Article

Development of Ethnoscience-Based Digital Teaching Materials in Authentic Jember Patrol Music in Sound Sub Materials for Students in Junior High School

Rafiatul Hasanah¹, Winda Dwi Kusumawati²*

¹,²Universitas Islam Negeri Kiai Haji Achmad Siddiq Jember, Indonesia

*Corresponding Address: windadwikusuma@gmail.com

Article Info

ABSTRACT

Culture is the wealth of the Indonesian nation while education is an intermediary for forming the character of the nation's successor. Learning in schools is an interaction that helps students understand learning materials, especially conceptual and factual learning. One of them is in learning Natural Sciences (IPA), in the field of Physics. Noise material is a conceptual material with a discussion of sound waves produced by vibrating objects (sound sources). Based on the needs analysis obtained, the development of appropriate teaching materials to explain the material is a digital book. The purpose of this study is to describe the level of validation of teaching materials and describe student responses to ethnoscience-based digital teaching materials in Authentic Jember Patrol music on sound sub-materials in class VIII SMP/MTs students. The type of research used is the development of a 4-D model. The subject of validity in this study involved material experts and media experts and science teachers, with the results of material validation being 91.03%, media experts 89.41%, and user experts (teachers) 88.23% very valid categories. While the student response test in this study was divided into 2, namely, small-scale test and large-scale test with an average percentage result of 80.76% with a valid category, and large-scale trials obtained an average percentage of 87.28% with a category very, without any revisions to the developed teaching material products.

Keywords:
Digital teaching materials; Sound; Ethnoscience; Patrol music;

INTRODUCTION

Indonesia is a country that is rich in ethnic and national diversity, according to historical records of the social life of the Indonesian people who come from the tribes and cultures of each region (Bagus Brata, 2016). Entering the era of globalization, cultural values in Indonesia are slowly shifting, so that the culture that should be preserved begins to fade and be forgotten (Suketi, 2019). Seeing this condition, education can participate in maintaining and preserving the existing culture through learning in schools. As in UURI number 20 of the year concerning the National Education System Chapter II article 3, it is stated that national education has a function as a developer of student abilities and forms the dignified character of the nation's civilization in educating the nation's life, and developing...
the potential of students. Education seeks to make people who believe and fear God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens (Wahyudin, 2020). In line with this goal, an important component in developing the potential of the nation's successors can be done through the interaction of educators with students (Irfanda, 2018), in more detail, namely learning, we can know in the teaching and learning process (KBM) can not be separated from learning tools that can effectively and efficiently help teachers and students in understanding a material.

The results of the first observations the researchers got information, the science subject teacher class VIII MTsN 2 Jember the KBM process held focused on learning resources recommended by the government, namely the 2017 revised Kemendikbud Science book and UKPM (Independent Learning Activity Unit) and during online learning the two books were distributed separately. digital. The impact is that students only understand concepts without knowing the application of existing material, thus teachers need additional teaching materials to deliver learning materials.

In fact, learning tools are information facilities, tools that are arranged in sequence according to the competence of the subject and are used in the learning process (Putri, 2019). Thus the use of teaching materials in delivering material can help students be more creative, independent and master concepts that have not been understood. Along with the development of technology and information in conveying messages, it is not always in the form of print media, one of which is digital books that can help students or teachers understand material, both conceptual and factual material with unlimited time and place.

According to (Agung, 2020) Natural Sciences (IPA) is a branch of natural science that studies all aspects of natural events and their changes from the branches of chemistry, physics, and biology. One of the branches of science subjects whose learning material is a source of knowledge, concepts and principles can grow scientific skills and help in solving everyday problems. In accordance with educational policy that physics learning material is a source of human activities, so that physics is one of the areas of the ethnoscience approach in science that studies natural phenomena and human interactions within the scope of the surrounding culture (Jeane, 2020).

One of the Indonesian cultures that contains elements of science in the realm of physics is the Jember patrol music art culture. This patrol music art was born from the acculturation of the Madurese and Javanese cultures who settled in Jember district and became the Padhalungan culture. As one of the arts that was born from cultural acculturation, Jember's patrol music still exists today. Thus, ethnoscience can be used in the field of education, especially SMP/MTs in Jember Regency. So that it can create interactive, innovative learning and can be a factor in students' understanding of the material and local culture. Considering that patrol music is currently a trending topic as an Intangible Cultural Heritage (WBTB) in Jember Regency (Jemberkab, 2021).

The form of the use of ethnoscience is found in the physics branch of the sound material for class VIII even semesters, considering that the material is conceptual material and is closely related to life so that in its presentation it requires an intermediate medium (Diana, 2020). However, the facts in the field of sound sub-materials are only concepts and implementations with examples of modern musical instruments and the difficulty that students understand is how to apply formula with surrounding life. This right is undeniable from the KBM process that is held, where teachers do not associate learning materials with the culture around them. In fact, the sound wave material is directly proportional to the art of musil patrol with ethnoscience dressing, where ethnoscience collaborates Jember patrol music with sound wave material which will make it easier for students to understand the
concept of sound. Thus the function of teaching materials in clarifying and facilitating sound wave material in local culture.

Based on a needs analysis questionnaire for class VIII MTs Negeri 2 Jember, as many as 18 students who are representatives of class VIII E and VIII H on the Jember patrol music culture. From the questionnaire, a vulnerable score of 16.7% was obtained from 18 students who did not know the art of patrol music. And 38.9% of 18 students do not know if there is an element of physics in patrol music and the average score range is obtained in the importance of supporting books or supplements. Students answer "very important" is

METHODS

The type of research used is Research and Development (R and D) which is a research method in developing and testing the feasibility of a product. The development and research model this time was developed by Thiagarajan, which is 4-D with stages

(Sugiyono, 2019). In this study, the research used a 4-D model which was modified into 3-D; Define, Design, and Development because of the time the author faced.

The Feasibility Test of Ethnoscience-based teaching materials consists of the feasibility of the material, the media and the feasibility of the presentation. The validity of the teaching material product or not is determined by the lecturers, science teachers and students. Following are the stages in this research:

1. Define
   Researchers define and determine product development to be made. This stage consists of:
   a. Front-end Analysis: stage of problem analysis needed in product development
   b. Learner Analysis: researchers conduct a needs analysis to determine research subjects that can be used in developing products.
   c. Task Analysis: The researcher determines the task analysis that is in accordance with the existing problems
   d. Concept Analysis: The researcher prepares the concept of the material that will be presented in the teaching materials and in accordance with the Core Competencies (KI) and Core Competencies (KI)
   e. Specifying Instructional Objectives: researchers develop teaching materials to be made, it is necessary to formulate learning objectives.

2. Design
   At this stage the researcher determines the format of product development to be made. Here are the steps in the design stage
   a. Material Preparation: the material used in this study is a branch of physics in the sound sub-material.
   b. Product Selection: according to the needs analysis, the researcher developed a digital book based on Ethnoscience on Jember's parol music
   c. Preliminary Design: The first thing the researcher did was to design the product before testing in the field, either in the form of selecting the format of the teaching materials and the instruments used.
      1) Format selection: the digital book format developed is, 1) cover (logo, title, image, and identity), 2) introduction, 3) table of contents, 4) list of pictures, 5) introduction (description of digital book, KI, KD, indicators and learning objectives, and concept maps), 6) content (sound material and
independent/group assignments), and 7) closing (answer key, glossary, bibliography, and author's biodata).

2) Instrument Selection
The design of the instrument aims to determine the validity of the product both before and after being tested. In this study, the researcher used an instrument that was in accordance with the product being developed.

3. Development
At this stage the researcher made product improvements by revising the product which was judged to be valid or not by a team of lecturer material experts, media experts from lecturers, and user experts (teachers). Products that have been validated by a team of experts are ready to be tested, product trials are tested on class VIIIF and VIIIH students at MTs Negeri 2 Jember. With small-scale and large-scale trial subjects. The small-scale trial was carried out by 6 students consisting of 3 students of class VIIIF and 3 students of class VIIIH. Meanwhile, for the large-scale test, there were 30 students consisting of 15 students from class VIIIf and 15 students from class VIIIH.

4. Disseminate
At this stage the researcher did not develop a method due to the limited time. Moreover, the research conducted was not to determine the level of effectiveness of learning activities, but to determine the validity and student responses to ethnoscience-based digital books in authentic Jembe patrol music.

The types of data in this study are quantitative and qualitative data obtained from a team of experts (science lecturers and teachers) and test student responses in the field. Meanwhile, the research instrument used in the form of a questionnaire to test the validation of the product that has been made. The questionnaire used is in the form of a checklist with a score range using a Likert scale, where each item has a gradation from positive to negative. (Sugiono, 2019). The following is the rating scale used by researchers:

| No | Criteria         | Score |
|----|------------------|-------|
| 1  | Very Good        | 5     |
| 2  | Good             | 4     |
| 3  | Enough           | 3     |
| 4  | Not Enough       | 2     |
| 5  | Very Less        | 1     |

(Sezy, 2021)

In collecting data, whether the product is valid or not valid, the researcher uses the following technical data analysis techniques:

$$v_{ah} = \frac{Tse}{Tsh} \times 100\%$$

Information:
- $V_{ah}$: Percentage Value
- $T_{se}$: Total score Empirical (Maximum expected score)
- $T_{sh}$: Total expected score

With the criteria for the validity of the product presented by the researcher as follows:

| Validity Criteria | Validity Level                |
|-------------------|-------------------------------|
| 85.01%-100%       | Very valid or can be used without revision |
| 70.01%-85.00%     | Valid or can be used but need a small revision |
| 50.01%-70.00%     | Not valid, it is recommended not to use it because it needs a major revision |
| 01.00%-50.00%     | Invalid, or should not be used |
While the results of the analysis of the student response test, the level of product attractiveness will be seen as follows:

\[ \nu_{ah} = \frac{T_{se}}{T_{sh}} \times 100\% \]

Information:
- \( V_{ah} \): Percentage Value
- \( T_{se} \): Total Empirical score obtained from student responses
- \( T_{sh} \): Total expected score

With the product attractiveness criteria presented by the researcher as follows:

| No | Percentage (%) | Criteria            |
|----|----------------|---------------------|
| 1  | 81%-100%       | Very Interesting    |
| 2  | 61%-80%        | Interesting         |
| 3  | 41%-60%        | Quite Interesting   |
| 4  | 20%-40%        | Not Attractive      |
| 5  | 0%-20%         | Very Unattractive   |

(Sahlan, 2016)

RESULTS AND DISCUSSION

The results of research and development were in the form of data description, data analysis, and data interpretation using relevant theories. The purpose of developing this product will be to increase knowledge and help the student learning process. The model that the researcher uses adopts the 4-D model (Define, Design, Develop, and Disseminate) developed by Thiagarajan. However, this time the researchers only arrived at the Develop stage due to cost and time constraints, and only limited to the limits made for Ethnoscience-based digital teaching materials and student responses to the product. The following are the stages in the preparation and manufacture of ethnoscience-based digital teaching material products:

1. Define Stage
   At this stage the researcher obtains the results of the needs analysis related to the product to be developed as follows:
   a) Products developed must be in accordance with the K2013 curriculum and in accordance with KI and KD
   b) The material that is in accordance with the research product is a branch of physics in the sub-material of sound
   c) The purpose of the developed product can help students understand the formulas and concepts of the material
   d) Students can get to know traditional music culture through learning
   e) Intermediary media that can be used are in the form of electronic book applications, more precisely flipbooks

2. Design
   At this stage the researcher determines the format and design of the product development with the following steps:
   a. Preparation of learning materials
      The product must be in accordance with the curriculum, Core Competencies, Basic Competencies, Objectives and Indicators.
   b. Media Selection
      In making media, researchers used software, namely Microsoft Word 2010, Canva, CorelDraw and Flipbook.
Microsoft word can be used in the form of data processing (Setyawan, 2018). However, researchers used Microsoft Word 2010 to compile material or content on learning products and the size of the previous digital book was adjusted to support books in learning, which was 21 x 29.7 cm (Prastowo, 2016). The format for writing and product design is written using Arial and Times New Roman font size 12 pt. Meanwhile, on the cover the researcher uses CorelDraw and on the additional design of the book content using Canva media. FlipBook itself is used in the final stages of all products that have been designed by researchers.

c. Media Drafting
At this stage the researcher conducts product design starting from compiling:
1. Cover which contains; Logo, Title, Image and Identity of the researcher
2. Foreword
3. Table of Contents
4. List of Figures
5. List of Tables
6. Introduction which contains; Book description, Core Competence and Basic Competence, Indicators and Learning Objectives, User manual, Ethnoscience description and Concept maps
7. Split page
8. Content which includes; Theory, Materials and ethnoscience, independent task, and Competence test
9. Final which content; Answer key, Glossary, Bibliography, Biography and cover

The following initial design for the development of Ethnoscience-based digital teaching materials can be seen in the table below:

| Cover | Foreword |
|-------|----------|
| ![Cover Image](image1.png) | ![Foreword Image](image2.png) |

Table 4. Product Design

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INSECTA Volume 3 Number 1, 2022
p-ISSN 2722-8509 | e-ISSN 2722-8495
Tabel Contents

| Page | Title |
|------|-------|
| 1.15 | Cover Detai |
| 1.16 | Kew Pengantar |
| 1.18 | Daftar Isi |
| 1.20 | Daftar Tabel |
| 1.22 | Daftar Ilustrasi |
| 1.24 | Daftar Pustaka |
| 1.26 | Daftar Pustaka |

List of figures

1.1 Cerita penangkapan Mok Piang |
1.2 Tekaan Alexander Graham Bell |
1.3 Cerita dan esok perlahan telah dirasakan |
1.3 Tim Picio |
1.4 Tekaan Tukang Asetulita |
1.5 Cerita dan esok perlahan telah disuluh |
1.6 Cerita dan esok perlahan telah dibangun |
1.7 Cerita dan esok perlahan telah dibangun |
1.8 Cerita dan esok perlahan telah dibangun |
1.9 Cerita dan esok perlahan telah dibangun |
1.10 Cerita dan esok perlahan telah dibangun |
1.11 Cerita dan esok perlahan telah dibangun |
1.12 Cerita dan esok perlahan telah dibangun |
1.13 Cerita dan esok perlahan telah dibangun |
1.14 Cerita dan esok perlahan telah dibangun |
1.15 Cerita dan esok perlahan telah dibangun |

List of tables

1.1 Tabel: Cerita Petualang | Dalam Media |
1.2 Daftar Isi | Materi Sumber |

Book description

Buku ini merupakan buku yang secara khusus dibuat untuk memfasilitasi pembelajaran di kelas. Buku ini dibedakan menjadi beberapa bagian, yaitu: daftar isi, daftar tabel, daftar ilustrasi, daftar pustaka, daftar pustaka, dan daftar pustaka. Buku ini disediakan dalam bentuk elektronik dengan menggunakan teknologi modern untuk membantu pembelajaran dan memfasilitasi pembelajaran di kelas.

KI and KD

Indicators And Learning Objectives
User manual

Ethnoscience Description

Concept Maps

Split Page

Theory

Materials And Ethnoscience
### Independent Task

**A. Tentukan hubungannya dengan pernyataan berikut:**

- 

**B. Jumlahlah jawaban:**

1. Gelerang berusia sembilan tahun dalam konteks kegiatan makanan yang membutuhkan minimum 60 persen dari energi total yang diperoleh oleh tubuhnya.
2. Diketahui: $v = 60\text{ cm/s}$, $W = 120\text{ J}$.

C. Penyimpanan energi dalam bentuk sistem fisik atau kimia, khususnya dalam bentuk energi yang dapat digunakan untuk aktivitas fisik atau kognitif, atau dalam bentuk energi yang dapat digunakan untuk proses biologis atau fisik.

### Competence Test

**A. Pilihlah jawaban yang paling sesuai:**

- Olimpiade yang diadakan untuk mencakup disiplin disiplin geologi.
- Olimpiade ilmiah.
- Olimpiade olahraga.
- Olimpiade seni.
- Olimpiade lainnya.

**B. Jawaban lainnya:**

1. Kimia.
2. Biologi.
3. Fisika.
4. Matematika.
5. Bahasa Inggris.

### Answer Key

**A. Jawaban pilihan ganda:**

1. C
2. D
3. B
4. B
5. C

**B. Jawaban notasi:**

1. Gelerang berusia sembilan tahun dalam konteks kegiatan makanan yang membutuhkan minimum 60 persen dari energi total yang diperoleh oleh tubuhnya.
2. Diketahui: $v = 60\text{ cm/s}$, $W = 120\text{ J}$.

C. Penyimpanan energi dalam bentuk sistem fisik atau kimia, khususnya dalam bentuk energi yang dapat digunakan untuk aktivitas fisik atau kognitif, atau dalam bentuk energi yang dapat digunakan untuk proses biologis atau fisik.

### Bibliography

**BARTUH PUSTAKA**

Anggaran, Pilih sama. Buku Bimbaselia Teknik Fisika Cerminan 1st. Jakarta: Budi Pustaka, 2019.

Makalah dan jurnal. Peningkatan Fisika 1. Yogyakarta: UOM Press, 2013.

Riset: Buku Bimbaselia. Isu Isnin: Menteri Pendidikan dan Kebudayaan, 2014.

Sumber: Daftar pustaka. Yogyakarta: UOM Press, 2013.

### Biography

**Winda Dwiti Kusumawati**

Winda Dwiti Kusumawati is an experienced and dedicated educator who has been in the field of education for several years. With a strong passion for teaching, she has a proven track record of success in creating engaging and effective learning environments. Her dedication to her students and commitment to excellence has earned her the respect and admiration of her peers and colleagues. With her expertise in the field, she continues to inspire and guide students towards achieving their full potential. 

**Winda Dwiti Kusumawati**

INSECTA Volume 3 Number 1, 2022
p-ISSN 2722-8509 | e-ISSN 2722-8495
3. The development stage here contains the refinement of teaching material products that have gone through the revision stage. Furthermore, the product is validated by meteorologists, media experts and user experts (teachers).

a. Expert validation

- Material expert validation is carried out to test the validity in terms of the material or content contained in the teaching materials made. There are three aspects of assessment in the questionnaire including; appropriateness of content, presentation and language used. The percentage results in the material validation test obtained a range of values of 91.03% with details;

| Table 5. Validation Material |
|-----------------------------|
| No | Scoring Aspects     | Score |
|----|---------------------|-------|
| 1  | Content Eligibility | 54    |
| 2  | presentation        | 38    |
| 3  | Language            | 40    |
|    | Quantity            | 132   |
|    | Percentage (%)      | 91.03%|

- Media expert validation is carried out by testing the validity of teaching materials made from graphics, with two aspects of assessment including; the feasibility of the software engineering used and the feasibility of displaying media and audio. At this stage the researcher obtained the results of the validation test of the range of values of 89.41% with details;

| Table 6. Validation Material |
|-----------------------------|
| No | Scoring Aspects       | Score |
|----|-----------------------|-------|
| 1  | Software engineering | 57    |
| 2  | Visual and audio display | 19  |
|    | Quantity              | 76    |
|    | Percentage (%)        | 89.41%|

b. User Validation (Teacher)

Furthermore, the product that has been validated by a team of experts is revalidated by the user (teacher) before the product is tested and responds to students. Aspects assessed by user validation include product feasibility, material suitability, and aspects of the language used. At this stage the researcher obtained the results of the validation test of the range of values of 88.23% with details;
Table 7. Validation User (Teacher)

| No | Scoring Aspects | Score |
|----|-----------------|-------|
| 1  | Theory          | 39    |
| 2  | Language        | 8     |
| 3  | Graphics        | 28    |
| **Quantity** | 75 |
| **Percentage (%)** | **88, 23%** |

Based on the validation results of the three experts, the Ethnoscience-based digital teaching material product that was developed obtained the following results:

Table 8. Validation of Experts

| No | Assessment Aspect   | Score      |
|----|---------------------|------------|
| 1  | Material Expert     | 91,03%     |
| 2  | Media Expert        | 89,41 %    |
| 3  | User expert (Teacher)| 88, 23%   |
| **Percentage (%)** | **89,55 %** |

From the results of these percentages, the total average given is 89.55% and shows that the development of ethnoscientific-based digital teaching materials in Jember. Authentic patrol music in the sound sub-material is included in the "very valid" category, here is a graph of the results of the comparison of the expert team:

![Figure 1. Expert Validation Diagram](image)

After knowing the results of the validation of ethnoscientific-based digital teaching materials, the next step was to test the product to class VIII SMP students at MTs Negeri 2 Jember. Product trials were conducted to determine student responses to the attractiveness of ethnoscientific-based digital teaching materials. Response test data retrieval was carried out in two stages, namely small-scale trials with the aim of knowing the results of student analysis of the quality of the materials developed with a total of 6 students consisting of 3 students of class VIIH and 3 students of class VIIIE, the six students selected were students with Criteria; students who have never used flipbook applications and students who use internet networks in their learning methods. The results of a small trial obtained a percentage range of 80.76% or the product developed was "interesting". While large-scale trials were carried out to determine the quality and quantity of the product with the number of similar students 30 students each representing class VIIH and VIIIE, with student criteria such as small-scale tests, but there were differences in students who had previously taken small-scale tests. The response test on a large scale obtained a result of 87.28%, or the product developed was "very interesting". The following is the validation of student response test validations from both small and large scales:

Table 9. Student Response Test

| No | Student Response Test | Percentage % |
|----|-----------------------|--------------|
| 1  | Small scale test      | 80, 76       |
| 2  | Large-scale test      | 87, 28       |
DATA ANALYSIS

Ethnoscience based on sound sub material in class VIII SMP/MTs. This study uses a research and development research model or the so-called 4-D model developed by Thiagarajan. This development model has 4 stages, namely, (define, design, develop, Disseminate), but researchers only use 3 stages, namely (define, design, and develop). The researcher chose to use the 4-D model because the 4-D module presents systematic steps from preliminary analysis to producing a product, making it possible to produce ethnoscience-based digital teaching materials that suit the characteristics of schools and students.

Based on the results of interview observations in February 2021, researchers received information that students’ problems in understanding concepts and facts in science learning are in the physics branch. Students assume that physics is a difficult material because many formulas and concepts are difficult to understand and the books used in learning are only BSE and UKBM books, there are no supporting books that help students understand the concept of sound material. From this problem, the researcher wants to develop a teaching material in the form of a digital supplement book based on ethnoscience.

Researchers chose Ethnoscience-based supplement books because during learning the teacher never used flip books and monotonous learning used modern musical instruments so that students did not recognize traditional music that was still awake.

The material developed in this teaching material is sound material with an ethnoscience approach or community culture that is still awake. The following are aspects of the relationship between science and culture which are associated with the art culture of Jember patrol music with sound material. Aspects of science, sound comes from vibrations, and objects that vibrate. Sound is a longitudinal wave whose energy propagation requires a medium of introduction to be heard by the receptor. In patrol music, the punches performed by patrol music players result in tightness and estrangement on the surface of the musical instrument and the air column cavities on the musical instrument, resulting in the sound and sound of the instrument propagating through the medium of matter and air until it reaches the listener. The use of flipbooks helps convey information and material that is abstract and clarified with audio and pictures so that students can easily understand the concepts and formulas in the sound sub-material.

Ethnoscience-based digital teaching materials on sub-sound materials developed by research will then be validated by material expert validators, media experts, and user experts (Science teachers) to determine the feasibility of Ethnoscience-based digital teaching materials before testing them on students. The material expert validator is Mr. Dinar Maftukh Fajar, S.Pd., M.PFis. The results of the validation carried out by material expert validators on the development of Ethnoscience-based digital teaching materials in the sound sub material were obtained at 91.03% so that they were included in the very valid category with suggestions for correcting errors in letters, symbols, punctuation marks and also the effectiveness of the sentences used, while in the comments it is enough to show elements of ethnoscience. The content of the material in the ethnoscience-based digital supplement book is included in the very valid category, namely 91.03%, this is because the material has linked science elements with culture that is still maintained.

This is in accordance with the one on the speed of sound material, where sound propagating requires an intermediary medium. The medium that has the largest propagation is solid objects, the same as the basic material for making patrol musical instruments in the form of jackfruit wood so that the sound that comes from the patrol musical instrument the direction of the wave propagation is faster (Abdul, 2016).

Assessment of teaching materials for media expert validators is Mrs. Lailly Yunita Puspita S. Pd, M. Si. The results of the validation carried out by the material expert validator
on the development of Ethnoscience-based digital teaching materials on the sound sub-
material were obtained at 89.41% so that it was included in the very valid category with
suggestions for correcting errors on the cover, bibliography, writing source images, and a list
of tables. While the comments are enough and the attractive appearance of the design that is
presented is in harmony with the concept and theme. These results are in accordance with the
use of supplement books as complementary learning books, and the advantages of the
flipbook application as a medium that presents supporting features in the form of audio, video,
and so on (Suci, 2020). Meanwhile, in the assessment of teaching materials for expert user
validators (science teachers), Mr. Fatu Rosi M. Pd. For the results of the validation carried
out by expert user validators on the development of Ethnoscience-based teaching materials in
the sound sub-material, data validation was obtained by 88.23% so that it was valid with
suggestions for improving the content of devotion to God Almighty, considering the school
background is Madrasah Tsanawiyah. As for suggestions and comments that supplement
books are interesting media, because they link a culture that is still maintained with learning
materials, especially there is explanatory content regarding audio music related to the
material.

The product that has been validated by several validators will be tested on class VIIIH
and VIIIE students. This trial aims to determine student responses to products that have been
developed by researchers. The trial was carried out in two stages, namely small scale and
large scale. The small-scale test requires 6 students from each class representative, while the
large-scale test requires 30 students from class representatives as well. After conducting a
small-scale trial, it was obtained that a percentage of 80.76% was included in the valid
category by making minor revisions. These results were obtained due to incompatibility and
constraints in accessing the network on the media. Furthermore, the product is used in large-
scale trials. For the large-scale test, the percentage result is 87.28% which is included in the
very attractive category. It is proven by the enthusiasm of students both from suggestions and
comments regarding ethnoscience-based digital supplement book products, especially they
can get to know the culture that still exists around students. Based on the percentage of small-
scale and large-scale trial results obtained with a percentage of 80.76% and 87.28%, it can be
said that digital teaching materials (supplementary books) based on ethnoscience in patrol
music in the sound sub-material are in the very interesting category with product
development criteria in accordance with BNSP.

CONCLUSION
This research is a type of Research and Development research using a 4-D model by
Thiagarajan. The model has four stages, namely, Define, Design, Development and
Dissiminate. However, the researcher modified 4-D to 3-D or reached the Develop stage due
to time constraints, the time the research took place at the end of the year and odd semester
exams were held. The objectives of this study are, (1) to describe the level of validation of
ethnoscience-based digital teaching materials in the Jember Authentic patrol music in the
sound sub-material; (2) describe student responses to ethnoscience-based digital teaching
materials in Authentic Jember patrol music on sound sub-materials for class VIII SMP/MTs
students. With the subject of the variable assessment in the study, namely, material experts
and media experts consisting of lecturers and science teachers. The student response test in
this study was divided into 2, namely 6 students in the small-scale test and 30 students in the
large-scale test.

The results of this study stated that the development of ethnoscience-based digital
teaching materials obtained an average percentage of material expert validation tests of
91.03%, media experts 89.41%, and user experts (teachers) obtained results of 88.23% with
meet the very valid category and the product is very attractive. The results of the small-scale
trial response obtained an average percentage of 80.76% in the "interesting" category, while in the large-scale trial an average percentage of 87.28% was obtained in the "very interesting" category so that this ethnoscience-based digital teaching material can be used in supporting student learning without any revision.

REFERENCES
Abdul yasid and Dina Handayani. (2011). The Effect of Sound Wave Frequency on the Behavior of House Flies, Jurnal Musca Domestika, 190-96
Anak Agung. dkk. (2020). Contextual Teaching and Learning Model Based on Tri Kaya Parisudha Against Science Knowledge Competencies of Class V Students. Basic Education Department, and Ganesha Education University. Volum 2, No. 2, 73-82
Diana Susyari. (2020). Efforts to Improve Students' Understanding of Sound As Waves Through Problem Based Learning on Musical Instruments at SMAN 3 Bandung. Champion knot vol2, No 2.
Ida Bagus Brata. (2016). Local Cultural Wisdom Adhesives Banga Identity. Jurnal Bakti Saraswati Vol. 50, No 01, 9-10
Jeane Rende. (2020) Sound Physics Teaching Materials Integrated With Culture. Journal of Physics Education unima Vol 1, No.1 Pemkab Jember. (Juni, 2021). Together Make Patrol Music a Cultural Heritage Not belonging to Jember. Retrieved from https://www.jemberkab.go.id/bersamawujudkan-musik-patrol-sebagai-warisan_budaya-tak-benda-milik-jember/
Prastowo, Andi. (2016) Development of Thematic Teaching Materials. Jakarta: KENCANA Putri Sarrini dan Kompyang Selamet. (2019). Development of Balinese Ethnoscience Teaching Materials for Prospective Science Teachers. Journal of Mathematics, Science and Learning Vol. 13, No 1, 27-39
Sahlan. (2016). Learning Evaluation: A Practical Guide for Educators and Prospective Educators. Jember: STAIN PRESS
Ningsih, Sezy Silviya. 2021. Development Of Science-Literacy Based Pocket Book On Global Warming Materials For Junior High School Students. INSECTA, Vol. 2, No. 2, 144-145
Sukesty, Ria. dkk. (2019). The Potential of Ethnoscience in Physics Learning on Vibration, Waves and Sound Materials. Seminar Nasional Pendidikan Fisika V, 1-6
Sugiyono. (2019). Research & Development Methods Research and Development. Bandung: Alfabeta
Wahyudin, Undang Ruslan. (2020). Education Management (Theory and Practice in the Implementation of the National Education System. Sleman: CV Budi Utama
Suci Prihatiningsih. (2020). Physics Learning By E-Modul , Fakultas Pertanian Universitas KH. A. Wahab Hasbullah.