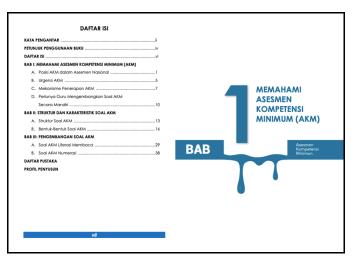

Figure 1. Front Cover

Overall, the book consists of three chapters. There is an initial section containing the cover page, the identity of the book, the introduction, instructions for use, and a table of contents. The user manual section is useful as a guide for readers in using the book. The

inclusion of this section is not only to meet the product aspect of Research and Development results, but it is also in line with this kind of book, a book that contains technical matters, not theoretical ones.

Chapter one contains a brief description of the *AKM* concept. The discussion in this chapter covers the position of *AKM* in the National Assessment. As it is known that the *AKM* has a more comprehensive function than the National Exam. Furthermore, it is also an integral part of two other components of the National Assessment, namely the Character Survey and the Learning Environment Survey. This chapter also describes the basis on which *AKM* is implemented, how urgently it is to be implemented, and the mechanism for its implementation. This description is intended to provide additional insight to users regarding the urgency and significance of developing *AKM*-based assessment questions by teachers independently.
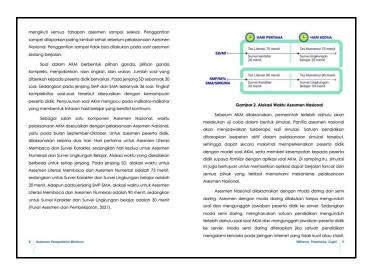

Figure 2. Product Content

Chapter two describes how the characteristics of *AKM* questions and how they are structured. If in the previous chapter the description given was still theoretical, this section starts to be technical. There are two sub-discussions in this chapter, namely the structure of the *AKM* questions and the forms of the *AKM* questions. The first sub-discussion explains the parts contained in the *AKM* questions. This description is important to enabling teachers to understand what parts must be in the *AKM* item questions and what are the special features or characteristics that distinguish them from the previous national assessment questions. Meanwhile, the second sub-discussion discusses several forms of *AKM* questions, equipped with examples of each. After reading this second chapter, the reader already has an idea of how to develop *AKM* questions.

Chapter three of the last chapter describes the technical development of *AKM* questions. The description in this chapter is divided into two sub-discussions, namely the *AKM* Reading Literacy Question and the *AKM* Numeration Question. This is in by following under the content of the *AKM* questions divided into these two categories. In each sub-discussion, there are two sub-sub-discussions, namely the text content and context. This chapter in detail describes these sections. Thus, teachers can easily understand how to develop *AKM* questions.

The last part of the book is the bibliography and the author's identity. On the back cover, there is a brief explanation of the contents of the book and at the same time provokes the interest of potential readers.

Figure 3. Back Cover

Product Validation Test

The development of a supplementary book on the preparation of questions based on Minimum Competency Assessment (*AKM*) for Elementary School teachers was carried out as an effort to answer the need for practical guidance related to the steps for preparing *AKM*-based learning assessment questions at the elementary level. The existence of practical guides

will make it easier for teachers to independently develop *AKM* questions to be used in learning. This step might make students accustomed to working on *AKM* questions. In turn, they could more easily work on *AKM* questions if later selected as samples in *AKM* administration.

Furthermore, the habit of working on *AKM* questions can also support the efforts of schools and the government in increasing students' mastery of literacy, both reading literacy, and numeracy literacy. This cannot be separated from the scope of the *AKM* questions which do include these two literacies. As for other benefits, the presentation of *AKM* questions as an assessment instrument supports contextualization of learning, because the stimuli used in *AKM* questions are based on facts, concepts, and events that surround students.

Inproducing a valid and reliable product, the product development of this research went through the validity test phase by several experts as validators. The validation process used instruments developed by following under product specifications. Due to the situation and conditions of the COVID-19 pandemic, the validation process was carried out independently by sending the instrument to the validator. After the validator finished filling out and signing, the instrument was then scanned and then sent back to the researcher via the WhatsApp application.

There were two categories of validators involved, namely media experts and material experts. Media experts played a role in testing the validity of three aspects, namely identity, appearance, and product specifications. The identity aspect included the inclusion of the developer's identity, the origin of affiliation, instructions for use, to the attractiveness of the editorial title. Based on the results of the validation test, the two media experts involved gave an average score of 4 for this aspect. Thus, it can be concluded that for the identity aspect, this product meets the eligibility criteria.

In the aspect of appearance, the average score obtained from the validator was 4. Thus, it can be concluded that for the aspect of appearance, this product meets the appropriate criteria. Display aspects included product design such as choosing the type and size of the font, color combinations, layout, and page numbering. All of these components must be designed to be effective, efficient, and attractive to the reader. As for the product specification aspect, it included the type of paper used, paper size, and product thickness, to the level of product convenience to carry. In this aspect, the validator also gave a score of 4.

Meanwhile, overall, the validation results show that media experts gave a score above 75. Validator 1 gave an average score of 92, while validator 2 gave an average score of 94. Thus, the overall average obtained from the two validators was 93. Based on Sugiyono's

criteria table, it can be concluded that the validation of the media and material "Supplementary Book of Questions Compilation Based on Minimum Competency Assessment (*AKM*) for Elementary School Teachers" received the predicate "Valid" and "Feasible" to be disseminated.

The next validation was on the aspect of content or material. This stage aims to determine the extent of the completeness of the material listed in the development of a supplementary book for preparing *AKM*-based questions for elementary school teachers. The validator also provided an assessment related to the suitability of the material presented and referred to the analysis of user needs. In this material validation stage, there were two material experts involved. Each has competence in the field of evaluation or assessment.

Three components were validated in this stage, namely the introduction, content, and closing. The introductory part included the availability of an introduction, an explanation of development orientation, developer identity, expected achievements, and a concept map of the material presented. The validation results indicate that the preliminary section got an average score of 4 from the two validators. Thus, it can be concluded that the introductory part of the developed product meets the valid and feasible criteria.

Furthermore, the validators gave an average score of 4 for the content section, indicating that in the aspect of content or material, the product developed in this study meets the valid and feasible criteria. The validation of the content section of this product included several aspects, including the grouping of product content into chapters and sub-chapters, sequential presentation of content, illustrations to make it easier for readers to understand the content, explanations about reading, and numeracy literacies, and availability of examples of *AKM*. The last part to be validated was the cover. This section included the availability of a list of references used and the up-to-date of these references. This section got an average score of 5 from the validators. Thus, it can be said that this section meets the valid and feasible criteria.

Overall, the results of the validation of the content or material of this product indicate that it has met the valid and feasible criteria according to the feasibility table from Sugiyono. The validation results show that the material validators gave a score above 75. Validator 1 gave an average score of 92, while validator 2 gave an average score of 94. Thus, the overall average score obtained from the two validators was 93.

Besides including a scoring sheet, the validation instrument also contained a suggestion sheet for improvement. It aims to solicit constructive suggestions from validators for product improvement. The validation results show that there were several notes of improvement from

the validators. These suggestions include: 1) minimizing typos, 2) paying attention to copyright in the illustrations used, 3) the thickness of the paper type on the cover, 4) increasing the number of examples of *AKM* questions, 5) expanding and deepening the discussion of reading and numeracy literacy materials.

Main Field Try Out

The next stage in the series of product development of this study was the try-out stage for potential users. This stage was carried out after the product was revised following the results of the validation and suggestions from the validators. The main purpose of the try-out is to find out the response of potential users to the product being developed, including the advantages and disadvantages of the product. Thus, the final product developed might have high validity and reliability.

The product try-out in this study was conducted in four different locations, namely SDN 1 Wonokerto Malang Regency, SDN 4 Panggungrejo Malang Regency, SDN 1 Bunulrejo Malang City, and SD Temas 01 Battu City. From each of these schools, two teachers were selected as samples. The requirements for the sample were that the teachers concerned have competence and experience in administering *AKM* in their respective schools. They possessed competencies and experience from participation in training or direct involvement.

The results of field try out indicate that the product developed in this study received a positive response from potential users. This is indicated by the ratings that had been given by potential users, where the product as a whole got a score of 86.66. Based on the results of this assessment, it can be concluded that the product is valid and feasible to be disseminated. However, there were some suggestions for improvement given by potential users to researchers.

First, the book, cover images, as well as color selection are less attractive to readers. Second, it is necessary to add more examples of *AKM* questions. Third, the sample questions should not only be taken from *Pusmenjar* since it is necessary to have additional questions developed by the researchers themselves. Fourth, the source of pictures or questions taken from the internet, as well as any pages that are not the result of self-development should be listed. Fifth, it is not necessary to screenshots of the questions to make them look original and have similar writing. Sixth, the sources for the images presented in the book should be listed. Seventh, digital literacy materials need to be added to facilitate teachers who are not yet qualified to learn well, for the existing one is too monotonous, formal, and rigid. Therefore, some people might be lazy to read it. Eighth, variations in writing and font colors can make people interested in reading them.

Referring to the suggestions of the try-out subjects, it is still necessary to make gradual improvements to the products developed. In general, teachers as implementers in schools need more examples of *AKM* questions. Examples of *AKM* questions that are easy to learn and access are expected to help teachers at schools easily prepare *AKM* questions independently.

Teacher Barriers to Implementation of AKM in Elementary Schools

AKM is the implementation of the Independent Learning policy launched by the Ministry of Education and Culture. AKM replaces the National Examination (UN) which has been implemented since 2003. Some of the government's considerations in replacing the National Examination with an assessment are; First, the UN material is too dense. This causes students and teachers to only test content mastery, not subject competence. Second, the function of the UN is distorted. The National Examination is not only used as a tool for mapping the quality of national education, but has turned into an indicator of student success as individuals. Third, the UN only assesses the cognitive aspect. While the affective and psychomotor aspects have not been touched (Alawiyah, 2015; Tohir, 2019).

AKM serves as a tool to make improvements and improve the quality of the learning system (Pusat Asesmen dan Pembelajaran, 2020). The main objectives of the assessment relate to continuous improvement of teaching in two important ways: a) providing the necessary data for teacher accountability purposes; and b) as "an integral component of the teaching process" (Vonderwell & Boboc, 2013). The AKM result report can be used by teachers as material for evaluating the implementation of learning and as a reference for improving the effectiveness and quality of learning based on the level of student competence. Thus "teaching at the right level" can be applied properly (Pusat Asesmen dan Pembelajaran, 2020). Current learning aims so that students can think critically, analyze, synthesize, and be creative, because only being armed with knowledge is no longer enough (Demir, 2018).

The implementation of AKM has received various responses from various groups. One of the responses came from the teacher who stated that they did not understand the concept and technical implementation of AKM. Meanwhile, students feel they are not ready to face the implementation of AKM (Novita et al., 2021; Rokhim et al., 2021). There is also an assumption that AKM is the responsibility of fifth-grade teachers, mathematics and Indonesian teachers, and providers of AKM tests are entirely the responsibility of the government (Purwati et al., 2021).

These barriers were also found at the research site. The teacher's misunderstanding is not on the conceptual and technical aspects of the implementation of the AKM, but on the aspects of the tests used in the AKM. Based on the product improvement recommendation

data provided by the trial subjects, teachers still have difficulty in understanding and independently constructing AKM tests. Meanwhile, the training held by the government still revolves around the technical implementation of AKM. Teachers look for their references to improve their understanding of how to construct AKM tests, such as by attending seminars or workshops. The competence to develop AKM tests independently is needed by teachers so that students are accustomed to working on AKM tests. The use of formative assessment exercises, such as AKM, is intended to create awareness of their weaknesses to formulate plans to address them (Palmer & Devitt, 2014).

In addition, the lack of mastery of digital literacy is another barrier to implementing AKM in elementary schools. According to the principal who became the location of this research, several teachers complained that they had difficulty operating online assessments. According to Jonas and Hafner, digital literacy is the practice of communicating, relating, thinking, and 'becoming' related to digital media. Mastery of digital literacy is important for the high development of digital media, but it is not matched by the human ability to compensate (Kurnia & Astuti, 2017). According to Paul Gilster, there are four core digital literacy competencies; Internet search, hypertext navigation, knowledge assembly, and content evaluation (Bawden, 2008). As for teachers, mastery of digital literacy is important because the students they teach in class are a technology native generation who from birth has been accustomed to interacting with technology. Teachers in schools with digital technology infrastructure have better performance in implementing digital-based learning compared to schools without infrastructure (Jannah et al., 2020).

The next barrier relates to the quality and availability of facilities and infrastructure that support the implementation of AKM. The teachers who were the test subjects of prospective users in this study said that the poor quality of the internet network and the limited number of laptops or computers were serious obstacles for them. Due to the poor quality of the internet network, schools must apply for a change in the mode of implementing AKM from being fully online to semi online to the local Education Office. This submission process takes time and breaks the teacher's concentration in preparing students. These various barriers become material for evaluating the implementation of AKM policies for the government, so that the implementation of AKM in the coming years can run better. Meanwhile, for schools, systematic and measurable policies and programs are needed to support students' readiness to face AKM (Iman et al., 2021). Online assessments, such as AKM, when used effectively, can be useful in the assessment of twenty-first century learning (Boitshwarelo et al., 2017).

CONCLUSION

Based on the description of the results of research and development, it can be concluded that the product that has been developed provides benefits for teachers. The supplementary book for preparing *AKM*-based questions is a product that can provide information about technical steps for teachers in developing learning evaluation models. Based on the results of the validation and try-outs that had been carried out, the supplementary book can be said to be valid and feasible to be distributed. However, the developer also still needs to make some improvements following the suggestions obtained from validators and potential users. The results also show several obstacles to the implementation of AKM in elementary schools, namely the lack of teacher understanding of the questions and how to develop them, weak digital literacy, poor quality of internet networks, and the lack of availability of laptops or computers.

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