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Implementation Of Interactive Digital Books In Project-Based Learning To Improve Learning Outcomes

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Abstract – The use of technology is very useful in the learning process. The use of interactive digital books has not been implemented in biology learning strategy and design lectures with a project-based approach. For this reason, this research was carried out to see student learning outcomes using interactive digital books through project-based learning. This research is an experimental study (control group design) with a sample of students who are taking biology learning strategy and design lectures at STKIP Ahlusunnah and at PGRI University, West Sumatra. The instrument used is in the form of questions. Data obtained in descriptive form and processed using SPSS. The results showed that the application of interactive digital books was able to improve student learning outcomes through project-based learning. It was concluded that the use of interactive digital books using project-based learning could improve student learning outcomes.

Keywords – Implementation, Interactive digital books, Project-Based learning, Learning outcomes

I. INTRODUCTION

Technology has a very important role in the era of the industrial revolution. Technological advances bring enormous changes to education, especially in the way students learn or are often called digital natives [1]. The characteristic of digital native is being able to do several activities at the same time, such as listening to music while reading [2]. Digital technology is an inseparable part of native digital life because this generation is very proficient in using technology [3]. This generation is easier to learn by using technology. Students who learn through native digital processes tend to be more interested in learning by using learning media or technology-based teaching materials that can be accessed through digital devices such as smartphones [4]. This causes lecturers to be able to use technology in developing learning media or innovative teaching materials. This will make learning activities run effectively so that learning objectives can be achieved maximally [5].

Digital-based teaching materials are currently considered very important to facilitate students in learning [6]. Teaching materials must be transformed according to the characteristics of students. especially when students in undergraduate programs are included in Generation Z. Generation Z's mindset tends to be instantaneous and likes visual things [7]. This is what causes this generation to prefer technology-based learning [8]. This means that students are very active digitally and indicate that students are more interested in reading digital literature. Based on the characteristics of Generation Z and the survey results indicate that the activities of thinking, interacting, and behaving in this generation involve more information and communication technology. Based on these characteristics, the learning strategy that will be applied should pay attention to principles such as content presented in visual form, integrating multimedia, and flexibility in studying teaching materials [9].

To improve student understanding in the learning process optimally, interactive digital books are made in the learning process, allowing teaching materials to be modified to be more interesting [10]. Interactive digital books are combining two or more directions of interactive text, graphics, audio, images, video, to control an order, which then creates a two-way relationship between digital books and their users [11]. The integration of interactive digital books with the learning process can encourage

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students to be active in learning. In addition, it can encourage students to be more active in learning and can improve student learning outcomes themselves. The display of images and animations in interactive digital books will help visualize the teaching material that is delivered, so that module readers are helped to understand the contents of digital books easily in understanding difficult concepts [12]. Digital book developed using Project Based Learning (PjBL) learning model.

Project Based Learning (PjBL) is an innovative learning model or approach, which emphasizes contextual learning through complex activities [13]. The focus of learning lies in the core concepts and principles of a discipline of study, involving students in problem solving investigations and other meaningful task activities, giving students the opportunity to work autonomously in constructing their own knowledge, and culminating in producing real products [14]. Project-based learning is a learning model that uses problems as the first step in collecting and integrating new knowledge based on experience in real activities [15]. PjBL is designed to be used on complex problems that students need to investigate and understand [16].

The use of digital books has been carried out in various courses at universities, not forgetting the biology learning strategy and design courses. The innovation of making digital books has been carried out since 2021 and is accompanied by interactive additions to the developed digital books. This innovation continues to be improved by several relevant experts in the development of interactive digital books that are carried out. The results of the innovation have shown that the developed interactive digital book can be applied in learning because it has been very valid and practical from experts who assess the interactive digital book developed in the biology learning strategy and design course. Digital books can also increase the motivation of students.

Seeing that digital books have been very valid and practical that have been developed and can increase motivation, the researchers tried to apply these interactive digital books by using a project-based learning model in biology learning strategy and design lectures. Digital books can also increase the motivation of students. The application of this interactive digital book is carried out on two campuses, namely STKIP Ahlusunnah and PGRI University, West Sumatra. The purpose of this study was to see the application of interactive digital books using a project-based learning model to student learning outcomes.

II. RESEARCH METHODS

The method used in this study is a quasi-experimental or quasi-experimental method. The type of Quasi-Experimental design used in this study is in the form of Non equivalent (Pretest and Posttest) control group design which can be seen in Figure 1 as follows: [17].

Fig. 1: Eksperiment Design

Pretest	Treatment	Posttest
O_1	X	O_2

Information:

O1 = Pretest value (before given treatment).

O2 = Posttest value (after being given treatment).

X = Giving treatment [17].

Data obtained in descriptive form and processed using SPSS

III. RESULTS AND DISCUTION

RESULTS

The results of the analysis of student activities carried out at the first meeting can be seen in the following table 1.

Table 1: Average of Pretest and Posttest

No.	Treatment	University	Value
1	Prestest	Ahlusunnah	46
		PGRI Sumatera Barat	48.8

2	Post test	Ahlusunnah	69.53
		PGRI Sumatera Barat	63.76

From the table, it can be seen that the score before being given an interactive digital book was low. After being given a digital book and a post test, the scores of students from both universities increased by more than 15 points.

DISCUSSION

Based on the analysis carried out, this proves that the use of electronic books in the learning process can help students understand the material faster and increase interaction between lecturers and students because students already have provisions with the material discussed [18]. Electronic books provide text that is light to understand, as well as images that are closer to the real form of a component, helping students more easily remember when the original component is used [19]. In addition to text and images that are easy to understand for students, the videos available in e-books also provide references for students in working on the projects they are working on [20]. An electronic book developed with a project-based learning model helps students take an active role in learning, with projects that students work on making students more involved in learning [21].

Project-based interactive digital books on learning strategy and design courses make it easier for students to learn. Project-based interactive digital books present appropriate and appropriate materials to make it easier for students to learn. In addition, there are relevant examples that make it easier for students to learn. Relevant examples according to the learning material will make it easier for students to understand the learning material so that it can improve student learning outcomes. This interactive digital book was developed using message design theory. The use of message design theory can also improve the quality of teaching materials [22]. This is very important to note because it will make it easier for students to understand the learning material [23].

In addition, interactive digital books are developed based on projects so that they can train students' critical thinking skills. Project-based learning is an innovative learning model and emphasizes contextual learning through complex activities [24].

Project-based interactive digital books are required to be able to solve the problems presented in interactive digital books so that they can practice problem solving skills for students [25]. For group learning, interactive digital books allow students to work together intensively, so that mutual cooperation is formed among students. Interactive digital books can develop a democratic nature, where students respect the rights and obligations of each member of the group. Independent teaching materials can provide opportunities for everyone students learn teaching materials according to the pace and rhythm of their respective learning, without having to disturb / be disturbed by other students [26].

This interactive digital book is also able to develop the active and creative nature of students, especially if the learning materials are designed to include exercises and independent assignments for students to be active and creative [27]. Interactive digital books can improve student understanding so that it has an impact on increasing student learning outcomes [28].

REFERENCES

[1] Boyd, L. (2019). Using Technology-Enabled Learning Networks to Drive Module Improvements in the UK Open University. Journal of Interactive Media in Education, 2019(1), 1–7. https://doi.org/10.5334/jime.529.

[2] Kesharwani, A. (2020). Do (How) Digital Natives Adopt a New Technology Differently than Digital Immigrants? A Longitudinal Study. Information & Management, 57(2). https://doi.org/10.1016/j.im.2019.103170.

[3] Nam, J., & Jung, Y. (2021). Digital Natives' Snack Content Consumption and Their Goals: A Means-End Chain Approach. Telematics and Informatics, 63. https://doi.org/10.1016/j.tele.2021.101664.

[4] Lawter, L., & Garnjost, P. (2021). Cross-Cultural Comparison of Digital Natives in Flipped Classrooms. The International Journal of Management Education, 19(3). https://doi.org/10.1016/j.ijme.2021.100559.

[5] Arifin, S., & Sukmawidjaya, M. (2020). Technology Transformation and Its Impact on Lecturer's Performance. JPI (Jurnal Pendidikan Indonesia), 9(1), 153–162. https://doi.org/10.23887/jpi-undiksha.v9i1.24372.

[6] Asrial, Syahrial, Maison, M., Kurniawan, D. A., & Piyana, S. O. (2020). Ethnoconstructivism E-Module to Improve Perception, Interest, and Motivation of Students in Class V Elementary School. Jurnal Pendidikan Indonesia, 9(1), 30–41. https://doi.org/10.23887/jpi-undiksha.v9i1.19222.

[7] Muenks, K., Yan, V. X., Woodward, N. R., & Frey, S. E. (2021). Elaborative Learning Practices are Associated with Perceived Faculty Growth Mindset in Undergraduate Science Classrooms. Learning and Individual Differences, 92. https://doi.org/10.1016/j.lindif.2021.102088

[8] Sadimin Sadimin, Wahyu Hardyanto, & Slamet, A. (2017). Developing an E-Module Based Classroom Action Research Management Training Model for Teachers High School. International Journal of Education and Research, 5(2), 79–90. https://doi.org/10.15294/jed.v5i3.18123

[9] Hadaya, A., Asrowi, & Sunardi. (2018). Perception of Junior High School Students about the Use of E-books as Learning Sources. Jurnal of Educational Science and Technology, 4(1), 55–61. https://doi.org/10.26858/est.v4i1.5219.

[10] Komang Redy Winatha, N., Suharsono, & Agustin, K. (2018). Pengembangan E- Modul Interaktif Berbasis Proyek Jurnal Imiah Pendidikan dan Pembelajaran p-ISSN : 1858-4543 e ISSN : 2615-6091 JIPP, Volume 4 Nomor 3 Oktober 2020 Matematika. Jurnal Pendidikan Teknologi Dan Kejuruan, 4(2), 188–199. https://ejournal.undiksha.ac.id/index.php /JPTK/article/viewFile/14021/9438

[11] Afrila, D., & Yarmayani, A. (2018). Pengembangan Media Pembelajaran Modul Interaktif Dengan Software Adobe Flash pada Mata Kuliah Matematika Ekonomi di Universitas Batanghari Jambi. Jurnal Ilmiah Universitas Batanghari Jambi, 18(3),539. https://doi.org/10.33087/jiubj.v18i3.521

[12] Laili, I. (2019). Efektivitas Pengembangan E- Modul Project Based Learning Pada Mata Pelajaran Instalasi. Jurnal Imiah Pendidikan Dan Pembelajaran, 3, 306– 315. https://ejournal.undiksha.ac.id/index.php /JIPP/article/viewFile/21840/13513

[13] Ismuwardani, Z., Nuryatin, A., & Doyin, M. (2019). Implementation of Project Based Learning Model to Increased Creativity and Self Reliance of Students on Poetry Writing Skills. Journal of Primary Education. Vol. 8(1),hal : 51-58

[14] Uygarer, R., & Uzunboylu, H. (2017). An Investigation of the Digital Teaching Book Compared to Traditional Books in Distance Education of Teacher Education Programs. Eurasia Journal of Mathematics, Science and Technology Education, 13(8), 5365–5377. https://doi.org/10.12973/eurasia.2017.00830a

[15] Riyadi & Rahayu, Y. S. 2017. Strengthening the 21stCentury Skills of Elementary School Studentsthrough the Implementation of Project BasedLearning. Advances in Social Science, Education and Humanities Research (ASSEHR). Vol. 108, Hal253-255.

[16] Mubarokah, N. L., & Wahyudi. (2019). Peningkatan Berpikir Kreatif Pembelajaran Tematik Melalui Penerapan Model Pembelajaran PjBL Siswa SD. Jurnal Pendidikan Surya Edukasi (JPSE). Vol. 5(1),hal: 49-57

[17] Sugiyono.(2015). Metode Penelitian Kuantitatif, Kualitatif dan Kombinasi. Bandung: Alfabeta.

[18] Rosida, Fadiawati, N., & Jalm, T. (2017). Efektivitas Penggunaan Bahan Ajar E-Book Interaktif Dalam Menumbuhkan Keterampilan Berpikir Kritis Siswa. Jurnal Pembelajaran Fisika. Vol. 5(1), hal 35-45

[19] Muhammad, M., Rahadian, D., & Safitri, E.R.(2017). Penggunaan digital book berbasis androiduntuk meningkatkan motivasi dan keterampilanmembaca pada pelajaran bahasa arab. Pedagogia :Jurnal Ilmu Pendidikan. Vol. 15(2), hal: 170-182

[20] Kusumaningrum, S., & Djukri, D. (2016).Pengembangan Perangkat Pembelajaran ModelProject Based Learning (Pjbl) Untuk MeningkatkanKeterampilan Proses Sains Dan Kreativitas. JurnalInovasi Pendidikan IPA. Vol. 2(2), hal : 241 – 251.

[21] Agustin, K., Winatha, K. R., & Suharsono, N. (2018). Pengembangan E-Modul Interaktif Berbasis Proyek Mata Pelajaran Simulasi Digital. Jurnal Pendidikan Teknologi dan Kejuruan, 15(2), 188–199. https://doi.org/10.23887/jtpi.v8i1.2238

[22] Matsun, Andrini, V. S., Maduretno, T. W., & Yusro, A. C. (2019). Development of Physics Learning E-ModuleBased on Local Culture Wisdom in Pontianak, West Kalimantan. Journal of Physics: ConferenceSeries, 1381(1). https://doi.org/10.1088/1742-6596/1381/1/012045

[23] Purnamasari, N., Siswanto, S., & Malik, S. (2020). E-Module as an Emergency-Innovated Learning Source During the Covid-19 Outbreak. Psychology, Evaluation, and Technology in Educational Research, 3(1), 1–8. https://doi.org/10.33292/petier.v3i1.53

[24] Mahendra, I. W. E. (2017). Project Based Learning Bermuatan Etnomatematika dalam Pembelajar Matematika. JPI (Jurnal Pendidikan Indonesia). https://doi.org/10.23887/jpiundiksha.v6i1.9257

[25] Yavuz, M., Çorbacıoğlu, E., Başoğlu, A. N., Daim, T. U., & Shaygan, A. (2021). Augmented Reality Technology Adoption: Case of a Mobile Application in Turkey. Technology in Society, 66. https://doi.org/10.1016/j.techsoc.2021.101598

[26] Elvarita, A., Iriani, T., & Handoyo, S. S. (2020). Pengembangan Bahan Ajar Mekanika Tanah Berbasis E-Modul pada Program Studi Pendidikan Teknik Bangunan, Universitas Negeri Jakarta. Jurnal Pendidikan Teknik Sipil (JPenSil), 9(1), 1–7. https://doi.org/10.21009/jpensil.v9i1.11987.

[27] Tambunan, L. R., Siregar, N. A. R., & Susanti, S. (2020). Implementasi E-book Berbasis Smartphone pada Materi Polinomial di Kelas XI SMA Negeri 4 Tanjungpinang. Jurnal Anugerah. https://doi.org/10.31629/anugerah.v2i2.2521

[28] Kusumayuni, P. N., & Agung, A. A. G. (2021). E-Book with A Scientific Approach on Natural Science Lesson for Fifth Grade Students of Elementary School. Jurnal Ilmiah Sekolah Dasar, 5(1). Jurnal Pedagogi dan Pembelajaran, Vol. 5, No. 1, 2022, pp. 64-74 https://doi.org/10.23887/jisd.v5i1.32048