JPPIPA 8(6) (2022)

Science Education Research Journal

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

Digital Module Innovation Based on Exploration of Physics Concepts Containing Local Wisdom "Making Traditional Snacks" to Support the Formation of Pancasila Students

Eti Elisa[1], Audri Mely Prabandari[1], Elma Tri Istighfarini[1], Haniyah Alivia[1], Latifa Widi Inayati Hamidah[1], Lailatul Nuraini[1*]

[1]Physics Education Study Program, Faculty of Teacher Training and Education, University of Jember, Jember, East Java, Indonesia

Received: September 21, 2022
Revised: November 30, 2022
Accepted: December 28, 2022
Published: December 31, 2022

Corresponding Author:
Lailatul Nuraini
lailatul.fkip@unej.ac.id

DOI: 10.29303/jppipa.v8i6.2171

Abstract: Learning physics can be associated with the culture of society. Culture or local wisdom is the identity or characteristic of an area. Traditional snacks are important to be preserved because they are unique in terms of culture. Studies on the concept of physics in traditional snacks can be used as learning materials in the form of digital modules. This study aims to analyze the concept of physics in traditional snacks, as well as describe the effectiveness of using digital modules based on exploration of physics concepts containing local wisdom "traditional snacks" in order to realize Pancasila students. This research method is research & development with ADDIE development model. The result of the research is the identification of physical concepts in the traditional snacks of dawet, klepon, putu, egg rolls, and cotton candy. The physics concept is packaged in a digital module. The results of the digital module validation with a valid category (4.32). The n-gain result is 0.71 (high category) at SMAN 2 Jember, 0.69 (medium category) at SMAN 4 Jember and 0.37 (medium category) at SMAN 5 Jember. The results of student responses to digital modules for three school were 76.67% had a positive response category. Thus, this digital module can be used more widely as a learning medium to strengthen the profile of Pancasila students.

Keywords: Traditional snacks; Physics concepts; Digital modules; Pancasila students

Introduction

Education is a process in which students will develop affective, cognitive and psychomotor abilities (Syahroni et al., 2016). Innovation related to existing education in Indonesia must be sourced in the field, even demands in the global era cause fundamental changes in education (Kadi et al., 2017). Local wisdom is knowledge related to local community activities to solve various kinds of problems in order to fulfill community needs (Njatrijani, 2018). Local wisdom related to education contains content and the learning process about local potential and uniqueness which aims to shape students' understanding of local wisdom in their place of residence. This local wisdom is taught to students with the aim that students can get to know the natural, social and cultural environment, can have skills.

Physics has a scope that contains all elements related to nature. Physics is a science that studies the characters, phenomena, interactions, symptoms, energy, and cause-and-effect relationships from a subatomic particle (micro cosmos) to a very large system (macro cosmos) (Lambaga, 2019). According to Suhendi et al. (2018)states that physics is a basic science for the development of science and technology, so that physics plays an important role in the student learning process. When viewed from its own actual history, physics is included in the oldest science that has been used since ancient Greece. There are several famous Greek philosophers such as Aristotle, Plato, Descartes, Archimedes, and Pythagoras who were the most influential people in the development of physics in ancient Greece. These characters are people who study and observe what, how, and why natural phenomena

How to Cite:
Elisa, E., Prabandari, A.M., Istighfarini, E.T., Alivia, H., Inayati, H.L.W., & Nuraini, L. (2022). Digital Module Innovation Based on Exploration of Physics Concepts Containing Local Wisdom "Making Traditional Snacks" to Support the Formation of Pancasila Students. *Jurnal Penelitian Pendidikan IPA*, *8*(6), 2923–2932. https://doi.org/10.29303/jppipa.v8i6.2171

and inanimate objects occur. This phenomenon itself is commonly referred to as a physical phenomenon. Physical phenomena are natural events that contain physical variables (Harefa, 2019). These physical variables can later be expressed in the form of numbers (quantitative).

In this era of globalization, the young generation is the spearhead of future determinants who have a great responsibility in determining how the fate of the Indonesian nation will be in the future. It is at this age that the importance of forming the character that exists within the human being itself. In learning physics, there is a curriculum that requires students to think creatively and reason critically (Susilawati, 2014). As the next generation of good Indonesians, students should have character as Pancasila students who always behave based on Pancasila which is the Basic State of Indonesia. While Pancasila itself is the basis and ideology of the state is the result of the agreement of the founding fathers of the nation when the Indonesian state was founded, until now in the era of globalization, the Indonesian state still adheres to Pancasila as the basis of the state (Lestari et al., 2019).

Snacks are traditional Indonesian foods on the market, especially many in traditional markets. Market snacks are divided into 2 types, namely traditional market snacks and modern market snacks. Traditional market snacks have a taste, shape, and appearance that still maintains the original style (Mayasari et al., 2021). Meanwhile, according to Yenti et al. (2018), traditional snacks are a form of culture by having regional characteristics and reflecting the natural potential of each region. Snacks are not only used as nutritional fulfillment but also used in maintaining human relationships. Furthermore, local wisdom in the form of traditional snacks can be used as a learning resource for students. According to Suarta et al. (2022), local wisdom can be a teacher's tool in guiding students to be better in achieving the goals of the learning itself.

One form of packaging learning resources is in the form of modules. According to Yusuf (2020), the module has a self-contained nature which means that the packaging of the module in a unified whole in order to achieve certain competencies and has the nature of helping and encouraging readers to learn on their own and not depend on other media. Modules are said to be systematic, can motivate readers, and are interesting if they are designed for independent learning systems, complete and systematic learning programs, contain objectives, study activities and evaluations, are presented communicatively, can replace several teacher roles, have a focused and directed language, and prioritize user learning activities. Digital modules can make learning media that were previously documented and distributed using print media, become using electronic media. Utilization of digital modules as learning media begins with the use of ICT through hardware and software systems that contain information for readers. Digital modules can be utilized in several forms such as audio (hearing), visual (sight), audio-visual (hearing-sight), and interactive multimedia (Cahyadi, 2019). The advantages of digital modules are that students can learn independently, learning is more interactive, the display is user friendly, easy access, practical to read, and does not require paper, thereby reducing paper use. Digital modules can be utilized in several forms such as audio (hearing), visual (sight), audio-visual (hearing-sight), and interactive multimedia. The advantages of digital modules are that students can learn independently, learning is more interactive, the display is user friendly, easy access, practical to read, and does not require paper, thereby reducing paper use. Digital modules can be utilized in several forms such as audio (hearing), visual (sight), audio-visual (hearing-sight), and interactive multimedia. The advantages of digital modules are that students can learn independently, learning is more interactive, the display is user friendly, easy access, practical to read, and does not require paper, thereby reducing paper use.

Studies on the concept of physics in traditional snacks are used as learning materials in the form of digital modules. The traditional snacks that are reviewed in terms of physics concepts are klepon, kue putu, and dawet. Some of the physical concepts contained in these traditional snacks are pressure, heat, and sound. A wave is a propagation of vibrational energy that propagates through a medium or without going through a medium (Halliday et al., 2010). Based on the medium, waves are divided into two, namely electromagnetic waves and mechanical waves. Mechanical waves are waves that have a direction of propagation and require an intermediary medium while electromagnetic waves are waves that do not require a medium for the direction of propagation. Sound is an example of a longitudinal type of mechanical wave that propagates and its source is a vibrating object. Sound can be heard because the vibration of the object as the sound source vibrates the air around and through the medium of air the sound propagates to the eardrum with periodic variations in air pressure along its propagation path. Periodic air pressure can vibrate the eardrum membrane. Sounds that can be heard by humans with frequencies between 20 Hz to 20 kHz (Yasid et al., 2016). While the concept of heat, according to Nurhidayat et al. (2020), heat is one of the concepts of physics regarding heat transfer accompanied by energy transfer. Heat is energy that can be transferred or transferred. Transfer of heat is caused by the transfer of energy from a place with a high temperature to a place with a lower temperature.

In addition to the three snacks above, there are also several traditional snacks that use the physics concept of

momentum rotation, including: egg rolls and cotton candy. The basis for the discussion of rotational motion and angular momentum is rotational kinetic energy, moment of inertia, torque, torque and angular acceleration relationships, total kinetic energy, kinetic energy in rolling objects, angular and linear momentum relationships, and the law of conservation of angular momentum. In analogy to the principle of conservation of linear momentum, it was found that the angular momentum of the system is conserved if there is no external torque acting on the system (Amnirullah, 2015).

Based on the description of the problem about the importance of learning physics by raising local wisdom as a source of student learning, the local potential of Jember, namely traditional snacks that need to be introduced more closely to students, as well as introducing more deeply related to the concept of physics in the process of making traditional snacks, this study discusses on Digital Module Innovation Based on Exploration of Physics Concepts Containing Local Wisdom "Traditional Snack Making" to Support the Formation of Pancasila Students. The objectives of this study include: 1) Analyzing the physics concepts that exist in local wisdom of making traditional snacks, and 2.

Method

The type of research used is the Research and Development (R&D) method. The development of digital module teaching materials uses a systematic development design model, namely the ADDIE model (Harjanta et al., 2018). The ADDIE model is shown Figure 1.

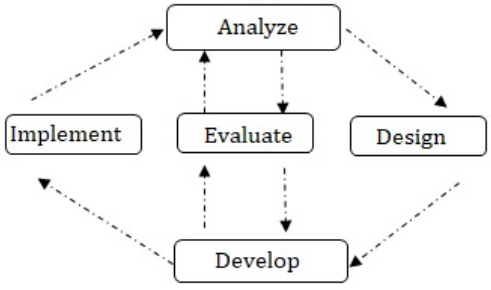

Figure 1. ADDIE model

This learning design model has a systematic level as an aspect of the approach that is often used or practiced for printed and digital-based learning materials. The research subjects in the form of developing a digital module based on physics concepts in local wisdom of making traditional snacks for the realization of Pancasila students are students of class X SMA in the odd semester of the 2022/2023 academic year.

Research on the development of this digital module makes traders who make traditional snacks the research respondents. Researchers conducted observations and interviews as well as documentation of how to make traditional snacks made by snack-making traders consisting of traders of Putu Ayu, Dawet cakes, cotton candy, egg rolls and Klepon. The results of the development of this digital module will be tested on high school students located in Jember, especially class X. This is based on the understanding that middle class students have excellent reasoning and problem solving abilities compared to other classes and in class X has implemented an independent curriculum at strengthening Pancasila student profile.

As for the data collection itself, using the techniques of observation, interviews, questionnaires, and tests. The observation technique is carried out when researchers collect data directly in the field, namely the market as a gathering place for traditional snack sellers. Researchers observed directly from the beginning to the end of the process of making traditional snacks. Then in addition to making observations, researchers conducted interviews directly with traditional snack sellers regarding the process of making snacks in more detail and detail. This is so that the information or data collected is more valid. The questions asked to the seller have been prepared beforehand, so that asking questions directly will be more systematic and structured. Then in addition to collecting data through the seller, the researcher also collected data through a questionnaire given to class X SMA students to answer. This response questionnaire can be given directly in sheet form or in the form of a web that will adjust to the increasing and decreasing conditions of the Covid-19 pandemic. In addition to the questionnaire, students will also be given a test in the form of multiple-choice questions that contain reasoned questions that require students to answer using students' reasoning and are related to the process of making traditional snacks.

Results and Discussion

The research was carried out in July-August 2022. The implementation began with requesting a research permit letter through the Faculty of Teacher Training and Education, University of Jember. Observation activities to traditional snack traders on 19-25 July 2022. Furthermore, the results of traditional snacks were analyzed for physical concepts and developed into a digital module on 10-12 August 2022. Next, expert validation was carried out on the digital module on 15-18 August 2022. The permit letter was submitted to the school on 19–22 August 2022. The study was conducted on 23–26 August 2022.

The stages in development research with the ADDIE development model are divided into 5 stages (Bakhri, 2019), namely:

Analysis Step

At this stage, an analysis of the concept of physics is carried out on the processing of dawet, klepon, putu, egg rolls, and cotton candy. After the analysis was carried out, it was found that there were several physical concepts used in the processing of this traditional snack. The following is an analysis of the concepts of physics in traditional snacks:

- *Analysis of Physics Concepts in Making Egg Rolls*
Temperature Concept

The process of making egg rolls has the concept of temperature. This event is depicted in Figure 2.

Figure 2. Egg roll making

In this process when turning on the stove on medium heat where the heat from the fire moves to the iron pan and the oil will turn into heat, this is the concept of heat, namely conduction. Temperature is the degree of heat of an object with the measuring instrument used to measure temperature is a thermometer in order to obtain a valid measurement value (Indarwati et al., 2019). The concept of temperature occurs when the oil is hot then put the egg mixture in a pan with hot oil so that the dough will quickly cook and form like nests. So the hotter or greater the temperature given, the faster the egg rolls will cook. The equations that meet the temperature concept are as equation 1 (Myson et al., 2020).

$$Q = m\,c\,T \tag{1}$$

Circular Motion Concept

The concept of circular motion in egg rolls occurs when pouring the egg mixture a little high by doing a round on hot oil which then the eggs will cook like a nest and then rolled up with a skewer like doing a circular motion. The repetitive (circular) movement triggers the magnitude of the period or in one round and the frequency or rotation in units of time, as well as the angular velocity when turning eggs with a skewer. So it can be explained that an object moving in a circle will have an angular velocity (ω). The greater the angular velocity, the object experiences angular acceleration (α), where angular acceleration is the change in angular velocity per unit time (Yohandri et al., 2022). The equation regarding the concept of circular motion that fulfills is:

$$a = \frac{v^2}{r} \tag{2}$$

- *Analysis of Physics Concepts in Making Klepon*
Temperature and Heat

In the cooking process, klepon also applies the concept of heat transfer physics because when cooking, the bottom water gets heat from the heater, the water particles expand so that they become lighter and move up and are replaced with cold water particles from the top. In this way, the heat from the lower water is transferred with the flow of water to the upper part. In this process, convection occurs.

Figure 3. Making klepon traditional snacks

The next physical concept is at the stage of cooking the klepon dough, in this process when turning on the stove on medium heat where the heat from the fire moves to the pan the water will turn into hot, this is the concept of heat, namely conduction. However, the concept of temperature occurs when hot water will boil and then enter the pan dough so that the dough will cook quickly and will float. So the hotter or greater the temperature given, the faster the dough will cook too. In this process water which initially has a temperature of 29°C will boil at a temperature of 89°C.

Pressure

In the process of making traditional klepon snacks there is a physics concept of pressure, which occurs when the dough is mixed by hand, the dough will be pressed to get enough density to make the dough chewy and not hard. In addition, during the formation of the dough it becomes round when it has been filled with stuffing. In this process, the pressure applied greatly affects the shape and density of the dough, if you press too much the sides of the dough will leak when cooking, but if you apply too light pressure, the dough will easily

leak before cooking or when cooked later. The pressure equation that satisfies is equation 3.

$$P = \frac{F}{A} \quad (3)$$

Archimedes' law

The last stage in the klepon before being packaged is the ripening stage where, in the event of making klepon when the klepon filling sinks, it shows that the dawet dough has a greater density than the boiling water, and will float when cooked, this is because the dough has decreased in mass so that the kelpon cooked ones will float. This is seen to apply in accordance with Archimides' Law (Safitri et al., 2020).

- *Analysis of Physics Concepts in Dawet Traditional Snacks Coagulation*

Based on the analysis of data from observations and literature that has been carried out, the following is an exploration of the concepts of physics in the process of making dawet traditional snacks. In the manufacture of dawet, there is a process of mixing lime water which is deposited into the dawet dough so that lumps are formed which are the stuffing of the dawet. Analysis of the physical concept that occurs in this process is the occurrence of mechanical and chemical coagulation processes because it is carried out by providing heating treatment and using lime water (CH3COOH) to coagulate the dawet dough. According to Rahimah et al. (2018), coagulation is the mixing of coagulants with rapid stirring to stabilize colloids and solids. In the process of making dawet, one of the materials used is water enjet which serves to make dawet chewy.

Temperature and Heat

In addition, the dawet cooking process also applies the concept of temperature physics because this cooking process must ensure that the temperature is really hot before the dough is poured into the pan. This is to speed up the cooking process and make it easier when stirring the dawet dough so that when it is cooked it will clot perfectly because if the temperature is not hot at the time of cooking, the dough will clot quickly and the result will not clot evenly.

Pressure

The last process in making dawet is the process of printing the dough that has been cooked. When the dough is pressed firmly it will produce a long dawet, but when the dough is pressed with normal pressure it will produce a small dough. Not only that, when the dawet is served, when the dawet sinks, it shows that the dawet dough has a greater density than the dawet coconut milk. This shows the existence of a physical concept in the form of Archimedes' Law in the presentation of dawet.

Figure 4. The Process of making dawet traditional snacks

- *Analysis of Physics Concepts in Making Cotton Candy Uniform Circular Motion*

The process occurs when the sugar that is inserted into the hole in the machine has started to release the thin cotton around it. These cottons must be rolled or wrapped around a bamboo skewer using the principle of Regular Circular Motion. Where is the circular motion made by the seller's hand when rolling cotton on the bamboo Where the circular motion of the seller's hand when rolling cotton on the bamboo is strongly influenced by the mass of the cotton candy, the radius of the cotton candy formed, and the centripetal force that affects it. Where if the mass and fingers of the cotton candy formed are bigger, the seller's hand movement when rolling the cotton candy will slow down.

Figure 5. Making traditional snacks of cotton candy

Heat (Using Spirit)

The heat that is formed from this cotton candy maker comes from the use of spirits. Inside this tool has a wick that has been made in such a way that it is connected to the spirit as the main fuel in it which then when the spirit is ignited, it will produce a fire in the hole in the middle of this cotton candy maker.

EGG (Dynamo and ACCU)

In the rotary tool that is in the middle of this sweet arum maker, it actually utilizes a dynamo drive to allow this part of the tool to rotate. The working principle of this dynamo on a cotton candy machine is to move the furnace quickly. In addition to using this cotton candy machine dynamo, you can also use ACCU or what we usually call a battery. This means that the electrical power needed by the tool comes from the battery. The working principle of this battery is that when the battery is used, the two electrodes will slowly turn into lead sulfate. In this process, not many electrons are released from the lead electrode, resulting in an electric current coming from the lead dioxide plate. The equations that meet the concept of induced emf are equation 4.

$$E = \frac{d\Phi}{dt} \quad (4)$$

- *Analysis of Physics Concepts in Making Putu*

Evaporation

The physical concept of evaporation in the putu-making process is used in the cooking process, because in this process the putu is cooked in a pot with holes, under which there is a furnace that emits steam at a high temperature. This steam itself comes from boiling water that has been heated under it so that it releases hot steam which is used to steam or heat the putu cake dough. In the process of cooking itself, the steam used must be adjusted to the amount of putu cake that is cooked. However, the steam used tends to have a moderate and stable temperature, so it depends on how long it takes to ripen. The more the number of putu cakes cooked, the longer the time required.

Figure 6. Making traditional snacks putu

Sound Wave

The concept of sound wave physics in the manufacture of putu is found in the marker of the seller of putu. This tool will usually sound when the seller is not steaming the putu cake. This is done because the sound of this tool requires water vapor to press up and out through the holes that have been made in the tool, thus producing a sound like a whistle. So that the greater the water vapor used, the greater the sound waves produced, and vice versa. The sound equations that meet are as follows as equation 5.

$$V = \frac{s}{t} \quad (5)$$

Pressure

The physics concept of pressure in the making of putu occurs when screening the dough because during the screening process the dough must be pressed to get a dough that has a texture like fine sand. In addition, when entering the dough in the bamboo mold. In this process the pressure applied greatly affects the time used for cooking. The greater the pressure, the longer the putu will ripen. However, the lower the pressure, the faster the putu will cook.

Heat

The physics concept of heat transfer in the manufacture of putu is during the cooking process because the putu is cooked in a pot with a hole underneath which there is boiled water. So that the bottom water gets heat from the heater, the water particles expand so that they become lighter and move up and are replaced with cold water particles from the top. In this way, the heat from the lower water is transferred with the flow of water to the upper part. In this process, convection occurs.

Planning Phase (Design)

The process of making the E-Module begins with a survey of traders who will serve as resource persons for making traditional snacks of dawet, klepon, putu, egg rolls, and cotton candy to analyze the physics concept. After that, observations were made on the manufacture of traditional snacks to determine what physical concepts exist in the process of making these traditional snacks. After that, it is continued by looking for sources or references in the form of books, journals, and the internet related to the concepts of physics that exist in the observations of the traditional snacks of dawet, klepon, putu, egg rolls, and cotton candy. The data and sources obtained to analyze the concept of physics in traditional snacks are used as materials for making E-Modules by making them using the articulate storyline application.

Development Phase

A digital module based on Exploration of Physics Concepts Loaded with Local Wisdom "Traditional Snack Making" to Support the Formation of Pancasila Students was created using an articulate storyline application and used in an application form. The digital module that was created was further validated by the Lecturer of Physics Education at the University of Jember in 15 August 2022 for the first Media Expert and 17 – 18 August 2022 for the second Media Expert. There are several inputs related to the digital module that is made, namely by improving the image or display. Validation is carried out by three validators. The first

validation result is 4.40 in the valid category, the second validator result is 4.50 is very valid, and the third validator is 4.05 in the valid category. The display of the digital module exploring the concept of physics with local wisdom in making traditional snacks is shown in Figure 7.

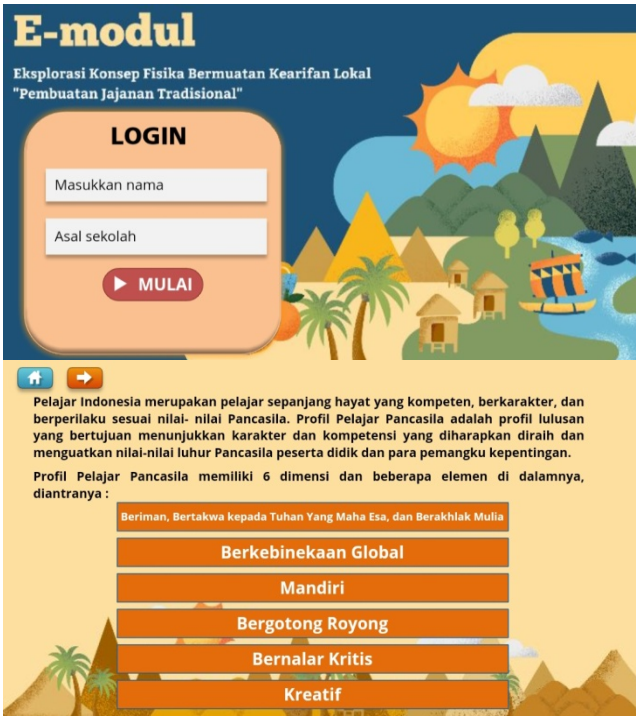

Figure 7. Display of the digital module

Implementation Phase (Implementation)

In the implementation activities, the research was conducted at SMAN 2 Jember, SMAN 4 Jember, and SMAN 5 Jember. A pretest was conducted first to measure the students' prior knowledge. The pretest was carried out for 40 minutes with multiple choice questions accompanied by reasons with a total of 10 questions. Students work on pretest questions using google forms. After the pretest was carried out, students received a learning process on physics concepts obtained from the analysis of traditional snacks of dawet, klepon, putu, egg rolls, and cotton candy through digital modules that had been distributed previously. Before studying the electronic module, instructions for using the digital module are given first. Students use the digital module provided to understand the profile of Pancasila students, analyze physics concepts in the form of pressure, changes in state of matter, coagulation, temperature and heat, Archimedes' law, induced emf, circular motion, coagulation, sound waves, and precipitation. There are pictures, making videos, and practice questions on the digital module so that students can imagine events in real and hone students' analytical skills. At the end of the activity, students carried out a 40-minute posttest to measure the effectiveness of the use of the applied digital module. Student learning outcomes which include pre-test and posttest produce statistical data as shown in Figure 8.

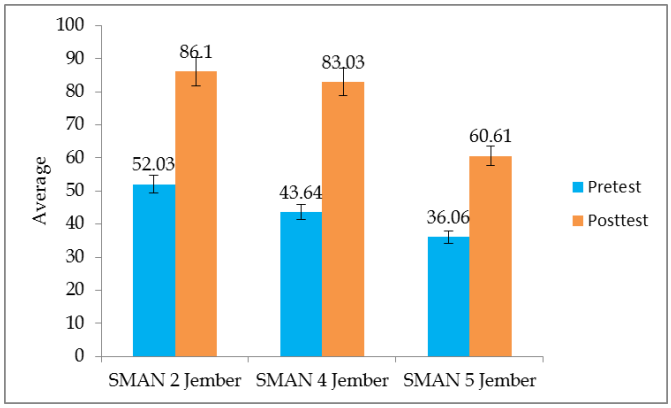

Figure 8. Graph of learning outcomes

These results indicate that there is an increase in learning outcomes in the three high schools. This increase is indicated by an increase in the results of the pretest to the posttest. The increase in learning outcomes can be shown through the n-gain in Table 1.

Table 1. Value of N-Gain

School Name	N-Gain Value	Criteria
SMAN 2 Jember	0.71	High
SMAN 4 Jember	0.69	Medium
SMAN 5 Jember	0.37	Medium

Table 2. Value of T-Test

School Name	T-Test Value
SMAN 2 Jember	0.00
SMAN 4 Jember	0.00
SMAN 5 Jember	0.00

Pre-test and post-test data tested using SPSS showed that the significance was less than 0.05 so that this digital module based on exploration of physics concepts containing local wisdom of traditional snacks had an effect on student learning outcomes.

Stage of Evaluation (Evaluation)

At this evaluation stage, the researcher looked at the students' responses. After the posttest activity ended, the students were asked to fill out a response questionnaire which was distributed via a google form. The response indicators used are the ease of use of the application, the appearance of the application, and the ease of application as student teaching materials. The results of the research related to the response, namely SMAN 2 Jember, the results of the response were 79.6% with positive criteria, 73% with positive criteria for SMAN 4 Jember, and 77.4% in SMAN 5 Jember with positive criteria as shown in Figure 9.

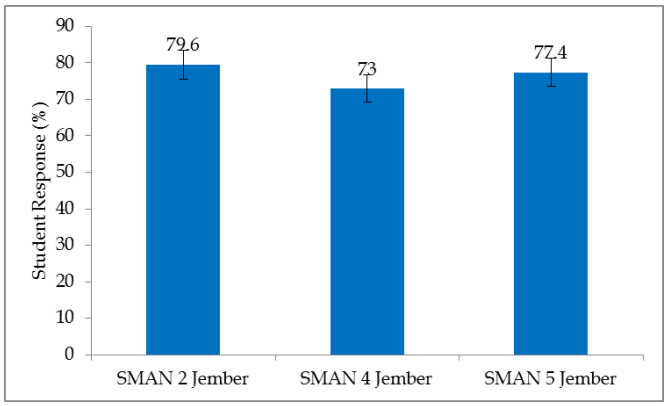

Figure 9. Student response graph

Based on the results of the research that has been carried out, it can be said that the implementation of the digital module received a positive response. Several studies relevant to digital module innovation based on exploration of physics concepts containing local wisdom "making traditional snacks" to support the formation of Pancasila students, namely Utami et al. (2018) which states that ethnomathematical-based teaching materials with the use of local cultural content around students can be used as a contribution to ability in problem solving without leaving cultural values. Research by Latifah et al. (2020) shows the results that digital module teaching materials using the Kvisoft Flipbook Maker application are in a fairly good category and with very reliable category reliability, so that digital modules are suitable for use in learning and student responses to Physics digital modules have a good category through trials. limited. Research by Nuraida et al. (2022) shows the results that show that e-comic is a media that is suitable for use in learning media with the results of the practitioner test showing that digital comics are suitable for use for students with the results of student responses being very fond of learning media in the form of digital comics. Meanwhile, Nisa et al. (2021) suggested that the development of digital modules with the help of SIGIL can have a positive effect on increasing the effectiveness of physics learning. In addition, the results of student responses to the use of local wisdom-based digital modules are in the positive category (Midroro et al., 2021).

Conclusion

Based on the description of the results and discussion, it can be concluded as follows: 1) The concepts of physics in the manufacture of traditional snacks include: (a) cotton candy, there is the concept of induced emf, circular motion, (b) egg rolls, there is the concept of circular motion and displacement. heat, (c) dawet, there are physical concepts of coagulation, pressure and precipitation, as well as Archimedes' law, (d) klepon, there are physical concepts of temperature and heat change, pressure, and Archimedes' law, and (e) Kue Putu, there is the concept of sound waves , pressure, and heat transfer; and 2) The effectiveness of using the module is in the high category at SMAN 2 Jember, namely with a large n-gain value of 0.71, SMAN 4 Jember with a large n-gain value of 0.69, and SMAN 5 Jember with a large n-gain value of 0.37 . Meanwhile, the t-test showed significant results for using Digital Module had an effect on student learning outcomes. While the response analysis obtained from this study, namely SMAN 2 Jember, the results of the response were 79.6% with positive criteria, 73% with positive criteria for SMAN 4 Jember, and 77.4% with positive criteria for SMAN 5 Jember. Thus, digital modules based on exploration of physics concepts containing local wisdom in the manufacture of traditional snacks can be used as an effective learning resource. 4% have positive criteria. Thus, digital modules based on exploration of physics concepts containing local wisdom in the manufacture of traditional snacks can be used as an effective learning resource. 4% have positive criteria. Thus, digital modules based on exploration of physics concepts containing local wisdom in the manufacture of traditional snacks can be used as an effective learning resource. These results can achieve 3 aspects of the Pancasila Student Profile, including Global, Creative, and Independent Bhinneka

Acknowledgment

We would like to thank the Directorate of Learning and Student Affairs (Belmawa) for organizing the 2022 Student Creativity Program (PKM) and funding this research activity. In addition, we also thank the traditional snack traders in the Jember area who have been willing to become research respondents, as well as to the schools, namely SMA Negeri 2 Jember, SMA Negeri 4 Jember and SMA Negeri 5 Jember as locations for implementing digital modules based on local wisdom for making traditional snacks. as an effort to support strengthening the profile of Pancasila students.

Reference

Amnirullah, L. (2015). Analisis Kesulitan Penguasaan Konsep Mahasiswa pada Topik Rotasi Benda Tegar dan Momentum Sudut. *Jurnal Fisika Indonesia*, *19*(56), 34–37. https://doi.org/10.22146/jfi.24356

Bakhri, S. (2019). Animasi Interaktif Pembelajaran Huruf dan Angka Menggunakan Model ADDIE. *INTENSIF: Jurnal Ilmiah Penelitian Dan Penerapan Teknologi Sistem Informasi*, *3*(2), 130. https://doi.org/10.29407/intensif.v3i2.12666

Cahyadi, R. A. H. (2019). Pengembangan Bahan Ajar Berbasis Addie Model. *Halaqa: Islamic Education Journal*, *3*(1), 35–42.

https://doi.org/10.21070/halaqa.v3i1.2124

Halliday, D., Resnick, R., & Walker, J. (2010). Fundamentals of Physics. In *Fundamentals of Physics*. New York: John Wiley & Sons. https://doi.org/10.12987/9780300206791

Harefa, A. R. (2019). Peran ilmu fisika dalam kehidupan sehari-hari. *Jurnal Warta*, *60*(April), 1–10. https://doi.org/10.46576/wdw.v0i60.411

Harjanta, A. T. J., & Herlambang, B. A. (2018). Rancang Bangun Game Edukasi Pemilihan Gubernur Jateng Berbasis Android Dengan Model ADDIE. *Jurnal Transformatika*, *16*(1), 91. https://doi.org/10.26623/transformatika.v16i1.894

Indarwati, S., Respati, S. M. B., & Darmanto, D. (2019). Kebutuhan Daya pada Air Conditioner Saat Terjadi Perbedaan Suhu dan Kelembaban. *Jurnal Ilmiah Momentum*, *15*(1). https://doi.org/10.36499/jim.v15i1.2666

Kadi, T., & Awwaliyah, R. (2017). Inovasi Pendidikan : Upaya Penyelesaian Problematika Pendidikan Di Indonesia. *Jurnal Islam Nusantara*, *1*(2), 144–155. https://doi.org/10.33852/jurnalin.v1i2.32

Lambaga, I. A. (2019). Tinjauan Umum Konsep Fisika Dasar. In *Deepublish:Sleman*. Sleman: Deepublish.

Latifah, N., Ashari, & Kurniawan, E. S. (2020). Pengembangan e-modul fisika untuk meningkatkan kemampuan berpikir kritis peserta didik. *Jurnal Inovasi Pendidikan Sains*, *01*(01), 1–7. http://jurnal.umpwr.ac.id/index.php/jips/article/view/570

Lestari, E. Y., Janah, M., & Karima Wardanai, P. (2019). Menumbuhkan Kesadaran Nasionalisme Generasi Muda Di Era Globalisasi Melalui Penerapan Nilai-Nilai Pancasila. *ADIL Indonesia Journal*, *1*(1), 574–582. http://jurnal.unw.ac.id:1254/index.php/AIJ/article/view/139

Mayasari, I., Sugeng, N. W., & Ratnaningtyas, H. (2021). Peran Bauran Pemasaran Terhadap Keputusan Pembelian Generasi Milenial: Studi Jajanan Tradisional. *At-Tadbir : Jurnal Ilmiah Manajemen*, *5*(2), 135. https://doi.org/10.31602/atd.v5i2.4799

Midroro, J. N., Prastowo, S. H. B., & Nuraini, L. (2021). Analisis Respon Siswa Sma Plus Al-Azhar Jember Terhadap Modul Fisika Digital Berbasis Articulate Storyline 3 Pokok Bahasan Hukum Newton Tentang Gravitasi. *Jurnal Pembelajaran Fisika*, *10*(1), 8. https://doi.org/10.19184/jpf.v10i1.23762

Myson, M., & Yusiana, V. (2020). Pemanfaatan Panas Sisa Pembakaran Bata Merah di Daerah Setiti Kab. Muaro Jambi. *Jurnal Civronlit Unbari*, *5*(1), 32. https://doi.org/10.33087/civronlit.v5i1.64

Nisa, U., Yuliani, H., Syar, N. I., & Nastiti, L. R. (2021). Meta Analisis Pengembangan E-Modul Berbantuan Sigil Pada Pembelajaran Fisika. *OPTIKA: Jurnal Pendidikan Fisika*, *5*(1), 64–73. https://doi.org/10.37478/optika.v5i1.960

Njatrijani, R. (2018). Kearifan Lokal Dalam Perspektif Budaya Kota Semarang. *Gema Keadilan*, *5*(1), 16–31. https://doi.org/10.14710/gk.2018.3580

Nuraida, S., Bhakti, Y. B., & ... (2022). Pengembangan Komik Digital Berbasis Metode Demonstrasi sebagai Suplemen pada Pokok Bahasan Massa Jenis Zat. *… Physics: Journal of Physics …*, *Education.4(1*, 68–74. https://journal.unindra.ac.id/index.php/jpeu/article/view/1002

Nurhidayat, W., Aprilia, F., Wahyuni, D. S., & Nana, N. (2020). Etno Fisika Berupa Implementasi Konsep Kalor Pada Tari Mojang Priangan. *ORBITA: Jurnal Kajian, Inovasi Dan Aplikasi Pendidikan Fisika*, *6*(1), 138. https://doi.org/10.31764/orbita.v6i1.2097

Rahimah, Z., Heldawati, H., & Syauqiah, I. (2018). Pengolahan Limbah Deterjen Dengan Metode Koagulasi-Flokulasi Menggunakan Koagulan Kapur Dan Pac. *Konversi*, *5*(2), 13. https://doi.org/10.20527/k.v5i2.4767

Safitri, L. N., Fahrudin, & Jumadi. (2020). Comparison of students science process skills after using learning an experimental and virtual laboratory on Archimedes Laws. *Journal of Physics: Conference Series*, *1440*(1), 12079. https://doi.org/10.1088/1742-6596/1440/1/012079

Suarta, I. M., Noortyani, R., Yarsama, K., & Adhiti, I. A. I. (2022). The role of Teachers' Indigenous Knowledge and Cultural Competencies in Enhancing Students' Engagement and Learning Outcomes. *Journal of Ethnic and Cultural Studies*, *9*(1), 244–264. https://doi.org/10.29333/ejecs/1025

Suhendi, H. Y., Ramdhani, M. A., & Irwansyah, F. S. (2018). Verification concept of assesment for physics education student learning outcome. *International Journal of Engineering and Technology(UAE)*, *7*(3.21 Special Issue 21), 321–325. https://doi.org/10.14419/ijet.v7i2.29.13646

Susilawati. (2014). Project based vocational skills in teaching materials for physics education. *International Conference on Physics*, 47–50. https://doi.org/10.2991/icp-14.2014.12

Syahroni, M. W., Dewi, N. R., & Kasmui. (2016). The effect of using digimon (Science digital module) with scientific approach at the visualization of students' independence and learning results. *Jurnal Pendidikan IPA Indonesia*, *5*(1), 116–122. https://doi.org/10.15294/jpii.v5i1.5800

Utami, R. E., Nugroho, A. A., Dwijayanti, I., & Sukarno, A. (2018). Pengembangan E-Modul Berbasis Etnomatematika Untuk Meningkatkan Kemampuan Pemecahan Masalah. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *2*(2), 268.

https://doi.org/10.33603/jnpm.v2i2.1458

Yasid, A., Yushardi, & Handayani, D. (2016). Pengaruh Frekuensi Gelombang Bunyi Terhadap Perilaku Lalat Rumah (Musca domestica). *Jurnal Pembelajaran Fisika*, *5*(2), 190–196. https://jurnal.unej.ac.id/index.php/JPF/article/download/3968/3096

Yenti, N. P., & Nurrizati. (2018). Kemas Ulang Informasi Permainan Tradisional Minangkabau di Kabupaten Pesisir Selatan. *Jurnal Ilmu Informasi Perpustakaan Dan Kearsipan*, *7*(1), 168–180.

Yohandri, Asrizal, & Chazanah, I. (2022). Digital experiment system of uniform circular motion with remote laboratory based on website. *Journal of Physics: Conference Series*, *2309*(1), 12038. https://doi.org/10.1088/1742-6596/2309/1/012038

Yusuf, Y. (2020). *Call for book Tema 3 (Media Pembelajaran)*. Surabaya: Jakad Media Publishing.