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# Integrated Science Interactive E-Book Local Potential of Kulon Progo: An Overview of Teacher and Student Needs

Yanarti[1*], Jumadi[1], Heru Kuswanto[1]

[1] Magister of Science Education, Yogyakarta State University, Yogyakarta, Indonesia.

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Corresponding Author:
Yanarti
yanarti2021@student.uny.ac.id

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**Abstract:** This research aims to analyze the needs of students and teachers for the development of interactive e-books that are integrated with the local potential of Kulon Progo. This research is qualitative research with a case study approach. Data collection uses needs analysis questionnaires, interviews and documentation. A needs analysis questionnaire was given to 156 students of SMPN 1 Nanggulan Kulon Progo. Interviews were conducted with two science teachers at SMPN 1 Nanggulan Kulon Progo. Interview and questionnaire data analysis techniques use qualitative descriptive. The results of this research are 1) aspects of the student learning process tend to be passive with varying student learning motivation; 2) aspects of using interactive learning media have never used interactive e-books for learning; 3) aspects of student characteristics in understanding concepts are still lacking, preferring to use smartphone media and practicums when learning; 4) the aspect of integrating science with the local potential of Kulon Progo has never been used in learning. Based on data analysis, it can be concluded that teachers and students need interactive e-books that are integrated with the local potential of Kulon Progo to support the learning process.

**Keywords:** Interactive e-book; Local potential; Needs analysis science

## Introduction

Learning media that develop according to curriculum development, the characteristics of students and can solve problems are very much needed in this modern era. The innovation and creativity of educators in creating the latest teaching materials is required to adapt existing technology (Sari et al., 2021). The sophistication of technology in this era is a valuable tool for learning media. The contribution of learning media is used as a way for students to learn as well as a way for educators to teach. Printed books that are often used have changed to electronic books due to technological shifts (Hadaya et al., 2018). The Ministry of Education and Culture (Kemendikbud) has published an Electronic School Book (BSE) to increase student interest and motivation. The existence of BSE books since 2008 is expected to help the availability of textbooks more easily and quickly.

Mastery of students in understanding learning material using e-books can train critical thinking skills through activities of formulating problems, providing ideas as well as solutions, and being able to evaluate the problems presented (Gaol et al., 2019). Tablets and e-books are one of the right tools for learning and reading so that they are used for academic functions (Sackstein et al., 2015).

Interactive e-books include interactive multimedia that combines sound, video, images, graphics, animation, tables and text arranged with the characteristics of an e-book. E-books can be made based on information technology where the content will be made more interesting and interactive (Herianto & Wilujeng, 2020). Learning is expected to be student-centered by using interactive e-books so that students are expected to be able to understand the content of learning material (Firdausy & Prasetyo, 2020).

Research from Asrowi et al. (2019) mentioned that interactive e-books can be an alternative solution to printed textbooks with a limited number. In accordance with his research, the interactive e-book experimental group obtained better data than the control class which

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only used printed books. Hikmaturrosyidah's research (2022) provides data that the development of interactive e-books based on multiple intelligences on ecosystem material can be used to train critical thinking skills. Research from Yuberti et al. (2022) said that interactive e-book content can develop attitudes, determination and depth of material because students get individual learning experiences. Research from Suyatna et al. (2019) states that interactive e-books compiled using a scientific approach are effective as sources of independent learning and build HOTS student capacity.

Interactive electronic books are the best alternative that can contribute to increasing reading comprehension and interest in reading. Electronic books can be combined with innovative learning models which are seen as capable of improving learning outcomes (Susanti et al., 2021). E-books allow more student study time, where students can study the material being studied not only during these lesson hours. The presence of e-books is the right solution to be used as teaching materials that support online and offline teaching and learning activities because e-books are very flexible so that students can read e-books without being limited by time and place (Aristyasari et al., 2023).

Indonesia is a country with geological uniqueness which causes it to have a wealth of biodiversity. Integration of the local potential of the region in science subjects in schools is very necessary because the younger generation experiences degradation of local potential and culture (Wilujeng et al., 2017). The effectiveness of local potential integration in science learning is very important to enable students to play an active role in learning by observing objects directly. This is intended to train science process skills in increasing students' understanding of concepts (Wilujeng & Suryadarma, 2018).

Kulon Progo Regency is one of the regencies in the Special Region of Yogyakarta which has various potentials and local wisdom. Its topography consists of lowlands to hills with a maximum height of 859 meters. These hills are known as the Menoreh Hills. Some of the potential of the Kulon Progo region consists of geotourism of caves, split/dimensional stones, gold and barite minerals (Suwarno, 2017). Apart from that, there are beaches along the southern coast of Kulon Progo which offer a stretch of mangrove forest and other beach tourism. Batik geblek jointly, culinary food and several traditions such as nglarak blarak are also potential for Kulon Progo.

Interactive e book integrated with local potencial can be teaching material. Teaching materials based on local wisdom make it easier for students to understand, communicate, and solve problems with the information obtained. Learning will be meaningful by applying local wisdom-based learning (Aristyasari et al., 2023). Learning using interesting media such as interactive e-books, of course provides new experiences for students, apart from providing other meanings. Meaningful learning can occur if students are able to connect new knowledge from the surrounding environment with the knowledge gained at school (Puspitasari et al., 2021).

This study aims to review the needs of teachers and students for an interactive science e-book integrated with the local potential of Kulon Progo. Some of the aspects analyzed from teachers and students include the teaching and learning process in schools, the characteristics of students, the integration of learning with local potential, the need for learning media. The analysis is divided into problems, contexts and needs for an interactive science e-book integrated with the local potential of Kulon Progo.

## Method

This research is qualitative research with a case study approach with observation to investigate certain conditions so as to explain how an event occurs (Hodgetts & Stolte, 2012). Qualitative research is an approach to explore and understand the meaning of individuals and groups to problems that exist in the social environment. The aim of the research is to find out the needs of teachers and students in an interactive e-book on science integrated with local potential. The sampling technique with the technique (Nuranggraeni et al., 2020) states that in qualitative research there are no random samples.

Two science teachers at SMP Negeri 1 Nanggulan who have been teaching for a maximum of 26 years. Meanwhile, out of a total of 192 class VII students, 156 students were selected to analyze the data.

Data collection techniques used are observation, interviews and questionnaires. Observations were made to see directly teaching and learning activities. Interviews were conducted to explore the problems that occurred. The guidelines and interview instruments in this study are based on field-based investigation which includes three main research focuses, namely: problems, context, and needs (McKenney & Reeves, 2014). Questionnaires are made via Google form to detect problems that occur. The questionnaire given to students was in the form of open and closed questions with yes and no answers.

Milles and Hubberman's analysis technique are the choice for conducting data analysis. The stages used in the data analysis process are: reducing data, showing data, making conclusions and verifying (Miles & Huberman, 1994). The technique begins with analyzing the results of the interviews, followed by the results of

the observations, which are then explained with an explanation. This information will also be matched with the results of documentation observations in the field. Inappropriate information is not written in the elaboration so that the focus of the elaboration is related to research.

## Result and Discussion

The results of the analysis of the needs of teachers and students in the integrated natural science interactive e-book of Kulon Progo's local potential will be divided into two data, the first data is a review of teacher needs, while the second review is the needs of students. The results of the analysis of teacher needs data are divided into four aspects, namely the process of teaching and learning activities, the use of interactive learning media teaching materials, the characteristics of students and the integration of the local potential of Kulon Progo. Interactive e-book in Piayu Laut-integrated natural science contextual teaching & learning can use during educational covid-19 distruption to recovery. Interactive e-book's content can assist teacher to improve student's motivation, deeply of learning matter, and their attitude. Interactive e-book Piayu Laut-integrated bring student meaningful learning experience. The students can study by themself and improve students's competences (Suwarno et al., 2021). The results of interviews with two teachers on aspects of teaching and learning activities can be seen in table 1.

**Table 1.** Results of Interviews with Teachers on Aspects of the Process of Teaching and Learning Activities

| Indicator | First Teacher | Second Teacher |
|---|---|---|
| What were the obstacles while you were teaching? | Students are passive and tend to be silent | Heterogeneous students with different backgrounds, less active students |
| In your opinion, is motivation in the learning process important? What is the reason? | It is important to know the learning interests of students | It is very important because with good motivation, steps will be better, results will be better |
| How is the learning motivation of students during learning? | The motivation to learn is different, some are enthusiastic, some are mediocre | Some are good, some are lacking, each class has different motivations different |
| On what material are students motivated? Why are students motivated on the material? | The nature of science and the scientific method. Because new things have never been obtained when Elementary School. | Materials that don't think much, because they are happy and don't feel burdened. |
| What materials are considered difficult by students? Why this material is considered difficult? | Temperature, Heat, Expansion due to many calculations and novelties | The material needs thinking/calculation because from the start the material was considered difficult |
| What are the student learning outcomes for this difficult material? | Many students do not complete | Some are good, some are enough |
| What do you do to overcome students' learning difficulties with this difficult material? | With lots of practice questions and discussion | With individual or group guidance as limited as the time available |
| Do you carry out practicum activities? With what media is the practicum carried out? | Yes. Depending on the material, many uses real media in the laboratory | Yes. Existing equipment in the laboratory and environment |

Teacher interviews on aspects of teaching and learning activities found several problems. Constraints of students who tend to be passive and silent and the heterogeneity of their backgrounds are obstacles for teachers in teaching. This can be anticipated by using interactive e-books, according to Kwartolo (2010) and Lestari et al. (2016) theoretically learning media in the form of e-books can make students more active by presenting learning processes and learning that is interesting and has deep meaning.

The learning motivation of students also varies. Material that is considered difficult is material that has a lot of thoughts or calculations using formulas. The difficulty of the material resulted in many students getting incomplete grades or below the set standards. The solution from the teacher in training the difficult material is limited to giving explanations and practicing questions. This can be overcome by using interactive e-book media according to research (Wilujeng et al., 2017), an interactive e-book made with science contextual learning on local wisdom helps teachers improve attitudes, motivation, and understanding of learning material by students. In addition to providing students with a meaningful learning experience even through self-study. In addition to understanding concepts, the use of interactive e-books can improve students' scientific literacy (Yuberti et al., 2022).

Aspects of the use of interactive learning media obtained several problems on table 2. The dominant learning resources used by teachers are still in the form of textbooks and worksheets provided by the agency. The teaching materials have been packaged attractively,

but students' motivation towards the material is still lacking. Mobile phones, videos, power points, laboratories, photos have been used for learning media, but teachers have not used interactive learning media such as interactive e-books. Even though interactive e-books can be used as learning resources (Oktafiani et al., 2022). The advantages offered by interactive e-books compared to printed textbooks include being accessible online, making it easier to search, more affordable costs, and portability (Jamali et al., 2009; Sackstein et al., 2015). The use of interactive e-books by presenting material in the form of images, appropriate illustrations, and interactive features will attract students' interest in learning (Asi et al., 2021).

**Table 2.** Results of Interviews with Teachers Aspects of Using Teaching Materials and Interactive Learning Media (Interactive E-Books)

| Indicator | First Teacher | Second Teacher |
|---|---|---|
| What teaching materials do you use in learning science? | Teacher book, student book | Science package book (library managed), LKS, other references |
| Have the concepts presented in the teaching materials helped students to Achieve the learning objectives? | Yes, but there are some materials/concepts that are not in the book | Some have been able to catch, some are still finding it difficult |
| Are the teaching materials packaged in an attractive, easy-to-understand manner, and equipped with helpful and relevant illustrations? | Interesting, easy to understand | It's good enough, but for students who don't have motivation, the results are still not good |
| What learning media do you use during the lesson? | Smartphones, Videos, Books, LKS | smartphone, Power Point, Whiteboard, Video, Laboratory, Photo, Reality |
| Is the lack of availability of good learning media the cause of students' lack of understanding of learning material? | No, other factors such as interest are also very influential | There is a possibility yes |
| What media is most influential in learning? | Smartphones, Books | Those related to trying/practicing, and those related to IT (smartphones) |
| Have you used interactive learning media in learning? Is interactive learning media important in the learning process? | Not all the material, just some material. It is important because children immediately know concrete results and the material is easy to understand | Not yet. It is important because the child will be happy and motivated |
| Will the use of interactive learning media make learning more fun (not boring)? | Yes | Maybe yes |

Asi et al. (2022), in his research, teacher response between the presentation of material, illustrations, interactive features, and content conformity with KI and KD. The language that is easy to understand and the feasibility of using interactive ebooks in learning. Tsvyatkova et al. (2019) stated that interactive e-books are easily accessible media for self-study and learning together. On average, the teacher's response to interactive ebooks is in very good criteria so that interactive ebooks become media that can be used in science learning.

According to the interview, the lack of availability of good learning media the cause of students' lack of understanding of learning material are interest and can increace the student's motivation. (Ummah & Rifai, 2021), The design and creation of science edupark e-book has been adjusted to the rules of scientific steps on the used in The National Geopark of Ranah Minang Silokek tourism object. Learning that is carried out will be more effective in its time, and can attract the attention of students in learning. One of the things that attracts the attention of students to science edupark e-book is about the display which is equipped with images, videos and material that is explained using scientific approach steps which include observing, asking, trying, reasoning, and communicating those related directly with tourist destinations in The National Geopark of Ranah Minang Silokek, which raises the enthusiasm of students to learn on their own. Given that teaching materials are equipped with a voice that provides instructions or directions in the steps of a scientific approach, students can independently engage in learning.

Based on the research of Riyanto et al. (2023), it can be elucidated that 50% of teachers utilize thematic books published by the government, 30% employ private publications, 7% fabricate self-generated materials, and 13% use a combination. While teachers have dutifully fulfilled their roles, there remains a paucity of utilizing computers, LCDs, smartphones, and multimedia during instructional sessions. Most teachers (78%) exhibit proficiency in navigating interactive e-books. However, there is room for enhancement in leveraging technology for pedagogical purposes, which could significantly enrich students' learning experiences. It can be that interactive e-book can be future of education on learning media.

**Table 3.** Results of Interviews with Teachers on Student Characteristics Aspects

| Indicator | First Teacher | Second Teacher |
|---|---|---|
| In your opinion, how do students understand the concepts in understanding learning? | Not all understand that learning does not have to be in the classroom | Some are good, some are not good, the environment can be a source of learning |
| In your opinion, are students' understanding of the concept different or the same? Why could it be different | Different because of the level of ability, intelligence is different | Different, students' backgrounds are different |
| In your opinion, how do students learn independently? | Students are not yet independent in learning, there must be guidance | Independence less need guidance |
| Will interactive learning media help students understand concepts and increase independence? | Yes, but there must still be supervision from the teacher because it could be that later students can open things that have nothing to do with the subject matter | It is possible, because it will definitely be packaged in such a way as to make it attractive |

The characteristics of students in learning science on table 3, have good understanding and some don't. Students do not understand that learning does not have to be in the classroom, but can be done outside the classroom. Conceptual understanding of the material varies depending on the level of intelligence and background of the students. The use of interactive e-books in interactive e-books with media collaboration both visual and audio can make learning centered on students, so that students can understand the content of the material better and more contextually (Tressyalina et al., 2021). Research conducted by Agustin et al. (2019) the use of interactive science interactive e-books can increase scientific literacy in terms of scientific context by 34.0%, the dimensions of scientific knowledge by 41.6% and the dimensions of scientific competence by 35.9%.

The independence of students is still lacking so guidance is still needed. The existence of interactive e-book learning media will likely be able to increase students' understanding of concepts and independence. However, this needs supervision from the teacher because students can open up other things outside the subject matter. Development of e-book media carried out by Khairinal et al. (2021) able to increase the independence of learning and the interest of students. Independence itself is a cumulative attitude during the development of individual learning to continue to learn independently to deal with environmental situations that enable individuals to think and act independently.

**Table 4.** Results of Interviews with Teachers of Integration Aspects of Local Potential of Kulon Progo

| Indicator | First Teacher | Second Teacher |
|---|---|---|
| Have you ever used an interactive science learning media integrated with the local potential of Kulon Progo? | Not yet | Not yet |
| Do you agree with developing interactive learning media integrated with the local potential of Kulon Progo? | Agree | Agree |
| According to you, what local potentials of Kulon Progo are suitable to be developed for interactive science learning media? | Tourism villages, for example, about culinary or about handicrafts | Beaches, mountains |
| What are your suggestions and input for the development of interactive science learning media integrated with the local potential of Kulon Progo? | Local potential such as culinary and handicrafts can be developed | The development of interactive learning media integrated with the local potential of Kulon Progo is linked to the Learning Objectives and Learning Objective Flow |
| Is it necessary to develop interactive learning media integrated with local potential in science learning? | Yes | Needed, so that learning outcomes are better |

In the aspect of integrating natural science material with the local potential of Kulon Progo on table 4, it was found that there is no interactive learning media for science that integrates with the local potential of Kulon Progo. Educators agree that local potential is included in learning integration so that learning is better adapted to the flow of learning objectives and learning objectives in the independent curriculum used. Some of the local potentials that are expected to exist in the integration of materials, namely tourist villages, culinary specialties, beaches, mountains and handicrafts in Kulon Progo. Research conducted by Suwarno et al. (2020) states that interactive e-books with contextual learning of local wisdom are able to provide meaningful learning as an

alternative to developing student competencies. This is in line with research (Wilujeng & Suryadarma, 2018), that the use of integrated local potential with integrated natural science can improve process skills and natural science concepts in the learning process. Study from Wilujeng et al. (2017), learning with local potential is considered effective for measuring students' scientific attitudes as well as aspects of students' natural science skills such as process skills, generic and students' critical thinking. Based on research, the use of interactive multimedia e-books in learning can improve student learning outcomes, interests, and motivation. The development of interactive multimedia e-books is also expected to increase students' curiosity (Herianto & Wilujeng, 2020).

As a result of research Nisa et al. (2020), students have better understanding and are able to draw conclusions of the learning problems. The effectiveness of the science book integrated with the bakpia local potentials is in the "high" category. The results of the Test of between Subject Effect from the Manova test also show the science book can simultaneously improve students' critical thinking and communication skills.

**Table 5.** Results of Questionnaires and Interviews with Students

| Indicator | Answer Results |
|---|---|
| Use of learning resources (teaching materials and learning media) | |
| What teaching materials are used in learning? | Package books, worksheets, internet, videos, cellphones, laboratory equipment |
| What teacher's method did Ananda like? (More than one answer) | 46.2% use a smartphone<br>45.5% practicum<br>35.9% lecture<br>6.4% liked the discussion/presentation<br>Another 14.1%. |
| What method is most often used by teachers? | 80.77% of students answered that they often used the lecture method (listening to the teacher's explanation), the remaining 19.23% had used practicum methods, discussions and used smartphones |
| Learning process | |
| Based on Ananda's experience, what material is considered difficult? Why is it difficult? | Science material that requires calculation, because it is difficult to understand, there is a formula, the solution is difficult |
| How does the teacher convey the difficult material? | Explain again, give practice questions, listen again to the teacher's explanation |
| Was Ananda assisted with learning media in this difficult material? What kind of learning media? | Yes, in the form of LKS |
| Does Ananda enjoy using a variety of learning media? | Yes |
| Smartphone ownership | 98.1% own a smartphone<br>Used for 28.8% studying at home, 24.4% others, 23.1% learning at school, 12.2% social media, 11.5% games |
| Wifi availability | Available |
| The need for interactive learning media | |
| Do teachers use interactive learning media in learning? | Yes |
| How often do teachers use interactive learning media? | 73.1% answered sometimes |
| Integration of local potential of Kulon Progo in learning | |
| Do you know what local potential exists in Kulon Progo? Try to mention! | Menoreh Hill, YIA airport, Sermo Reservoir, Suroloyo Peak, Culinary Tourism, limestone, clay stone, gebleg jointly, nature tourism |
| Do you agree with developing interactive learning media integrated with the local potential of Kulon Progo? | 76.9% answered yes<br>21.8% answered no |

At the table 5, the difficulty of learning material for students is in line with the difficulty of the material presented by the teacher, namely material that requires a lot of thinking or calculations using formulas. The method used by the dominant teacher uses lectures or explains directly. Students prefer to learn using smartphones as much as 46.2% and practicum methods as much as 45.5%.

Interviews with students found that 98.1% had a smartphone. The smartphone is dominantly used for studying at home by 28.8%, and learning at school by 23.1%. This is in line with research (Cambridge Assesment International Education, 2018) that as many

as 67% of Indonesian students use smartphones in teaching and learning activities in class, even 81% more often use them to do homework they get from school. The use of interactive learning media to get answers is sometimes used so that its use is said to be not optimal.

The developing of interactive e-book with its features consisting of multimedia content such as audio, video, animation, and simple problem-solving activities has been effective in enhancing the mastery of student concepts (Harjono et al., 2020).

The development of interactive e-books by utilizing technology is urgently needed. The media can provide space for students to use technology in learning. Teacher creativity in developing learning will be trained to use learning media in class (Hadaya et al., 2018). Study Wahyuningtyas et al. (2020), an interactive e-book (electronic book) based on Lectora Inspiration by strengthening the character of curiosity about the rich sub-energy wealth in Indonesia. This is in line with research (Ramadhani & Khusniati, 2022), Interactive E-Books with digital applications have the characteristics of fun learning, increased learning motivation, active and contextual learning which contains menus of information, apperception, materials, virtual labs, games, quizzes and instructions.

## Conclusion

Based on the research results, it can be concluded that it is necessary to develop interactive science books that integrate the local potential of Kulon Progo. This is based on the context of assessing teacher and student needs for interactive science e-book learning media in terms of conceptual understanding, interest, motivation and student activities. The development of interactive e-books will bring student learning closer to real life contexts. Apart from that, if used in learning, it will provide space for students to utilize information technology in the era of digitalization. Therefore, the need to develop interactive science e-books that are integrated with local potential is needed to improve students' various skills.

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