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DEVELOPMENT OF *DISCOVERY LEARNING - BASED E-BOOK TEACHING BASED ON KVISOFT FLIPBOOK MAKER* ON SCIENCE LITERATION IN MAN 2 PADANG PARIAM

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Abstract. This research is motivated by the outstanding printed books that do not display interactive simulations by combining text, images, audio, video, and animation so that they are less attractive, the availability of communicative science learning media and have many interesting displays that have not yet been developed, teaching materials used in Islamic schools in the form of printed-based teaching materials such as physics textbooks and the availability of instructional media less utilizing existing technology in the learning process and lack of reading skills, interest in reading and lack of understanding of scientific concepts of students as well as the lazy nature possessed by students. Test the effectiveness of *discovery learning based e-book* teaching materials *using Kvisoft Flipbook Maker* by looking at the scientific literacy of students using the effectiveness questionnaire sheets by class X-MIA MAN 2 students in Padang Pariaman. The results showed, obtained an average value of 88.49% categorized as very practical, while for the effectiveness of e-*book* learning materials *based on Discovery Learning assisted by Flipbook Maker* obtained an average value of 80.89% for the scientific literacy ability of students. The results can be concluded that the *e-book* teaching material *based on discovery learning assisted by Koftoft Flipbook maker* on material momentum, impulses, and simple harmonic vibrations is very valid, very practical, and effectively used in physics learning class X MIPA -1 MAN 2 Padang Pariaman.

Keywords: E-book, Teaching Material, Discovery Learning Model, Kvisoft Flipbook Maker, Science Literacy

Abstrak. Penelitian ini dilatarbelakangi oleh adanya buku cetak berprestasi yang tidak menampilkan simulasi interaktif dengan memadukan teks, gambar, audio, video dan animasi sehingga kurang menarik, ketersediaan media pembelajaran IPA komunikatif dan masih banyak tampilan menarik yang belum banyak ditampilkan. yang dikembangkan, bahan ajar yang digunakan di sekolah berupa bahan ajar berbasis cetak seperti buku teks fisika dan ketersediaan media pembelajaran kurang memanfaatkan teknologi yang ada dalam proses pembelajaran dan kurangnya keterampilan membaca,

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minat baca dan kurangnya pemahaman konsep ilmiah siswa serta sifat malas yang dimiliki siswa. Uji keefektifan bahan ajar e-book berbasis discovery learning menggunakan Kvisoft Flipbook Maker dengan melihat literasi sains siswa menggunakan lembar angket keefektifan siswa kelas X-MIA MAN 2 di Padang Pariaman. Hasil penelitian menunjukkan, diperoleh nilai rata-rata 88,49% berkategori sangat praktis, sedangkan untuk keefektifan materi pembelajaran e-book berbasis Discovery Learning berbantuan Flipbook Maker diperoleh nilai rata-rata kemampuan literasi sains siswa sebesar 80,89%. Hasil penelitian dapat disimpulkan bahwa bahan ajar e-book berbasis discovery learning berbantuan pembuat Flipbook Koftoft pada materi momentum, impuls dan getaran harmonik sederhana sangat valid, sangat praktis dan efektif digunakan pada pembelajaran fisika kelas X MIPA -1 MAN 2 Padang Pariaman.

Kata Kunci: E-book, Bahan Ajar, Model Pembelajaran Discovery, Pembuat Kvisoft Flipbook, Literasi Science.

Introduction

Technological developments that are growing rapidly also have an impact on the world of education, especially in the mindset of students who want to be fast in meeting their learning needs.[1] Physics is essentially a science that studies phenomena through a series of processes known as scientific processes that are built based on scientific attitudes and results manifested as scientific products that are composed of the three most important components of concepts, principles, and theories that apply universally.[2]

Along with the development of computer information technology (ICT) for the visualization of concepts in physics, learning materials has been done by adding images as we find them in textbooks or moving objects (animations) displayed on a computer. The use of computers not only helps show animation

[1] H. Kinshuk, & N. Chen, "Trends in Educational Technology through the Lens of the Highly Cited Articles Published in the Journal of Educational Technology and Society." *Kinshuk@athabascau.ca,* Vol. 6, No. *2*, (2013): 3–20.

[2] P. Aswirna, "Development of Physics Comics as a medium for learning physics in Class VIII MTSN 1 Lubuk Basung." Vol. *3* No. 1, (2017): 359–363.

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but is also used as a medium for presenting teaching materials such as books.[3] Learners do not just come, sit, listen to lecturers' lectures, and memorize the material provided by educators, but try to independently coordinate their knowledge.[4] Information and Communication Technology (ICT) based learning cannot be separated from the demands of 21st century learning.[5] The use of digital teaching materials in the learning process aims to create learning that is more meaningful and of quality and becomes interesting, effective, and innovative learning.[6] 21st century learning requires learners to become more independent in learning and growing customize to the era.[7] While looking at the presentation of instructional media e-books let nuanced ethnics obtained a value. [8] The learning process can take place effectively by providing opportunities for students to learn independently so that by conducting their learning activities students can gain knowledge from their understanding.[9] Besides teaching materials should be designed so that students can connect subject matter with daily life, especially in learning physics.[10]

According to De Graff, provides an opinion that:

[3] V. Khanchandani & M. Kumar, "Mapping of E-books in Science & Technology: An Analytical Study of the Directory of Open Access Books." *DESIDOC Journal of Library & Information Technology,* Vol. *37,* No. 3, (2017): 172–179.

[4] Zita Baužienė & V. Aldona, "Independent Learning with the Context of Higher Education. " *Journal of International Scientific Publications,* Vol. *12,* No. 1, (2014): 588-598.

[5] C. Kivunja, "Do You Want Your Students to Be Job-Ready with 21st Century Skills? Change Pedagogies: A Pedagogical Paradigm Shift from Vygotskyian Social Construction to Critical Thinking, Problem Solving and Siemens' Digital Connectivity." Vol. *3,* No. 3, (2014): 81–91.

[6] Kowitlawakul & Yanika, "Development of an E-Learning Research Module Using Multimedia Instruction Approach." *CIN: Computers, Informatics, Nursing.* Vol. *35,* No. 3, (2017): 158–168

[7] J. Hsu, H. Karin, & D. Sara, "Guided Independent Learning: A Teaching and Learning Approach for Adult Learners." *International Journal of Innovation and Learning.* Vol. *62,* No. 3, (2014): 367–384.

[8] Eleanor, "Practicality and Effectiveness of E-Books Based on LCDS To Foster Students "Structural Thinking Skills." Vol. *3,* No. 4, (2019): 86–90.

[9] C. Kivunja, "Do You Want Your Students to Be Job-Ready with 21st Century Skills? Change Pedagogies: A Pedagogical Paradigm Shift from Vygotskyian Social Construction to Critical Thinking, Problem Solving and Siemens' Digital Connectivity." Vol. *3,* No. 3, (2014): 81–91.

[10] K. Tharmar & R. Kalidasan. "The Impact of Self Study with And Without E-Learning Modules Among Physical Education Students." *International Journal of Environmental and Science Education.* Vol. *11,* No. 8, (2017).

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Scientific literacy in terms of and argued that an open-ended approach, free of texting, high testing, allowing students and students more freedom to choose from a wide variety of scientific content and methodologies.[11]

Science literacy must be built from the beginning of school because with scientific literacy abilities students have knowledge and understanding of science concepts and scientific processes that will enable students to make decisions with the knowledge they have.[12] Science literature describes a person's ability to understand laws, theories, phenomena, and scientific matters.[13] Development of scientific literacy of students includes knowledge about science, science processes, development of scientific attitudes, and students' understanding of science so that students not only know the concepts of science but can also apply the ability of science to solve various problems and can make decisions based on scientific considerations.[14] Scientific literacy represents the ability to use evidence and data to evaluate the quality of information and arguments presented by scientists and mass media.[15]

Talk about science and technology developed for the benefit of mankind. Supposedly Allah SWT has discussed in the Koran (QS: An Naml verse 125) where Allah SWT says:

قَالَ ٱلَّذِى عِندَهُۥ عِلۡمٞ مِّنَ ٱلۡكِتَٰبِ أَنَا۠ ءَاتِيكَ بِهِۦ قَبۡلَ أَن يَرۡتَدَّ إِلَيۡكَ طَرۡفُكَۚ فَلَمَّا رَءَاهُ مُسۡتَقِرًّا عِندَهُۥ قَالَ هَٰذَا مِن
فَضۡلِ رَبِّى لِيَبۡلُوَنِىٓ ءَأَشۡكُرُ أَمۡ أَكۡفُرُۖ وَمَن شَكَرَ فَإِنَّمَا يَشۡكُرُ لِنَفۡسِهِۦۖ وَمَن كَفَرَ فَإِنَّ رَبِّى غَنِىٌّ كَرِيمٞ ٤٠

Meaning: Said a person who has knowledge from AI Kitab [1097]: "I will bring the throne to you before your eyes blink". So when Solomon saw the throne in

[11] De Graff. "The Application of Scientific Literacy in Learning Physics to Improve Students' Critical Thinking in Solving Problems." Vol. *5*, (2015).

[12]N. Isnaeni, "Influence of SETS Science Learning Towards Scientific Literacy Improvement Program.", (2019): 59–66.

[13]V. Dragoş & V. Mih, "Scientific Literacy in School.", *Procedia-Social and Behavioral Sciences, 209,* (2015): 167–172.

[14]H. Ababeth, "Sunstainable reserve food garden (SRFG): Development of Booklet", Vol. *7,* No. 2, (2017): 63-65.

[15]P. Chinn, K. Maeona, & Kramer, "Knowledge Development in Nursing E-book: Theory and Process." Vol. *4,* No. 6, (2017): 1345–1347.

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front of him, he also said: "This includes the gift of my Lord to try me. Do I give thanks or deny (for His blessings). And whoever is grateful Then surely He is grateful for (good) himself and whoever deny, then verily my Lord is rich, glorious ".

The explanation above illustrates that science and technology teach us about the development of knowledge possessed by humans, will provide evidence that something previously impossible to do, but becomes something commonplace or commonplace in the future. For example, the presence of e-books in the past was considered nonsense, because people only believed that data stored in the form of information could only be done through books that had conventional meaning. Namely made of paper and printed into books, however, at this time electronic books (e-books) are becoming a common thing and commonplace for today's society. So that books can be stored on chips in hundreds or even thousands of pages through the media of information technology.

The ability of students' scientific literacy is influenced by several factors, including the curriculum and education system, the selection of learning methods and models, learning facilities and facilities as well as learning resources. The independent variable that consistently influences students' scientific literacy as reading ability, mathematical ability, and technological facilities as a source of learning support.[16] Factors that influence the ability of scientific literacy, the use of *e-book* teaching materials *based on discovery learning models assisted by the flipbook maker kvisoft* become an important part that needs to be developed in the learning process to facilitate and improve students' scientific literacy abilities.[17]

E-books, one of which as a medium uses electronic channels to store and transport various information and multimedia information-transport

[16]M. Farisi, "Development of the 21st Century Social Studies Through Technology Integration" *Turkish Oline journal of distance education,* Vol. *17,* No. 1, (2015): 16-30.

[17]A. Latif & A. Permanasari, "Development of Multimedia Learning Based on Scientific Literacy of Students for Junior High School Students on The Theme of Technology", (2015).

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technologies that integrate text, sound, images, video, and animation. *E-books* can eliminate damage problems such as abrasion and tear (Lai, 2016). *E-Books* mainly include books, journals, and magazines. Most *e-books* have features such as in-book or in-collection search, bookmarks, highlights, note-taking, and annotations.[18]

E-books are books that are used electronically through computers or mobile devices. According to Arini & Kustijono's research, with the Development of Interactive Electronic Books (Budin) using professional flip pdf to train higher-order thinking skills, BUDIN was declared effective in high-level thinking skills trained in high-level thinking skills (obtained through tests and observation) and student responses.[19] *Kvisoft flipbook maker* has a template design and features such as background, control buttons, navigation bar, hyperlink, and back sound.[20]

The *Discovery learning* model trains students to discover their concepts by providing problems that students must solve through media that will be used.[21] *Discovery Learning is* an example of a Learning model where educators give students the freedom to find something themselves that emphasizes the basic patterns including observing, clarifying, measuring, predicting, determining, and presenting communicating.[22]

The *Discovery Learning* model is suitable for use in a variety of physics materials. One of them is the material of momentum and impulses and harmonious vibrations learned by MA N grade X students. In this material, a lot of experimental and observational activities can be done to train students to

[18] JKL Poon, "Empirical Analysis of Factors Affecting the E-Book Adoption — Research Agenda.", (2014): 51–55.

[19]D. Arini & R. Kustijono, "The Development of Interactive Electronic Book (Budin) Using Flip PDF Professional to Train Higher Order Thinking Skills." Vol. *06 No. 03,* (2017): *312 - 318.*

[20]T. Jones & C. Brown, "Reading engagement: A Comparison between E-books and Traditional Print Books in an Elementary Classroom." *International journal of instruction,* Vol. *4,* No. 2, (2011).

[21]D. Brigenta, J. Handhika, & M. Sasono, "Development of Discovery Learning Based Modules to Improve Concept Understanding." (2017): 167–173.

[22]A. In'am & S. Hajar, "Learning Geometry through Discovery Learning Using a Scientific Approach." Vol. *10, No.* 1, (2017): 56–70.

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play an active role in carrying out the science process skills during the learning activities supported scientific attitude taken by students to find the basic principles of physics.[23]

Research conducted by previous researchers on diverse teaching materials. Ghofur & Kustijono, developed a *kvisoft flipbook flash e-book* based on straight motion kinematics material as a learning tool for high school students in Class X.[24] Cahyanti & Akhlis, developed an *e-book* as an implementation of guided inquiry learning model *atwood* material for high school student.[25] Permanasari, developed the physics *e-book* learning media assisted by *Kvisoft Flipbook Maker* in the material of straight and circular motion.[26]

Arini & Kustijono, developed interactive electronic books (Budin) using professional flip pdf to practice higher-order thinking skills.[27] Researchers who have used applications on the development of *e-book* learning media such as 3D *Pagelip Professional, Adobe flash CS* 6, *Adobe Indesign CS* 6, *sigil* applications, *Macromedia flash* 8, and others, but the *e-book* still has flaws that need to be improved namely animation in the *e-book* it can't work, interactive evaluation questions and animations in the evaluation questions haven't been included. In the relevant research there are differences and updates from each study conducted.[28]

[23]B. Tompo, A. Ahmad, & M. Muris, "The Development of Discovery-Inquiry Learning Model to Reduce the Science Misconceptions of Junior High School Students." Vol. *11,* (2017), https://doi.org/5676-5686

[24] A. Ghofur, "Development of Flash-Based Evisbook Kvisoft Flipbook on Straight Motion Kinematics Material as a Means of Learning for High School Students in Class X." *Physics Education Innovation,* Vol. *4,* No. 2, (2015).

[25] Rd. Cahyanti, & I. Akhlis, "Development of E-Book as Implementation of Inquiry Learned Learning Model for Atwood Machine Material for Students of SMA N 1 Kradenan." *Upej Unnes Physics Education Journal,* Vol. *4,* No. 1, (2015).

[26] A. Latif & A. Permanasari, "Development of Multimedia Learning Based on Scientific Literacy of Students for Junior High School Students on The Theme of Technology", (2015).

[27] D. Arini & R. Kustijono, "The Development of Interactive Electronic Book (Budin) Using Flip PDF Professional to Train Higher Order Thinking Skills." Vol. *06 No. 03,* (2017): *312 - 318.*

[28] B. Putra Hari Searmadi, & R. Harimurti, "Application of Flipbook Innovation as Learning Media to Improve Learning Outcomes Introduction to PHP Class XI RPL at SMK Negeri 2 Mojokerto." *IT-EDU,* Vol. *1,* No. 02, (2016): 42–48.

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The researchers developed this thing in common with developing *e-books* and using the *kvisoft flipbook maker* application. The difference with previous research is that the previous researchers used students 'learning independence and circular motion material while the researchers used students' scientific literacy skills in terms of knowledge and competence, interactive questions of objective form, as well as the integration of verses of the Koran.

The use of the *kvisoft flipbook maker* application becomes more interesting and easily understood by students. *Kvisoft Flipbook Maker* can also make PDF files to be like a magazine, Digital Magazine, *Flipbook.* Using this software, media display will be more varied, not only text, images, videos, and audio can also be embedded in this media so that the learning process will be more interesting.[29]

Based on the background above, the researchers conducted a development study with the title: "Development of *e-book learning based on discovery learning models assisted by the flipbook maker Kvisoft* to the scientific literacy of class X-IPA students in MAN 2 Padang Pariman which is valid, practical and effective.

To develop *e-book* teaching materials *based on discovery learning models assisted by Kvisoft Flipbook Maker* on students' scientific literacy abilities. To produce quality *e-book* teaching materials *based on discovery learning models assisted by Kvisoft Flipbook Maker* on the scientific literacy ability of students in terms of valid, practical, and effective.

Literature Review

Teaching materials

Teaching material is a set of teaching material/substance (teaching material) that is arranged systematically, showing a complete figure of

[29] APAR. Sugianto, "Development of Science Literacy-Based Learning Materials Temperature and Heat Materials." *Phenomenon: Journal of Mathematics* and *Natural Sciences Education,* Vol. *7,* No. 1, (2017): 58–67.

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the competencies that will be mastered by students in learning activities.[30] Components of teaching materials; Learning objectives, evaluation sheets, module positions, and functions within a broader program unit, student activity sheets, which contain the substance of competencies to be studied/delivered, student worksheets, key worksheets, and guidelines for educators.[31]

E-Book

E-Books mainly include books, journals, and magazines. Most *e-books* have features such as in-book or in-collection search, bookmarks, highlights, note-taking, and annotations.[32] *E-books* are digitally formed content that is presented in many ways, such as text, images, videos, and animations, using appropriate reading tools and reading software, *e-books* can replace traditional paper-based readings, and disseminate information to the public.[33] Electronic books are more economical and save time than printing.[34]

Short-form *e*-books electronic books are electronic counterparts of printed books, which can be seen on desktop computers or portable devices such as laptops, or e-book readers, or applications.[35] E-Books include different multimedia effects, such as written text, oral reading, oral discourse, animation, music, and sound effects.[36] *E-books* can be used as a source of learning in the learning process to be easier, more efficient, and make students quick to capture

[30] Ministry of National Education, *Guidelines for Development of Teaching Materials,* (2008).

[31] DL. Lowther, JD. Russell, & SE. Smaldino, "Instructional Technology & Media for Learning Learning Technology and Media for Learning (Translation. Ninth Edition)." (Jakarta*:* Kencana Prenada Media Group, 2011).

[32] JKL Poon, "Empirical Analysis of Factors Affecting the E-Book Adoption — Research Agenda.", (2014): 51–55.

[33] C-S. Lai, "Integrating E-Books into Science Teaching by Preservice Elementary School Teachers.", *Journal of Education in Science, Environment and Health,* Vol. *2,* No. 1, (2016): 57–66.

[34] Dgh. Divayana, Pwa Suyasa, & A. Adiarta, "Making of Digital Books Based on Kvisoft Flipbook Maker for Teachers in SMK Ti Udayana." *Abdimas Dewantara*, Vol. *1,* No. 2, (2018): 31–44.

[35] F. Loan & Refhat, "*Open Access E-books in Science and Technology: A Case Study of the Directory of Open Access Books." Vol. 35,* No. 4, (2015): 304-309.

[36] Korat & Shamir, "Electronic Books Versus Adult Readers: Effects on Children's Emergence Literacy as a Function of Social Class." Vol. *23,* (2007): 248–259. https://doi.org/doi: 10.1111 / j.1365-2729.2006. 00213.x

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learning material.[37] *The e-book* at the outset was beyond meeting the needs of *e-book* readers, this device is now more user friendly which has led to the spread of this device with technological developments.[38]

Book skins consist of front skin or face skin, back skin contents of a book if more than 100 pages are bound with glue or sewing thread but if the contents of the book are less than 100 pages do not use back skin. To be more attractive, the skin of the book is designed attractively, such as giving illustrations that fit the contents of the book and using the name of the subject.[39]

Discovery Learning

Discovery Learning is a learning method that encourages students to ask questions and draw conclusions from general principles of practical examples of experience. Bruner argues that in *discovery learning* students organize material learned with a final form and increase the intellectual potential of students.[40]

Learning based on the search for knowledge is a form of searching for truth through knowledge. As for the arguments that explain this is Al-Qur'an Surat Thaha verse 114, in which Allah SWT says:

فَتَعٰلَى ٱللَّهُ ٱلْمَلِكُ ٱلْحَقُّ ۗ وَلَا تَعْجَلْ بِٱلْقُرْءَانِ مِن قَبْلِ أَن يُقْضَىٰٓ إِلَيْكَ وَحْيُهُۥ ۖ وَقُل رَّبِّ زِدْنِى عِلْمًا

Meaning: So Most High is Allah, the real King, and do not rush to read the Qur'an before it is perfected to reveal it to you, and say: "O my Lord, add to me knowledge".

[37] Siti Kholifah, Paul Hartanto, & Iwan Koerniawan, "Development of E-Books With Flipbook Maker Software For Learning Financial Accounting Courses At Semarang Booth." *Vol.2,* (2017).

[38] M. Yalman, "Preservice Teachers' Views About E-Books and Their Levels of Use of E-Books.", *Procedia-Social and Behavioral Sciences,* Vol. *176,* (2015): 255–262.

[39] SC. Lim & Jhonson, "Development of Scientific Approach Based on Discovery Learning." Vol. *2,* No. 3, (2015): 25–33.

[40] F. Kristin, "Analysis of Discovery Learning Models in Improving Student Learning Outcomes of SD.", *Journal of Basic Education Perkhasa: Journal of Basic Education Research,* Vol. *2,* No.1, (2016): 90–98.

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Based on the above explanation, humans are required to ask Allah SWT to add knowledge. This does not mean passive in humans merely asking, but it also means actively seeking knowledge through various efforts to seek knowledge itself through research activities or search for knowledge to continue to develop the knowledge that humans already have

The purpose of *discovery* learning is as follows: Students can actively participate in the learning presented**;** So that students grow themselves while instilling an attitude of *inquiry* (searching)**;** So that students can solve problems independently So that students can learn how to learn (*learn how to learn*), learn to respect themselves, motivate themselves and are easier to transfer, minimize or avoid memorization**;** To create a vehicle for interaction between students, students and educators, and the environment**;** In the discovery of students have the opportunity to be actively involved in learning.[41]

Kvisoft Flipbook Maker

Kvisoft flipbook maker is a type of professional software that converts PDF files into book forms, on-page devices that can be added editing functions, allows inserting videos, numbers, audio, hyperlinks, host and multimedia objects.[42] *Kvisoft Flipbook Maker* can also make PDF files into a magazine, digital magazine, *flipbook,* company catalog, digital catalog, and others.[43]

The result can be saved to Html, exe, zip format.[44] *Kvisoft Flipbook Maker* application can display interactive simulations by combining text, images, audio, video, and animation so that learning can take place more interesting and

[41] S. Mawaddah, & R. Maryanti, "Ability to Understand Mathematical Concepts of Middle School Students in Learning Using the Guided Discovery Model (Discovery Learning).", *EDU-MAT,* Vol. *4,* No. 1, (2016).

[42] AN. Apsari & R. Kustijono, "Development of E-Books Using Kvisoft Flipbook Maker to Train Science Process Skills for Senior High School Students in Curriculum 2013 Inov." *Educator Fis. (IPF),* Vol. *6,* No. 3, (2017): 285.

[43] NN. Mulyaningsih & DL. Saraswati, "Application of Digital Book Learning Media with Kvisoft Flipbook Maker." *Journal of Physical Education,* Vol. *5,* No. 1, (2017): 25–32.

[44] Dgh. Divayana, Pwa Suyasa, & A. Adiarta, "Making of Digital Books Based on Kvisoft Flipbook Maker for Teachers in SMK Ti Udayana." *Abdimas Dewantara*, Vol. *1,* No. 2, (2018): 31–44.

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enjoyable.[45] *Kvisoft flipbook maker* has a template design and features such as background, control buttons, navigation bar, hyperlink, and back sound. The result can be saved to *Html, exe, zip, screen saver and app* formats, *SWF*, or *flash.* Also, the output of the *Kvisoft Flipbook Maker* can be presented via a PC or mobile phone with an Android system.[46]

Science Literacy

Scientific Literacy is one of the important fields of assessment together with reading and mathematics. [47] Science literacy is knowledge and understanding of scientific concepts and processes needed in making personal decisions, contributing to cultural and social activities, and economic productivity.[48] Science literature describes a person's ability to understand laws, theories, phenomena, and scientific matters.[49]

Science literacy in various social contexts (in and out of school), may hopefully advance science educators in making learning to read and write meaningful texts in contexts that are meaningful and relevant to their science education.[50] Science Literacy consists of knowledge and understanding of science concepts and processes needed for personal decision making, participation in civil and cultural affairs, and economic productivity.[51]

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[45] DA. Nugraha, "Development of Bilingual Interactive E-Book Media on Core Material for High School Class X." *Physics Education Innovation,* Vol. *3,* No. 1, (2014): 1–7.

[46] T. Jones & C. Brown, "Reading Engagement: A Comparison Between E-Books and Traditional Print Books in An Elementary Classroom." *International journal of instruction,* Vol. *4,* No. 2, (2011).

[47] L. Udompong & S. Wongwanich, "Diagnosis of The Scientific Literacy Characteristics of Primary Students." Vol. 16, No. *01,* (2013): 5091–5096.

[48] A. Winata & IS RW, "Early Literacy Skills of Students of Class V SDN Sidorejo I Tuban on Water Recycling Materials." *JTIEE (Journal of Teaching in Elementary Education),* Vol. *2,* No. 1, (2018): 58–64.

[49] V. Dragoş, & V. Mih, "Scientific Literacy in School.", *Procedia-Social and Behavioral Sciences, 209,* (2015): 167–172.

[50] G. Sorvik & SM. Mork, "Scientific Literacy as Social Practice: Implications for Reading and Writing in Science Classrooms." Vol *11,* No. 3, (2015): 268–281.

[51] KM. Hernandez, C. Ikpeze, & I. Kimaru, "Perspectives on Science Literacy: A Comparative Study of The United States And Kenya." Vol. *4,* No. 2, (2015): 25–34.

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Research Methods

ADDIE first appeared in 1975. The book was created by the center of Educational Technology at Florida State University. The ADDIE model was developed by Dick and Cary in 1978 and Russell Watson was revised in 1981 and is considered important in the development of education and training programs. [52] One of the development models applied in research and development (Research *and Development)* is ADDIE which is one of the systematic learning models. ADDIE stands for *Analysis, Design, Development, Implementation, and Evaluation.* Product development steps such as models, learning strategies, media, and teaching materials.

Validation Test

The validation test is based on aspects that are to be achieved at the product validation stage, namely validation in terms of content or learning material in the media in terms of quality, instructions for media use, the language of language in terms of language selection, and suitability.

Practicality Test

Practicality test to measure the extent of product limitations when implemented in the learning process in terms of ease of use and ease of understanding concepts and increasing scientific literacy in class X MAN 2 Padang Pariaman.

Effectiveness Test

The effectiveness test is carried out to find out the effectiveness of the product being developed as an alternative in helping to improve students'

[52] G. Muruganantham, "Developing an E-content Package by Using the ADDIE Model.", (2015): *52 - 54.*

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scientific literacy skills. The effectiveness test is given to students of class X MAN 2 Padang Pariaman.

Subjects Valid, Practical, and Valid

The subjects of this development research trial are as follows:

1. The validation subject consisted of 5 validators who were experts in their fields, namely 2 material validators, 1 language validator, and 2 media validators.
2. Practicality subject, consisting of 1 Physics Educator MAN 2 Padang Pariaman and 10 Students of Class X MIPA 1 MAN 2 Padang Pariaman.
3. The subject of effectiveness, consisting of 19 students of class X MIPA 1 MAN 2 Padang Pariaman.

Data Type

Data collected in this study include quantitative and qualitative data, namely:

a. Qualitative data is data about the process of developing teaching materials in the form of criticism and suggestions from material experts, linguists and media experts, educators, and students.
b. Quantitative data is the main data in research in the form of feasibility assessment data on teaching materials from data opinions/responses of material experts, linguists, media experts, educators, and students.

Research and Development Instrument

Data collection instruments in this study were carried out with several techniques as in table 1 below.

Table 1. Data Collection Instruments

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No	Criteria	Instrument
1	Valid	a. Validation instrument evaluation sheet b. Practicality instrument evaluation sheet c. Effectiveness instrument evaluation sheet d. Sheets resource validation *e-book -based discovery learning is aided kvisoft flipbook maker* to improve the scientific literacy of students in class X SMA / MAN
2	Practical	a. Questionnaire practicality by educators b. Questionnaire practicality by students
3	Effective	questionnaire sheet

Data Analysis and Processing Techniques

Table 2 weights validity statement validity questionnaire

Statement	Statement weight
81-100	Very valid
61-80	Valid
41-60	Valid enough
21-40	Invalid
0-20	Very invalid

(Riduwan 2010)

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Calculation of the final value data of the validation results analyzed in (0-100) is performed using the following formula:

$$V = \times 100\%$$

Information:

V = the value of the validity of *e-book* teaching materials *based on the discovery learning model assisted by Kvisoft Flipbook Maker* on students' scientific literacy

f = score obtained from the results of the validation of *e-book* teaching materials *based on discovery learning models assisted by kvisoft flipbook maker* on the scientific literacy of students.

Y = maximum score of the results of the validation of *e-book* teaching materials *based on the discovery learning model assisted by Kvisoft Flipbook Maker* on students' scientific literacy.

Practicality Analysis

The questionnaire used for practicality analysis uses a Likert scale. The questionnaire is arranged in a positive category, which is a positive statement obtaining the highest weight. Practicality analysis is determined through data analysis techniques using the formula:

$$P = \times 100\%$$

Information:

P = the value of the practicality of *e-book* teaching materials *based on the discovery learning model assisted by Kvisoft Flipbook Maker* on students' scientific literacy

X = Score obtained from the results of the practicality of *e-book* teaching materials *based on the discovery learning model assisted by Koftoft Flipbook Maker* on the scientific literacy of students.

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Y = Maximum score of *e-book* teaching materials *based on discovery learning models assisted by Koftoft Flipbook Maker* on students 'scientific literacy against students' scientific literacy.

The weight of the practicality assessment of *e-book* teaching materials *based on discovery learning assisted by Koftoft Flipbook* Maker on the participant's scientific literacy can be seen in Table 3.

Table 4 Weight of Statement of Practicality of *E-Book* Teaching Materials

Interval Weight	the interval	category
5	81-100	Very practical
4	61-80	Practical
3	41-60	Practical enough
2	21-40	Not practical
1	0-20	Very impractical

(Riduwan, 2010)

Practical and very practical products when in the range 61-100.

Effectiveness Analysis

a. Science Literacy Questionnaire

The questionnaire used for the analysis of scientific literacy of students towards products uses a *Likert* scale. The questionnaire is arranged in a positive category, which is a positive statement obtaining the highest weight. Assessment analysis is determined through data analysis techniques using the formula:

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E = × 100%

Information:

E = the final value of effectiveness

N = maximum score

f = score acquisition.

Table 5 Table of Effectiveness Categories

Interval Weight	Interval	Category
5	81-100	Very effective
4	61-80	Effective
3	41-60	Effective enough
2	21-40	Ineffective
1	0-20	Very ineffective

(Modified from Riduwan 2010)

Results and Discussion

Research was conducted at MAN 2 Padang Pariaman in class X with several students 19 people. The teaching material used is an *e-book* that is presented interestingly with additional videos to help students understand the subject material about momentum and impulses and simple harmonious movements. Teaching materials are distributed to students in the form of a folder that contains *e-books* in the format of Html and exe, in addition to the two

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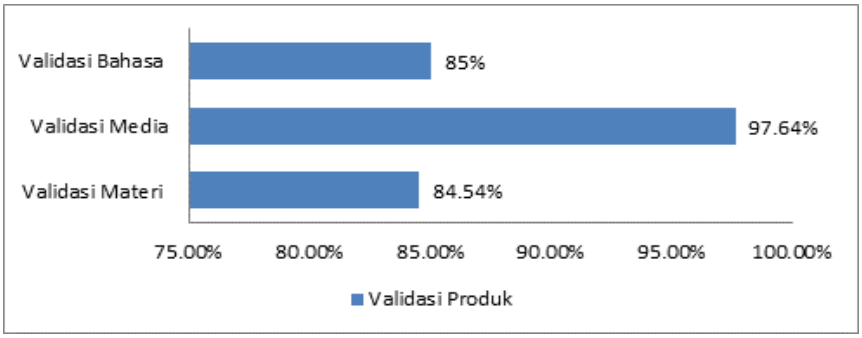
formats in the folder are also given instructions for using *e-book* teaching materials. The following is an example of how *e-book* teaching materials are displayed and how to use them

Validity, practitioner, and effective value data can be seen in the following description:

1. Product Validity

To find out the level of feasibility of *discovery learning-based e-book* teaching materials *assisted with flipbook maker koftoft,* it is necessary to validate both the material, media, and language experts to improve the *discovery - based* teaching material of *kvisoft-flipbook maker -assisted learning* in the trial to try out to students. The results of the study were obtained through validation of material, media, and language consisting of 5 lecturers from the State Islamic University of Imam Bonjol Padang in the following chart.



Graph 1 Product Validity

Graph 1 Stating that the average test the validity of teaching materials *e-book -based discovery learning is aided kvisoft flipbook maker* to learner's scientific literacy ability is 85% with a very valid category. The suitability of Kvisoft Flipbook Maker e-book teaching materials to improve the scientific literacy ability of students obtained an average grade of 84.54%, while media

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interest obtained an average value of 92.5%, language ease obtained an average value of 85%.

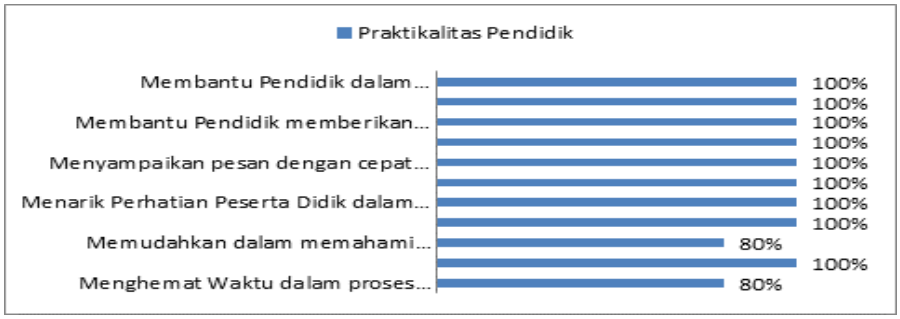
Research by D. Sugianto, et al (2013) about *virtual modules; multimedia flipbook basic digital techniques, the* results obtained that after the product validity test is held so that it meets the eligibility as a learning medium. Research by Poon, (2014) on *Empirical Analysis of Factors Affecting the E-Book Adoption — Research Agenda.* 51–55.

2. Product Practicality

The practicality test consists of two namely practicality test by physics educators and practicality test by students.

a. Practicality Test by Physics Educators.

Data of practicality test results by educators can be seen in the following graph 2.



Graph 2 states the value of the results of the educator practicality questionnaire filled in by 1 educator. The average results obtained from one practitioner is 97.64% with a very practical category. Data processing practicality test results by 1 educator.

b. Practicality Test by Students

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Data on practicality test results by students can be seen in the following graph 3

Graph 3 Data Value Results Questionnaire Practicality of Students

Graph 3 states the results of the questionnaire practicability of students filled in by 10 students. The average results obtained from 10 practitioners 80.35% with very practical categories. Research conducted by Ghofur on *the development of kvisoft-based e-book flipbook maker on the kinematics of rectilinear motion of matter as a learning tool SMA / MA Class X.*[53] The results show that the product developed is in the very feasible category with a percentage of 84.31% and based on the implementation and constraints of the limited trials conducted it can be *concluded that the e-book* developed is very practical. Practicality is reviewed by students who can operate *e-books* that are developed smoothly and independently.

3. Effectiveness Test

The effectiveness test was conducted to find out the quality of *discovery learning-based e-book* teaching materials *assisted*

[53]A. Ghofur & R. Kustijono, "*The Development of E-Book Kvisoft Flash Flipbook Based on Kinematics of Rectilinear Motion of Matter As A Learning Tool High School Students Of Class X.*" Vol. *04 No. 02,* (2015): 2302–4496.

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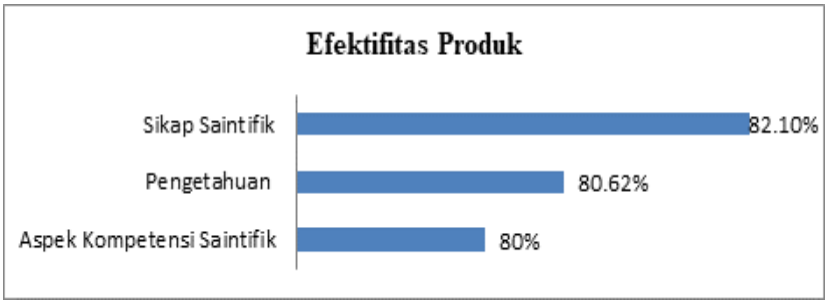
by Kvisoft Flipbook Maker on students' scientific literacy abilities. The instrument used in the form of a questionnaire was tested on 19 students of class XI MIA 2 Padang Pariaman.



The results of this study were also supported by several previous researchers, among others: Research Results by Pusparini, 2016 concerning the *development of a digital programming module web programming with Koftoft Flipbook Maker at SMK Negeri 1 Surabaya.* The results obtained are the developed media is then tested to determine the feasibility and effectiveness of the media developed to 3 validators stating that the quality of digital module media produces a value of 82% with very valid criteria, the results of students' responses produce 100% with very good criteria.

The development of the world of education is very significant along with the development of science and technology.[54] Advances in technology and communication affect learning in the 21st century. The development of technology that is growing rapidly also has an impact on the world of education, especially in the mindset of students who want to be fast in meeting their learning needs.[55] Science literacy must be built from the beginning of school because with scientific literacy abilities students have knowledge and understanding of science concepts and scientific processes that will enable

[54] Hidayatullah and Rakhmawati (2016) =

[55] H. Kinshuk, & N. Chen, "Trends in Educational Technology through the Lens of the Highly Cited Articles Published in the Journal of Educational Technology and Society." *Kinshuk@athabascau.ca,* Vol. 6, No. *2*, (2013): 3–20.

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students to make decisions with the knowledge they have.[56] Development of scientific literacy of students includes knowledge about science, science processes, development of scientific attitudes, and students' understanding of science so that students not only know science concepts but can also apply the ability of science to solve various problems and can make decisions based on scientific considerations.[57]

According to Adisendjaja, Science literacy is the ability to use scientific knowledge to identify problems and draw conclusions based on evidence to understand and make decisions about nature and changes made to nature through human activities.[58] The cause of students' scientific literacy has not been achieved due to several factors, most of which occur because the learning process has not been maximized and the existing learning resources do not emphasize students to be more active, even though when using certain teaching materials that are made interesting and following students, the role of educators is no longer just conveying the material but as a guide and reinforcing material. Limitations of students in learning in the classroom that is still dependent on educators and learning resources that are used to be one of the causes of students' scientific literacy ability are still low. According to Kurnia et al, in their research results, the low scientific literacy ability of Indonesian students is influenced by many things, including the curriculum and education system, the selection of teaching methods and models by educators, learning facilities and facilities, learning resources, teaching materials, and etcetera. One of the causes of students' low scientific literacy skills is the lack of teaching materials that can shape science literacy skills.[59]

[56] N. Isnaeni, "Influence of SETS Science Learning Towards Scientific Literacy Improvement Program.", (2019): 59–66.

[57] Y. Yuliati, "Science Literacy in Science Learning.", *Journal of Horizon Pendas,* Vol. *3,* No. 2, (2017): 21-28.

[58] YH. Adisendjaja, "Analysis of Class X Biology Textbooks in Bandung City Based on Science Literacy." *Bandung: Department of Biology Education, FMIPA Universitas Pendidikan Indonesia,* (2008): 1–13.

[59] F. Kurnia & A. Fathurohman, "Analysis of High School Physics Teaching Materials in Class Xi in North Indralaya Sub-District Based on Scientific Literacy Categories." Vol. 1, No. 1, (2014): 43–47).

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Teaching materials that are found more focused only on the material, less contextual, and tend to be monotonous and the lack of scientific knowledge in solving a problem in teaching materials. Student textbooks provided from schools so far are not limited to not leading to students' scientific literacy.

Every individual in the global era is demanded to be able to develop their ability to compete at the international level. One of the governments to obtain human resources to compete in the global era is by making efforts to improve the quality of education.[60] Along with the development of computer information technology (ICT) for the visualization of concepts in physics, learning materials has been done by adding images as we find them in textbooks or moving objects (animations) displayed on a computer.

The use of computers not only helps show animation but is also used as a medium for presenting teaching materials such as books.[61] Teaching material is a set of teaching material/substance (teaching material) that is arranged systematically, showing a complete figure of the competencies that will be mastered by students in learning activities.[62]

An electronic book (*e-book*) is a general term that refers to digital representations of printed material sent through media such as personal computers, netbooks, e-book readers, PDAs, smartphones, and iPads. *E-Books* mainly include books, journals, and magazines. Most e-books have features such as in-book or in-collection search, bookmarks, highlights, note-taking, and annotations.[63] Electronic book readers can search for topics they like more easily

[60] APAR Sugianto, "Development of Science Literacy-Based Learning Materials Temperature and Heat Materials." *Phenomenon: Journal of Mathematics* and *Natural Sciences Education,* Vol. *7,* No. 1, (2017): 58–67.

[61] V. Khanchandani & M. Kumar, "Mapping of E-books in Science & Technology: An Analytical Study of the Directory of Open Access Books." *DESIDOC Journal of Library & Information Technology,* Vol. *37,* No. 3, (2017): 172–179.

[62] Ministry of National Education, *Guidelines for Development of Teaching Materials,* (2008).

[63] JKL Poon, "Empirical Analysis of Factors Affecting the E-Book Adoption — Research Agenda.", (2014): 51–55.

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and quickly than those printed, the possibility of accessing the desired content, and the lack of need for a physical presence in the library.[64]

Discovery Learning is a learning method that encourages students to ask questions and draw conclusions from general principles of practical examples of experience. Bruner argues that in *discovery learning* students organize material learned with a final form and increase the intellectual potential of students.[65]

According to Mawaddah & Maryanti, The purpose of *discovery* learning is as follows; Students can actively participate in the learning presented; So that students grow themselves while instilling an attitude of *inquiry* (searching); So that students can solve problems independently So that students can learn how to learn (*learn how to learn*), learn to respect themselves, motivate themselves and are easier to transfer, minimize or avoid memorization; To create a vehicle for interaction between students, students and educators, and the environment.[66]

Kvisoft Flipbook Maker is a powerful software designed to convert PDF files to digital publications or digital book turning pages.[67] This software can change the appearance of PDF files to be more interesting as a book. *Kvisoft Flipbook Maker* can also make PDF files into a magazine, digital magazine, *flipbook,* company catalog, digital catalog, and others.[68]

Conclusion

[64] Rd. Cahyanti, & I. Akhlis, "Development of E-Book as Implementation of Inquiry Learned Learning Model for Atwood Machine Material for Students of SMA N 1 Kradenan." *Upej Unnes Physics Education Journal,* Vol. *4,* No. 1, (2015).

[65] F. Kristin, "Analysis of Discovery Learning Models in Improving Student Learning Outcomes of SD.", *Journal of Basic Education Perkhasa: Journal of Basic Education Research,* Vol. *2,* No.1, (2016): 90–98.

[66] S. Mawaddah, & R. Maryanti, "Ability to Understand Mathematical Concepts of Middle School Students in Learning Using the Guided Discovery Model (Discovery Learning).", *EDU-MAT,* Vol. *4,* No. 1, (2016).

[67] H. Whiley, D. Houston, & A. Smith, "Engaging Students in Environmental Health and Increasing Scientific Literacy Through the Use of Cultural Hooks and Authentic Challenge Based Strategic Learning.", Vol. *15,* No. 2, 1–17.

[68] NN. Mulyaningsih & DL. Saraswati, "Application of Digital Book Learning Media with Kvisoft Flipbook Maker." *Journal of Physical Education,* Vol. *5,* No. 1, (2017): 25–32.

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The results of the study can be concluded that the development of *e-book* teaching materials *based on discovery learning assisted by Koftoft Flipbook Maker* on material momentum and impulses and simple harmonious vibrations of class X MIA 1 MAN 2 Padang Pariaman deserves to be used according to very valid and practical criteria. The results of the validity test analysis by the expert validator showed *e-book* teaching materials *based on discovery learning assisted by flipbook makers* that were developed valid with an average of 86.25%, practical analysis results with an average of 80.35%, the results of practicality analysis by educators and students with an average of 88.99%, while the results of the effectiveness analysis were 80.90%. According to this study, I found a correlation between technology and Islam, where finally I found a verse from the Qur'an from a chapter of the 80th verse of Al-Anbiyaa:

وَعَلَّمْنَاهُ صَنْعَةَ لَبُوسٍ لَكُمْ لِتُحْصِنَكُمْ مِنْ بَأْسِكُمْ فَهَلْ أَنْتُمْ شَاكِرُونَ

Meaning: And We taught David to make armor for you, to sustain you in your battles; So let you give thanks (to Allah). This means that science in the context of science and technology has made human affairs easier, especially the use of e-books in application-based learning in physic education.

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