JBER 3 (2) (2022) 72 – 81

Journal Of Biology Education Research (JBER)

https://journal.unpak.ac.id/index.php/jber

Development of Electronic Pocket Books for ImmuneSystem Material to Increase Students Learning Motivation

Dapit Amriko [1*], Eka Suhardi, Rifki Risma Munandar
[1]Pendidikan Biologi, Universitas Pakuan, Bogor, Indonesia

Email: dapitsiregar16@gmail.com*

Received: 27 September 2022, Revised: 28 Oktober 2022, Accepted: 5 November 2022

Abstract

The teaching and learning process certainly requires interesting media and does not tend to beboring. Forthis reason, it is necessary to use media that can attract students' interest by using electronic pocket book media. This study aims to determine the quality of electronic pocket booksand determine the effectiveness of electronic pocket book media. This development research uses the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model. The analysis stage is an analysis of the needs of students. The design stage is the making of an electronic pocket book media design. The Development stageis an assessment of the feasibility of experts, namely material experts, media experts and teachers at SMA PGRI 1 Bogor. The Implementation stage is an assessment of the feasibility of the mediaand the Evaluation stage is a measurement of development achievement. The results showed the feasibility level of electronic pocketbook media, according to material experts, electronic pocketbooks were included in the appropriate category, while according to high school biology teachers and students, electronic pocketbooks were included in the very feasible category. The results of the analysis of student learning motivation before and after using the media were obtained, this showed a significant difference between before and after using the media, so it can be concluded that the electronic pocket book learning media can increase students' learning motivation.

Keywords: electronic pocket book; immune system; learning motivation

INTRODUCTION

Every human being experiences an educational process. Because education cannot be separated from human life. Education is a conscious and planned effort to create a learning atmosphere and learning process for students. Education is inseparable from the activities of the teaching and learning process. The teaching and learning process is the process of conveying messages through certain media or teaching materials to the recipient of the message. Teachers play a role as teaching staff in schools, of course, they need to manage information well so that it can be clearly accepted by students (Nurrita, 2018). This information can be conveyed by using appropriate, interesting, and arousing students' interest in learning. In teaching and learning activities, a media is needed to help the teacher's performance in conveying the material so that it can be well received by students (Nugroho & Ditto, 2016). Currently, there are many learning media that can be used by teachers, but the use of media must be in accordance with the situation and conditions of the learning environment at school. Learning media is anything that can convey and distribute messages from sources in a planned manner, so that a conducive learning environment occurs where the recipient can carry out the learning process effectively and efficiently (Tomita, 2018).

Biology is the science of living things that focuses on the study of science about living thingsand their lives. One of the materials considered difficult in biology lessons is the material on the Immune System. The immune system is considered difficult because this material discusses the body's defense system in dealing with a type of disease. Explanations about the components of the immune system and the body's defense mechanisms tend to be abstract, making it difficult for students to understand. For this reason, it is necessary to have learning media that can attract students' interest in immune system material. Biology learning about the immune system certainly cannot be separated from the use of learning media. In teaching and learning activities, teachers find it difficult to design learning strategies because the learning timefor immune system material is too short. The strategies used by teachers in learning activities tend to use the lecture method or conventional methods by using presentation slides. Learning strategies used by teachers can affect the competence nd motivation of students (Ahn, *et al*., 2021). The conventional method is teacher centered learning, in which the teachers narrative and axplanations are carried out orally (Harsono, 2009).

Learning media is a tool that can be used to channel the sender's message to the recipient, sothat it can stimulate the thoughts, feelings, concerns, and interests of students to learn (Tafonao, 2018). The tools used are electronic or non-electronic. Modern electronic tools that can be used for learning media are smartphones and computers. Most students certainly already have smartphones and computers, this can be used by teachers to support learning activities by utilizingelectronic goods as learning media. The existence of electronic-based learning media can make it easier for teachers to deliver learning materials in the distance learning process or online learningprocess. A pocket book in digital form that contains information that has a coherent presentation format, good language, high scientific content, and has extensive discussion, using an electronic pocket book students have easy access to book, save paper, and can be opened anywhere and anytime (Hardiansyah *et al*., 2022). Electronic books or digital books are known aselectronic versions of a book. This book is nothing but a formof book that can be opened electronically via a computer.

Based on the percentage of data obtained from the questionnaire for class XII MIPA 3 students at SMA PGRI 1 Bogor, that the biological material considered difficult by students was the immune system material which got the top rank, reaching 53.3%. , then 29.7% on the Coordination system material, 11% on the excretory system and 6.6%on the Respiratory System material. From the results of interviews with class XII students in February 2020 at SMA PGRI 1Bogor when during the teaching and learning process there were still students who were not serious, then the learning media used were less varied. The books used by students only used package books that were lent to each class XII MIPA student at SMA PGRI 1 Bogor and the LKS provided by the teacher was still less attractive. So that these students tend to be bored and not seriously participate in teaching and learning activities and motivation to learn is still low.

According to Kuswanto & Ferri, (2018) the use of learning media greatly affects students' learningmotivation, this is because the learning process becomes more interesting. Motivation is an internal psychological factor in each individual (Brody *et al*., 2020). Learning motivations to support better learning activities so that it makes it easier for students to understand the material and achieve the desired goals (Zhang, 2022). Learning motivation can be influenced by variousfactors, namely internal and external factors. Internal factors are factors that come from oneself such as the willingness to learn, while external factors are factors from the surrounding environment such as learning media, learning methods, and learning infrastructure. Students' low motivation to learn is caused by the absence of a complete biology textbook. According to Mudjiono (2002) learning motivation is very important for students to be appliedin the learning process and student learning activities in the classroom. The criteria for the importance of learning motivation are (1) awareness of the position at the beginning of learning, the process andfinal results, (2) informing about the strength of the learning effort, (3) directing learning activities, (4) raising the spirit of learning, (5) making awareness about the journey continuous learning and then working.

The success of learning is marked by the acquisition of knowledge, skills, and positive attitudesin students, in accordance with the expected goals. The success of learning is strongly influenced by many factors, one of wich is the use of learning media by using learning media the complexity of learning can be simplified (Fernandes & Rahma, 2021). Based on the interview with the biology teacher of class XI SMA PGRI 1 Bogor, it is known that the material on the immune system is a material that is difficult for students to master. The difficulties experienced by students are because the material being studied tends to be abstract anddifficult toimagine, especially in the working

mechanism of the immune system. Problems relatedto learningthe immune system include strategies and learning media. Teachers find it difficult to design learning strategies due to the short learning time of the immune system material. The learning strategy used by the teacher is the lecture method. The media that is often used by teachersis only inthe form of power points which are not suitable for understanding students regarding theabstract immune system in a short time.

Based on the results of the questionnaire obtained from a class XII student at SMA 1 PGRI Bogor, it turns out that the media used in the school is less varied, so it is necessary to develop a learning media that supports and is in accordance with the characteristics of students, one of whichis to make learning media based on an android pocket book, namely a pocket book dominated by pictures, practice questions in the form of word squares, and crossword puzzles in the form of an application that is run through a smartphone then the android book must be dominated by attractivecolors for students so that students do not tend to be bored and can be interested in reading it and easy to understand. application that is run through a smartphone then the android book must be dominated by attractive colors for students so that students do not tend to be bored and can be interested in reading it and easy to understand. One of the student learning media that implementsthe development of technology and communication with user interaction that is currently being developed is a digital book (Berglund, 2021). Electronic books are known as the evolution of printed books that we usually read in everyday life. (Baker, 2012).

METHOD

This research was conducted at SMA PGRI 1 Bogor, having its address at Jl Bina Marga I No. 17, Baranang Siang kec. East Bogor, Bogor City, West Java 16143. Thisresearch method is Research and Development. The research model used is ADDIE (Analyze, design, development, implementation, evaluation). At this stage, the main activity is to analyze the need to develop new media/models/learning methods and analyze the feasibility and requirements of media development. Analysis is the first stage to be carried out by someone developing learning. There are several segments that must be analyzed, namely students, learning, and media to deliver teaching materials. The steps in this analysis stage are at least: analyzing students; determine teachingmaterials; determine competency standards to be achieved; and determine the media to beused.

The design stage aims to design a pocket book. The immune system electronic pocket book is designed in full color consisting of an introduction, character introduction, basic competence, indicators, learning objectives, plot, presentation of material, questions, bibliography, and author's autobiography. This immune system electronic pocket book is also equipped with pictures and videos to motivate students. The electronic pocket book was developed through an android-based book that can be installed on smarttrees which contains easy-to-understand learning materials and a summary of the material adjusted to the level of readability or understanding of high school students in class XI Mipa. Aspects in writing a summary are made in simple steps to help students understand the content of the material in the electronic pocket book.

Development in the ADDIE model contains the realization of product design activities. In the design stage, a conceptual framework for the application of new media/models/learning methods has been developed. In the development stage, the conceptual framework is realized intoa product that is ready to be implemented. In carryingout the development steps, there are twoimportant goals that need to be achieved,including: Producing or revising pocket book media that will be used to achieve previously formulated learning objectives. And Choose the best media communication media that will be used to achieve learning objectives. This stage will implement the media design that has been developed in real situations in the classroom. Implementation is a real step to implement the learning system that we are making. That is, at this stage everything that has been developed is installed or set in such a way according to its roleor function so that it can be implemented. Products that have passed expert validation will be implemented in the learning process as teaching materials that will be used to be tested on students. Field trials will be limited to a numberof students studying the immune system.

At this stage the product will be tested on 30 students of class XI MIPA SMA PGRI 1 Bogor. Before being tested at this stage, questionnaires were distributed to measure anddeterminestudent responses regarding the pocket book learning media for learning the biology of the immune system as well as a learning motivation questionnaire. If necessary, revisions will be made based on input and suggestions from students. However, in this revision, inputs and suggestions from previous validators

will be considered so that they do not conflict with previousimprovements. Evaluation is the last step of the ADDIE learning system model. Evaluation is a process carried out to provide value to learning media. Evaluation of the learning programaims tofind out several things, namely: Students' attitudes towards learning activities using pocket book media as a whole. Increased competence in students, which is the impact of participation in learning withpocket book media. The benefits that are felt by the school due to the increase in student competence havetaken part in learning with pocket books. Learning media is validated as a consideration in revising the learning media that has been developed to produce a valid final product. Learning media is validated by media experts, high school biology teachers, and high school students. The instrument used is a questionnaire consisting of three aspects, namely the content of the material, presentation, font, graphic and linguistic. In addition, there is a questionnaire to measure students' learning motivation. The questionnaire was distributed through online media, Google forms. Based on the results of the questionnaire, it will be processed using a Likert scale. Furthermore, the t-test with the paired sample formula was also carried out.

RESULT AND DISCUSSION

The electronic pocket book to be tested is validated first by the experts. Results ofvalidation test by material experts can be seen in table 1.

Table 1. Material Expert Validation Results

Content	Score	Linguistic	Score
Conformity with basic competencies and learning indicators	4	Rules of grammar, spelling, terms and symbols	4
Determination of material assesment	3	Clarity of use of words and language	4
Material usability	3	The suitability of the use of sentences	4
Concept accuracy	3	Ease of sentence to understand	3
Clarity of material	3		
Explanation of examples	2		
Coverage of material	4		
Systematiclogical presentation	3		
Total	25	Total	15
Average	3.12	Average	3.75
Category	Decent enough	Category	Worthy

Based on the table regarding the conversion of Quantitative Data scores to Qualitative data, it is known that the average score (X) 3.4 lies in the range of X < 3.8 which means that the developedmedia gets a "B" score with the "Eligible" category. The results of the validation by material experts show the results of the electronic pocket book assessment. The total value obtained from the content aspect is 25 out of 8 statement items. The total value obtained from the language aspectis 15 out of 4 statement items. Each statement has a rating scale of 1-5. Based on the assessment of the aspects of content feasibility and linguistic feasibility, it is feasible to be tested according to the validation results from material experts.

Table 2. The results of the Media Expert Validation

Presentation	Score	Graph	Score
Presentation of material systematically and logically	4	Electronic pocket book size	4
Sequential presentation of concepts	4	Determination of the proportion of images and symbols in the text	4
Ability to stimulate motivation	4	Readibility of writing sentences	4
Image presentation	4	Color selection	4
Explanation of examples	3	Font selection	4
		Color compatibility of writing with background	4
		Electronic pocket book cover	4
Total	19	Total	28
Average	3.8	Average	4
Category	Worthy	Category	Worthy

Based on the recapitulation of the assessment, the assessor of Media Expert I is "B" withthe category "Eligible" according to table 20, namely the average (X) 3.9 lies in class 3.4 < X 4.2.Based on table 12 regarding the conversion of Quantitative Data scores to Qualitative data, it is known that the average score (X) 3.4 lies in the range of X < 3.8 which means that the developed media gets a "B" score with the "Eligible" category. The results of the validation by media expertsshow the results of the electronic pocket book assessment. The total value obtained from the presentation aspect is 19 out of 5 items statement. The total value obtained from the graphic aspectis 28 out of 7 statement items. Each statement has a rating scale of 1-5. Based on the assessment of the aspects of content feasibility and linguistic feasibility, it is feasible to be tested according to the validation results from material experts. One of the validators of learning practitioners for the developed electronic pocket book is aBiology teacher at SMA PGRI 1 Bogor, Ibu Asih. Validation is carried out related to all aspects, namely aspects of content, language, presentation, and graphics of the developed electronic pocketbook.

Table 3. High school biology teacher validation results

Eligibility Aspect	Total Value	Average	Category
Presentation	58	4.8	Very Worthy
Graph	37	4.6	Very Worthy
Language	23	4.6	Very Worthy
Total	118	4.6	

Based on the assessment of the Biology Teacher of SMA PGRI 1 Bogor, from the aspect of presentation, language and graphics, the electronic pocket book developed got an "A" score, which was included in the "Very Eligible" category. The score (X) is 4.6, which lies in the rangeX > 4.2. according to the results of the recapitulation of the assessment validation of SMA PGRI1 Bogor High School teachers, it shows that the electronic pocket book developed is very feasible to use.

Table 4. Student's Electronic Pocket Book Assessment Results

Eligibility aspect	Total value	Average	Category
Content	35	4.3	Very Worthy
Language	16	4	Worthy
Presentation	19	4.7	Very Worthy
Graph	38	4.2	Worthy
Total	108	4.3	Very Worthy

Based on the student's assessment of the electronic pocket book, it shows that the electronic

pocket book developed based on aspects of content, language, presentation, and graphics is very feasible to use.

Table 5. Recapitulation of Learning Motivation Questionnaire Results

Indicator	Before		After		Enhancement (%)
	Total	Score (%)	Total	Score (%)	
Having desire to read book	77	58	89	63.6	5.6
Having desire to ask teacher	57	33	82	41.7	8.7
Having desire to relearn the material of immune system	81	33.3	82	41.7	8.4
Having desire to master the material	70	41.7	82	50	8.3
Having desire to get a score above KKM	90	85.3	91	91.7	6.4
Uninteresnt in reading book	77	41.3	79	58	16.7
Having desire to ask and answer in learning activity	36	58.3	37	65.7	7.4

The first stage carried out in this model is the analysis stage. This analysis stage is carriedout by analyzing the school curriculum, syllabus, learning media and models and methods used in schools. The result of the observation is that the teacher uses the textbook for class XI to teach the material on the Immune System. Students are less enthusiastic in participating in learning. This is in accordance with the theory according to Muslich (2010) that teaching media dominated by writing can give students a saturation effect because the presentation of subject matter is too muchdominatedby writing so that it tends to turn off interest and cause boredom to students. Therefore,it is necessaryto develop learning media. based on student characteristics.

The next stage is task analysis, the goal is to find out what the learning process is often donein schools when the learning process is like. It was found that the learning process in the classroomon biology learning and also from the results of interviews with biology teachers that classroom learning still uses the lecture method. Of course, it will be difficult for students to learn biology lessons. This is in line with research conducted by Susanto (2016) that learning using learning media will be more active than conventional learning methods or using the lecture method. Based on the results of interviews with several students of class XI Mipa 2 that conventional learning or learning with the lecture method can make us bored and boring this is because students just stay silent and listen to the teacher explain the lesson that is being conveyed to students. Of course, this learning is still using the lecture method.

Figure 1. Electronic pocket book menu display

Figure 2. Electronic pocket book front cover

An electronic pocket book is a form of book that can be opened electronically via a computer, laptop or smartphone. Electronic pocket books can be used as publications consisting of text, images and sound and published in digital form that can be read on computers or other electronic devices. Andikaningrum *et al*. (2011) that the electronic pocket book is an electronic version of the book. If the book generally consists of a collection of paper containing text or images, electronicbooks provide digital information which can also be in the form of text or images. This is also reinforced by Putera (2011) which states that electronic pocket books are books that are small in size compared to conventional books and have interesting contentand the advantages are that they are easy to carry and do not requirelarge storage space. Electronicpocket books can be stored on PCs (Personal Computers), laptops and smartphones.

After knowing the problems faced, the researcher consulted with the teacher concerned about what basic competencies would be taken as material for the electronic pocket book. Making this electronic pocket book refers to the curriculum that applies in schools, namely the education unit level curriculum as a media to support learning.

The next stage is the design stage. At this stage is the stage of designing the media to be developed. The researcher designed an electronic pocket book which includes designing the overall media design in the form of storyboards, compiling materials, making images for the background, fonts, icons that will be included in the media application. At the development stage, it is the process of making media that is carried out to completion. The initial stage of development is compiling and making a Splash Screen that lasts 3 seconds and will appear when the applicationstarts to run as an introduction to where this application comes from by displaying the logo only. Next, make the start of the start page function as a splash screen stop point and also an applicationstartup page that shows the name of the application. To continue to the next section, the user mustfirst touch the screen. After the start page is complete then arrange the menu page and other pages. After everything is compiled, then coding is done so that the system can run well and continuously.

The electronic pocket book contains components in it, namely there is a front page as the main cover, then an introduction, competence and learning objectives, a list of materials, and a researcher profile. The material list section contains sub-materials that will be studied and understood by students. In the electronic pocket book, the emphasis is on various color variations, interesting pictures and background, this is developed so that students do not feel bored with the appearance of the electronic pocket book and easily understand the contents of the electronic pocket book. This is in line with the research of Prastowo (2011) that the provision or use of images in learning media will increase the attractiveness of students in learning and can eliminate boredom when studying the material. In addition Baylen (2021) states that the use of visual media in the form of images can facilitate the delivery of material to students. The next stage is the development stage. At this stage, the electronic pocket book that has been designed is then produced to be validated by material experts and media experts. This validation activity aims to assess the feasibility of an android-based pocket book that was developed according to the input given by the experts. The validators in this study were a lecturerin the Biology department of Pakuan University as a material expert, a lecturer in the Biology department of Pakuan University as a media expert, and a Biology teacher at SMA PGRI 1 Bogor. The electronic pocket book that was tested on field subjects is the result of revisions from the validators so that the electronic pocket book media is worthy of being tested to find out the advantages and disadvantages

of the electronic book media from potential users.

The electronic pocket book was implemented in class XI MIPA 2 SMA PGRI 1 Bogor. Field trialswere conducted on 12 students. Students look very enthusiastic when learning Biology material on the Immune System. They are very happy to read electronic pocket books and understand them because the books have attractive colors, easy-to-understand sentences and pictures that make students not bored to read them. The electronic pocket book was developed through an android- based book that can be installed on smarttrees which contains easy-to-understand learning materials and a summary of thematerial adjusted to the level of readability or understanding of high school students in class XI Mipa. Aspects in writing a summary are made in simple steps to help students understand the content of the material in the electronic pocket book. The main objective of developing the Immune System material electronic pocket book is to increase students' learning motivation. Researchers know to increase student motivation by using a questionnaire before and after using the electronic Pocket Book media. At the evaluation stage, the researcher calculated the results of the motivational questionnaire by interpreting each indicator associated with the results of the media feasibility questionnaire assessment of the field trial students.

Eligibility of Media The developed electronic pocket book can be identified through validation from experts. Collecting media feasibility data using a 1-5 scale questionnaire. The overall result of the expert's validation was a score of 3.9 which was included in the feasible category. The material expert in this study is a lecturer from the Department of Biology Education, Pakuan University. Material experts assess the media in terms of material, namely according to aspects of content feasibility and linguistic feasibility. Researchers make revisions in accordance with the advice from material experts. The feasibility of the contents of the electronic pocket book is reviewed from 8 questions, which are the aspect with the highest average score compared to other aspects, namely the linguistic aspect in the feasibility of the material. Feasibility of content obtained an average of 3.1 which is included in the category of Fairly decent. The linguistic eligibility in the electronic pocket book of 4 questions obtained an average score of 3.7 which wasincluded in the "Eligible" category.

The average question item gets the same value, namely on a value scale of 4. In this aspect, the material expert does not provide comments/suggestions regarding the indicators given because they are considered appropriate or appropriate if judged from the linguistic aspect. Based on the assessment of the material expert, the electronic pocket book obtained an average score of 3.4 which is included in the "Eligible" category, thus the electronic pocket book material on the Immune System is suitable for use as a medium of learningin schools.

Media expert I in this study is one of the lecturers of Biology Education, Pakuan University.The validation results are used for media assessment which consists of 2 aspects, namely the presentation aspect and the graphic aspect. Researchers make revisions in accordance with the provision of suggestions. The feasibility of presenting the electronic pocket book consists of 5 questions that get an average score of 4.0 which is included in the "Eligible" category. Overall, each question indicator item gets a score of 4 which is categorized as "Good". The feasibility of the graphic consists of 7 questions with an average score of 3.8 which is included in the "adequate" category. According to comments from media experts, overall, from a linguistic point of view, theelectronic pocket book that was developed did not make any revisions. Based on the assessment of media experts on both aspects of the media, namely the presentation and graphic aspects, the electronic pocket book developed obtained an average score of 3.9 which is included in the "decent" category.

Media expert II in this study is one of the lecturers of Biology Education, Pakuan University.The validation results are used for media assessment which consists of 2 aspects, namely the presentation aspect and the graphic aspect. Researchers make revisions in accordance with the provision of suggestions. Feasibility of presentation The electronic pocket book consists of 5 questions that get an average score of 3.2 which is included in the "Eligible" category. Overall, each question indicator item gets a score of 4 which is categorized as "Good". The feasibility of the graphic consists of 7 questions with an average score of 3.8 which is included in the "adequate" category. According to comments from media experts, overall, from a linguistic point of view, theelectronic pocket book that was developed did not make any revisions. Based on the assessment of media experts on both aspects of the media, namely the presentation and graphic aspects, the developed electronic pocket book obtained an average score of 3.8 which is included in the "decent" category.

Based on the assessment of high school teachers, overall the developed electronic pocket book media obtained an average score of 4.6 which was included in the "Very Eligible" category. Thus, the

electronic pocket book material on the Immune System is appropriate to be used as a medium for student learning in high school. Increased motivation after using electronic pocketbook media. The first indicator, namely "there is a desire to read books", is shown enthusiastically by students who are motivated to read electronic pocket books. This is in accordance with the aspect of presenting the content of the material in the electronic pocket book, where students give a B or proper rating. Students also do not hesitate to ask questions about the material on the Immune System which they feel they still do not understand. This question item is in accordance with the feasibility aspect of the book content which is said to be feasible on the indicator. “Clarity of basic competencies and indicators” where students give an “Eligible” assessment.

In the second and third indicators "there is a passion for learning" and "there is a desire to relearn the material on the immune system", students show an increase in motivation seen from the statement that they study the material that has been given and study again if there is homework,or dailytests. This is supported by the aspect of the feasibility of the contents of the book which received an "Eligible" assessment. The fourth indicator is "The ability to do practice questions", students showan increase in motivation seen from the statement that they have the ability to work on practice questions given by the teacher when in online learning activities. The fifth indicator “There is a desire to get value”. This is indicated by the statement that students have a target to get a score abovethe KKM and provide motivation and appreciation from the people around them, both teachers, parents, and friends. The electronic pocket book has an indicator of "Ability to motivate students" on the aspect of presentation feasibility which gets an "Eligible" assessment by students. The sixth indicator "There is interest in studying the biology of the immune system". This is related to the indicators contained in the aspect of the feasibility of the contents of the electronic pocket book. "Relationships with Biology learning activities on Immune System materials" received an "Eligible" assessment by students. The last indicator "there is a desire to ask and answer in the learning process activities". Students become happy to learn and enthusiastic in participating in the learning process.

This canbe seen when some students ask and answer questions about the Immune System material during the online teaching and learning process. With the electronic pocket book, it is easier for students to ask and answer questions during the online learning process (LeDell *et al.*, 2012; & Koomson *et al.*, 2021).

CONCLUSION

Based on research on the development of electronic pocket books, it can be concluded that the validation of material experts gets an average of 3.4 with a decent category. Media experts I and II got an average score of 3.8 and 3.9 with a decent category. The validation expert from the high school biology teacher got an average score of 4.6 with a very decent category. The questionnaire obtained that electronic pocket books are very effective in increasing students' learning motivation. This can be seen from the results of the increase beforeand after using the electronic pocket book, an N-gain score of 0.7 with a moderate category.

REFERENCES

Ahn, I., Chiu, M. M., & Patrick, H. (2021). Connecting teacher and student motivation: Student-perceived teacher need-supportive practices and student need satisfaction. Contemporary Educational Psychology, 64(10), 101950. Doi: 10.1016/j.cedpsych.2021.101950

Baylen, D.M., Hokanson, B. (2021). Starting Conversations on Visual Media and GlobalLearning. *TechTrends* 65, 831–832. Doi: 10.1007/s11528-021-00655-z.

Berglund, K. (2021). Introducing the Beststreamer: Mapping Nuances in Digital Book Consumptionat Scale. *Pub Res Q* 37, 135–151. Doi: 10.1007/s12109-021-09801-0.

Brody, D. L., Scheiner, E. Y., Dimri Ben Ari, M., Tzadok, Y., van der Aalsvoort, G. M., & Lepola, J. (2020). Measuring motivation in preschool children: A comparison of Israeli, Dutch and Finnish children. Early Child Development and Care, 190(2), 150–160. Doi: 10.1080/03004430.2018.1459593

Fernandes, Reno & Rahma Violla. (2021). Efektivitas Media Pembelajaran E-Booklet Dalam Pembelajaran Untuk Meningkatkan Hasil Belajar Siswa Pada Mata Pelajaran Sosiologi. Jurnal SIKOLA. 3(1). 13-23. Doi: 10.24036/sikola.v3i1.144

Hardiansyah, Noorhidayat, & Novita Anggriani Yusuf. (2022). Validitas Dan Keterbacaan Buku Saku Elektronik Di SMA Tentang Pteridophyta Di Bantaran Sungai Irigasi Rawa Desa Tanipah Kecamatan Mandastana. JUPEIS: Jurnal Pendidikan dan Ilmu social. 1(2). 81-92.

Harsono, Beni, Samsudi, & Soesanto. (2009). Perbedaan Hasil Belajar Antara Metode Ceramah Konvensional Dengan Ceramah Berbantuan Media Animasi Pada Pembelajaran Kompetensi Perakitan Dan Pemasangan Sistem Rem. Jurnal PTM. 9(2). 71-79. Doi: 10.15294/jptm.v9i2.202

Koomson, I., Abdul-Mumuni, A. & Abbam, A. (2021). Effect of financial inclusion on out-of-pockethealth expenditure: empirics from Ghana. *Eur J Health Econ* 22, 1411–1425. https://doi.org/10.1007/s10198-021-01320-1.

Kuswanto, Joko & Ferri Radiansah. (2018). Media Pembelajaran Berbasis Android Pada Mata Pelajaran Sistem Operasi Jaringan Kelas XI. Jurnal Media Infotama. 14(1). 15-20. Doi: 10.37676/jmi.v14i1.467

LeDell, E., Prabhat, Zubarev, D.Y. *et al.* (2012). Classification of nodal pockets in many-electron wave functions via machine learning. *J Math Chem* 50, 2043–2050. Doi: 10.1007/s10910-012-0019-5

Mudjiono, (2002). *Belajar dan Pembelajaran.* Jakarta: Rineka Cipta dan Depdikbud.

Muslich, Mansur. (2010). *Text Book Writing*. Jakarta: Ar-Ruzz Media

Nugroho, Mahendra Adhi & Ditto Rahmawan Putra. (2016). Pengembangan Game Edukatif Berbasis Android Sebagai Media Pembelajaran Akuntansi Pada Materi Jurnal Penyesuaian Perusahan Jasa. Jurnal Pendidikan Akuntansi Indonesia. 14(1). 25-34. Doi: 10.21831/jpai.v14i1.11364

Prastowo, A. (2014), *Panduan Kreatif Membuat Bahan Ajar Inovatif Menciptakan Metode Pembelajaran yang Menarik dan Menyenangkan.* Yogyakarta: DivaPress.

Putera, P. (2011). *Ebook dan Pasar Perbukuan Kini*. Retrieved November 20, 2016,from lipi.go.id Sadiman S, dkk. (2011). *Media Pendidikan, Pengertian, Pengembangan dan Pemanfaatannya.* Jakarta: Rajawali pers

Susanto, A. (2016). *Teori Belajar dan Pembelajaran*. Jakarta: Prenada Media Group.

Tafonao, T. (2018). *Peranan Media Pembelajaran Dalam Meningkatkan The RoleOf InstructionalMedia To Improving.* 2(2)

Tomita, K. (2018). Author Correction: Does the Visual Appeal of Instructional Media Affect Learners' Motivation Toward Learning?. *TechTrends* 62, 113. Doi : 10.1007/s11528-017-0242-9.

Zhang, B. (2022). The relationship between Chinese EFL learners' resilience and academic motivation. Frontiers in Psychology, 13. Doi: 10.3389/ psyg.2022.871554