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Development of The SeToFi Podcast (History of Physics Figures) from Kelvin to Schrödinger as a Supplement to The Physics Course Basic

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ABSTRACT

According to the results of the Daily Social databoks survey with JakPat, podcast listeners in Indonesia are dominated by young people in the age range of 15-24 with a percentage of more than 20%. This study aims to determine the feasibility of the SeToFi (History of Physics Figures) podcast developed by researchers. The method used in this study is Research & Development (R&D) with the ADDIE model. The results of media and material validation obtained a percentage result of 94.29% each with the category of very good. The results of user assessment obtained a percentage result of 85.48% with the category of very good. Based on this data, an average percentage of 91.35% was obtained, therefore, it can be concluded that the SeToFi (History of Physics Figures) podcast media from Kelvin to Schrödinger is very feasible to be used as a supplement to basic physics courses.

Keywords: *Podcast, Spotify, from Kelvin to Schrödinger*

INTRODUCTION

The development of information and communication technology has introduced new media in the process of interaction and communication, which are then used in various fields (Syafrina., 2022). The use of technology in education is becoming increasingly important, especially in facilitating more interactive and engaging learning. Podcasts are an innovative tool for presenting information in an engaging and accessible way for college students. Podcasts provide a forum for delivering information in the form of narratives, interviews, and other audio materials. One form of digital technology that is developing is podcasts. The current use of podcasts has touched the field of Education as a learning medium (Dewi M., 2019).

In Indonesia, the audience has become more familiar with and use podcasts. The results of the Daily Social databoks survey with JakPat show that podcast listeners in Indonesia are

dominated by young people in the age range of 15-19 years as much as 22.1% and in the age range of 20-24 years as much as 22.2%. And the survey data shows that podcast listeners are decreasing in the increasing age range, with details in the age range of 25-29 years as much as 19.9%., at the age of 30-34 years as much as 15.7%., in the age range of 35-39 years as much as 11.8%., and in the age range of 40-44 years as much as 8.4% (Bayu, 2021)

Based on the results of an interview that has been conducted together with one of the Physics Education students at Sultan Ageng Tirtayasa University, the fact is that there are still many students who do not know about physics figures and their discoveries. This is also contained in the results of the survey that has been carried out, there are around 36.4% of 11 students who agree with the statement that the Basic Physics Course only discusses mathematical formulas. At Sultan Ageng Tirtayasa University itself, there is a History of Physics Course that discusses physicists but is not in demand until in the end the course is abolished. Therefore, the History of Physics is very important to support the learning of the Basic Physics Course.

Basic Physics is one of the courses that must be taken by all physics education students. In the learning process, students only learn theory and practice questions without knowing how the theory is used in daily life (Rahmat F., 2018). The main purpose of this course is to provide a basic understanding of the principles of physics that underlie natural phenomena. However, often the courses only focus on theoretical concepts and mathematical formulas, without providing an in-depth historical context.

Several previous studies (Hutabarat, 2020) explained that based on previous research and best practices that have been carried out by a number of universities, it can be concluded that podcasts are useful as a learning supplement medium for students. And also research (Mohamad Sulthoni, 2021), states that audio podcasts as a learning medium can focus students' attention, so that they are excited to participate in learning.

From the problems that have been described earlier, the researcher is interested in conducting research using podcast media as a medium for disseminating information about the history of physics figures, then this research is entitled "Development of the SeToFi Podcast (History of Physics Figures) From Kelvin To Schrödinger as a Supplement to Basic Physics Courses".

The purpose of this study is to find out how feasible the SeToFi (History of Physics Figures) podcast media from Kelvin to Schrödinger is a supplement to basic physics courses".

RESEARCH METHODS

The research method used in this study is using the Research & Development (R&D) method, R&D is a research approach to make new products or improve existing products. Sugiyono (2019: 752) states that the Research & Development (R&D) method is a research technique used to create a specific product and test how effective the product is. The researcher chose to use a model that has 5 stages, namely the Analysis, Design, Development, Implementation, and Evaluation stages, because this development model is very effective and dynamic. The model consists of five interconnected parts and is systematically arranged. The results of the stages of research and development are as follows:

1. *Analysis*

   At this stage, the researcher analyzes the background of the problem according to the conditions that occur in real life. Then analyze learning media that can be developed using current technological developments innovatively.

2. *Design*

   At this stage, the researcher makes preparations or designs for the product to be developed, starting from determining research objectives, making instruments to validate materials, media and users and also providing solutions to previous problems, namely producing podcast-based audio media products.

3. *Development*

   At this stage of development, the researcher began to compile what had been designed beforehand, namely making a narrative according to the discussion, making a cover to make the display more attractive, recording audio that would be uploaded to an online platform. Then product validation is carried out to media experts and material experts to find out the feasibility of the product developed.

4. *Implementation*

   At this stage, a trial of the media that has been made is carried out. By conducting validation tests of media and material experts as well as user trials to students. This trial was carried out so that the feasibility of the product that had been made could be known.

5. *Evaluation*

   At this stage, the assessment of product performance can be tested whether the product is feasible or not. At this evaluation stage, the aim is to evaluate the product to see the quality of the product developed.

This research was conducted in the even semester of the 2024 academic year at the Faculty of Teacher Training and Education, Sultan Ageng Tirtayasa University in Serang City, Banten. Podcast media is limited to 30 Physics Education Students in the 2023 class

The research instruments used are material expert validation instruments, media expert validation instruments, and user assessment instruments with the following assessment aspects of each instrument:

Table 1. Material Expert Validation Instrument

No	Assessment Aspects	Assessment Scale				
		1	2	3	4	5
1.	The material is in accordance with the purpose of creating Podcast Media					
2.	Learning through podcast media can lead students to understand the history of physics figures					
3.	The use of podcast media in delivering material related to the historical role of physics figures can motivate learning					
4.	The content of the material in the podcast is according to the title of the discussion					

5.	The material is delivered in sequence in each episode					
6.	Podcast media is useful in the development of innovative learning methods					
7.	Podcast media piques consumer interest to use					

Table 2. Media Expert Validation Instrument

No	Assessment Aspects	Assessment Scale				
		1	2	3	4	5
1.	Media cover display					
2.	Media can be accessed anywhere and anytime					
3.	The voice on the podcast medium is clearly heard					
4.	Podcast media can provide effectiveness for users					
5.	The language used is easy to understand					
6.	Sentences used in explaining simple (straightforward) material					
7.	Presentation of material through communicative and interactive podcast media					

Table 3. User Assessment Instruments

No	Assessment Aspects	Assessment Scale				
		1	2	3	4	5
1.	Media cover display					
2.	Media can be accessed anywhere and anytime					
3.	The voice on the podcast medium is clearly heard					
4.	Podcast media can provide effectiveness for users					
5.	The language used is easy to understand					
6.	Sentences used in explaining simple (straightforward) material					
7.	Presentation of material through communicative and interactive podcast media					
8.	The material is in accordance with the purpose of creating Podcast Media					
9.	Learning through podcast media can lead students to understand the history of physics figures					
10.	The use of podcast media in delivering material related to the historical role of physics figures can motivate learning					
11.	The content of the material in the podcast is according to the title of the discussion					
12.	The material is delivered in sequence in each episode					
13.	Podcast media is useful in the development of innovative learning methods					
14.	Podcast media piques consumer interest to use					

With the data analysis used, namely using the Likert Scale, it is generally used to measure

attitudes which generally use five assessment numbers. (Sugiyono 2011, p. 134). The total assessment score can be calculated using the following formula:

$$NP = \frac{the\ number\ of\ results\ scored\ in\ each\ aspect\ (n)}{Ideal\ Maximum\ Score\ (N)}\ x\ 100\%$$

Keterangan:

NP = Eligibility Percentage
n = The number of results scored in each aspect
N = Ideal Maximum Score
100 = Fixed number

Table 4. Interpretation of Likert scale values

Skala	Tingkat Pencapaian	Interpretasi
5	81% - 100%	Sangat Baik
4	61% - 80%	Baik
3	41% - 60%	Cukup
2	21% - 40%	Kurang
1	0% - 20%	Sangat Kurang

RESULTS AND DISCUSSION

As a result of media development, the feasibility of a limited trial of the SeToFi Podcast (History of Physics Figures) as a supplement to the Basic Physics Course, namely in the form of audio recordings uploaded on the online platform (Spotify). The SeToFi Podcast (History of Physics Figures) is intended to provide supplements or additional information for students of Physics Education, Faculty of Teacher Training and Education, Sultan Ageng Tirtayasa University.

After an assessment of the SeToFi (History of Physics Figures) podcast media that was developed, it can be seen based on the perspective of material experts, media experts and also user assessments with the aspects that have been presented, it is said that the SeToFi (History of Physics Figures) podcast media is very good according to the interpretation of the media feasibility category. The description of the research results is as follows:

1. The assessment of the material on the SeToFi (History of Physics Figures) podcast media with material aspects in accordance with the purpose of making podcast media has a percentage value of 100%; The learning aspect through podcast media directs students to understand the history of physics figures has a percentage value of 100%; The aspect of using podcast media in delivering material related to the historical role of physics figures can motivate learning has a percentage value of 80%; the aspect of the content of the material in the podcast according to the title of the discussion has a percentage value of 100%; the material aspect is presented in sequence in each episode has a percentage value of 80%; The podcast media aspect is useful in the

development of innovative learning methods with a percentage value of 100%; The media aspect of podcasts that attract users to use has a percentage value of 100%. Based on 7 aspects of material expert assessment, it can be concluded that the SeToFi (History of Physics Figures) podcast media from Kelvin to Schrödinger obtained a percentage of 94.29% which can be categorized as very good. The results of the validation of the material experts on the SeToFi (History of Physics Figures) podcast media from Kelvin to Schrödinger can be seen in the image below:

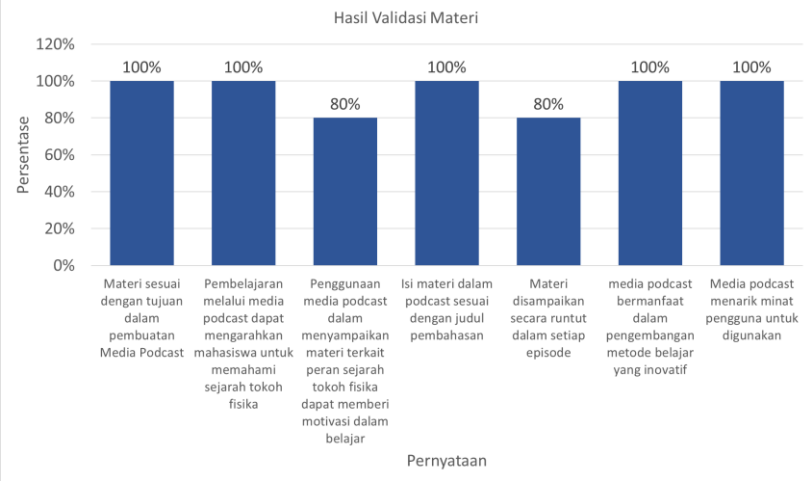

Figure 1. The results of the validation data of material experts

2. The media assessment of the SeToFi Podcast (History of Physics Figures) media with the aspect of the cover display has a percentage value of 80%; The podcast media aspect that can be accessed anywhere and anytime has a 100% percentage; the sound aspect of podcast media has a percentage of 100%; The media aspect of podcasts can provide effectiveness for users has a 100% percentage; the language aspect used is easy to understand has a percentage of 80%; the aspect of sentences used in explaining straightforward material has a percentage of 100%; The aspect of delivering material through communicative and interactive podcast media has a percentage of 100%. Based on 7 aspects of media expert research, it can be concluded that the SeToFi (History of Physics Figures) podcast from Kelvin to Schrödinger as a supplement to the basic physics course obtained a percentage of 94.29% with the very good category. The results of the assessment of media experts can be seen in the image below:

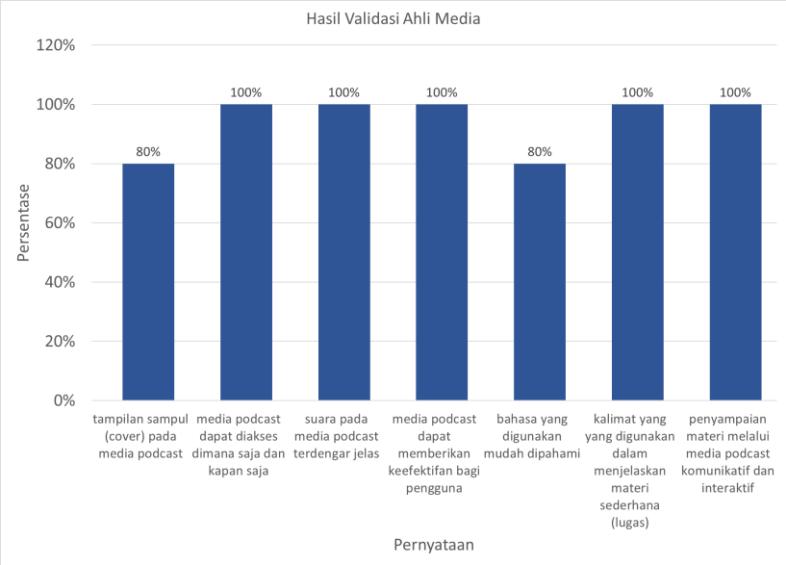

Figure 2. Results of media expert validation data

3. Based on the results of user evaluation of the SeToFi (History of Physics Figures) podcast media with the aspect of the cover display of the media has a percentage value of 84.67%; the media aspect that can be accessed anywhere and anytime has a percentage value of 88.67%; the aspect of votes in the media clearly has a percentage value of 82.67%; the aspect of effectiveness in the use of media has a percentage value of 84.67%; the aspect of the language used is easy to understand has a percentage value of 84.67%; the aspect of sentences used is simple (straightforward) has a percentage value of 82%; the aspect of delivering communicative and interactive material has a percentage value of 86%; the material aspect in accordance with the purpose of making media has a percentage value of 88%; The aspect of using media can provide direction to understand the historical material of physics figures has a percentage value of 85.33%; the aspect of media use that can provide motivation in learning has a percentage value of 89.33%; the aspect of the content of the material according to the title of the discussion has a percentage value of 86%; the material aspect that is delivered sequentially in each episode has a percentage value of 84.67%; the aspect of having benefits in the development of innovative learning media has a percentage value of 86.67%; and the aspect of media attracting interest to use has a percentage value of 83.33%. Based on 14 aspects of user surveys, it can be concluded that the SeToFi (History of Physics Figures) podcast from Kelvin to Schrödinger as a supplement to basic physics courses obtained a percentage of 85.48% with the category of very good. The results of the assessment of media experts can be seen in the image below:

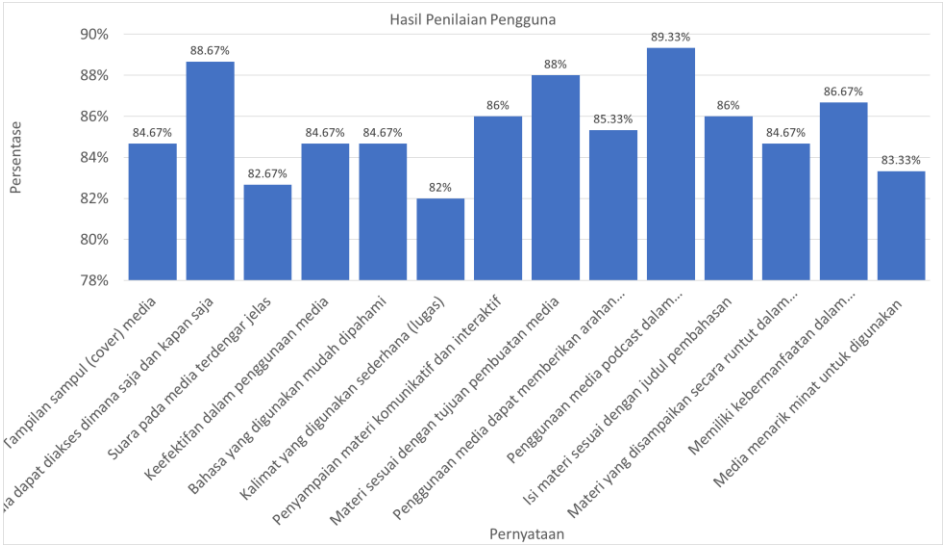

Figure 3. User rating data results

Previous research that is relevant to the learning media that the researcher uses about podcasts, namely by:

1. Research by (Tiara, 2019) entitled "Podcast as a Learning Media in the Millennial Era" The results of the study show the possibility of an increase from the medium category (59.4) to the good category (68.60). Podcast media is considered effective in improving learning outcomes.
2. Research (Adhitya Rol Asmi, 2019) on " Development of Podcast-Based Audio Learning Media on Local History Materials in South Sumatra " with the results obtained increased by 45.9% which was in the high category. This shows that podcast-based audio media that has been used is effective and has credibility.
3. The research (Hutabarat, 2020) entitled " Development of Podcast as a Digital-Based Learning Supplement Media in Higher Education " Based on the exposure to previous research and best practices that have been carried out by a number of universities, it can be concluded that in addition to face-to-face lectures in class and reading textbooks, podcasts are useful as a learning supplement media for students. So that students can better understand concepts, theories and applications that may not be available during the class. In addition, podcasts can be an alternative medium for distance learning.

Based on existing research, it shows that podcasts in learning can improve learning skills and can also be used as a learning supplement. However, the use of podcast media has not been developed towards the history of physics figures as a supplement to basic physics courses. Therefore, the SeToFi Podcast (History of Physics Figures) was developed to help students, especially in learning Basic Physics courses.

CONCLUSION

Based on the results obtained from the validation of the material on the SeToFi podcast (History of Physics Figures), an average percentage result of 94.29% was obtained with the category of very good. Then the results obtained from media validation of the SeToFi podcast

media (History of Physics Figures) obtained an average percentage result of 94.29% with the very good category. The results of user assessment were obtained with an average percentage result of 85.48% with the category of very good. Based on the data obtained, it has an average percentage value of 91.35%, therefore, the SeToFi (History of Physics Figures) podcast that has been developed by researchers is categorized as very feasible as a supplement to basic physics courses.

The suggestion recommended by the author is that the SeToFi podcast media (History of Physics Figures) can be further developed about other physicists, because there are still many other physicists who have not yet been found in this SeToFi (History of Physics Figures) podcast.

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