The Influence of Electronic Children's Storybooks on The Learning Independence of Elementary School Students

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Abstract. The background of this research is that electronic storybooks have been developed for elementary school students who have been declared feasible to be applied in increasing the learning independence of elementary school students, but the effectiveness of electronic storybooks has yet to be discovered. This study aimed to determine the effect of electronic storybooks on the learning independence of elementary school students. This research is experimental. The research instrument uses a questionnaire with a Likert scale. The data analysis technique used the normality test, the two variants similarity test, and the hypothesis test, which consisted of the two average difference tests, the effect test between variables, and the normalized gain test. The final results of the study stated that using electronic storybooks had a practical effect on increasing the learning independence of elementary school students. The implications of this research can be used as a reference in developing learning independence for elementary school students

Keywords: story books, children, electronics, learning independence.

1 Introduction

Learning independence is an individual's ability and tendency to take responsibility for their learning process [1]. This fact involves managing time, organizing resources, identifying learning goals, taking the initiative, and evaluating their progress. A student who is independent in learning can take the necessary steps to achieve their learning goals without relying too much on guidance or direction from others. Independent learning is essential in an educational context because it helps students develop the skills necessary for lifelong learning [2]. By becoming independent in learning, students can develop metacognitive skills, such as planning, monitoring, and evaluating their learning. They can also develop problem-solving, critical, and independent thinking skills.

Learning independence gives students control over their learning process, allowing them to adapt methods and strategies to suit their learning style [3]. It also increases

students' intrinsic motivation, as they feel responsible for their achievements. In the long term, independent learning helps students develop the confidence, persistence, and ability to continue learning even after they leave the school setting.

Teachers play an essential role in developing student learning independence by giving them opportunities to take the initiative, plan their learning, and support them in overcoming obstacles and challenges in the learning process [4]. Thus, learning that promotes independent learning helps students achieve better academic results and prepares them to become independent and independent lifelong learners.

Learning independence must be developed early, including elementary school age [5]. Elementary school students must develop learning independence because this is closely related to the Pancasila student profile, which includes independent elements [6]. Developing independent learning allows students to become active learners, have intrinsic motivation, and regulate themselves in the learning process [7]. The independent element refers to students' ability to take full responsibility for their learning [8]. By developing learning independence, students become more independent in finding and organizing information, setting learning goals, and managing their time and resources effectively.

Learning independence also allows students to develop critical thinking skills, one of the essential elements in the Pancasila student profile [9]. Students can develop analytical, evaluative, and reflective thinking skills by taking the initiative to understand mathematical concepts. They learn to ask questions, solve problems, and make decisions based on rational, evidence-based thinking. In addition, learning independence also reflects Pancasila values, such as having a noble character and working together [10]. When students become independent in learning, they can appreciate good ethical and moral values, such as integrity and honesty. They can also collaborate with classmates in achieving common goals, helping each other, and supporting each other. In addition, by developing learning independence, elementary school students are better prepared to face the demands of 21st-century competencies. Elementary school students are becoming more adaptive, resilient, and ready to face challenges in a changing world. Independent learning also prepares students to become individuals who contribute positively to society, applying Pancasila values such as global diversity and creativity in their daily lives. Therefore, the need for efforts to develop autonomous learning in elementary school students.

Development of independent learning in elementary school students can be done using technology-based learning [11]. Technology can be an effective tool to help students develop their independent learning [12]. In technology-based learning, students have access to various learning resources available online. They can use computers, tablets, or smartphones to search for information, watch learning videos, or access interactive learning applications. Thus, students can learn independently by adjusting their pace and learning style. In addition, technology also allows students to organize and manage their learning time [13]. They can access learning materials anytime and anywhere, according to their needs. This flexibility allows students to plan their study time, set learning goals, and monitor their progress independently.

The development of learning independence in elementary school students is limited to direct learning in class and can also be done through story materials. Story materi-

al, such as story books or digital stories, can effectively develop student learning independence. Through story materials, students can develop their reading skills, comprehension, imagination, and creativity. They can read stories independently, interpret, analyze characters and storylines, and make conclusions and understanding. This process allows students to think independently, relate stories to their experiences, and develop critical thinking skills. So in previous studies, researchers have developed a culture-based electronic storybook that aims to increase the learning independence of elementary school students.

This book has been declared proper and valid by expert experts. However, this research is still limited to knowing the feasibility of electronic storybooks. The need for further studies to empirically determine the impact of electronic storybooks on the learning independence of elementary school students as a manifestation of the Pancasila student profile.

Previous researchers have never investigated this research. Existing research only examines the effect of interactive electronic storybooks on elementary school students' reading motivation [14]. This study states that using electronic storybooks can increase students' reading motivation. Research conducted by Liao et al. examines that engaging electronic storybooks can increase the enthusiasm for reading of kindergarten students [15]—Thompson et al.'s research. Those who studied the use of electronic storybooks were able to increase the focus of students with special needs [16]. Another study by Kao et al. studied that using electronic storybooks can increase students' motivation and reading comprehension ability [14]. Research conducted by Arifiyanti & Ananda also examines the use of electronic storybooks, which can increase the vocabulary of kindergarten students [17]. This statement is about the research gap and novelty research that researchers do. This study examines the effect of electronic storybooks on the learning independence of elementary school students. In addition, this electronic storybook was developed by combining elements of local Indonesian culture. So this study is different from other studies. Therefore, this study aimed to determine the effect of using electronic storybooks on the learning independence of school students

2   Method

This research is quasi-experimental research with a pretest-posttest design [30]. This research was conducted in a private school in West Sumatra. The research design used a pretest-posttest. This study used a purposive sampling technique to select 30 elementary school students as the experimental class (learning using electronic storybooks) and 30 elementary school students as the control class (learning using the control class). The independent variable in this study is electronic storybooks, and the dependent variable is the learning independence of elementary school students. The research instrument uses a questionnaire with a Likert scale. The data analysis technique used the normality test, the two variants similarity test, and the hypothesis test, which consisted of the two average difference tests, the effect test between variables, and the normalized gain test

3   Results and Discussion

Each class is given action according to the plan; for the experimental class, students are given action by teaching students to use electronic storybooks, while for the control class, students are given action by teaching conventional learning.

Table 1. Recapitulation of pre-test and post-test scores

Class	Pre-test	Post-test
Experiment Class	53,89	83,76
Control Class	53,83	65,33

The results of Table 1 shows that students in the experimental class have a higher average post-test score than students in the control class. After tabulating the data, the normality test is carried out using the normality test. The normality test results can be seen in the following table:

Table 2. Normality test results

Data	Class	X^2_{count}	X^2_{tables}	Criteria
Pre-test	Experiment Class	0.19	0.218	Normal
	Control Class	0.15	0.218	Normal
Post-test	Experiment Class	0.19	0.218	Normal
	Control Class	0.17	0.218	Normal

Based on Table 2, each class tested has a calculated X^2 value that is smaller than the X^2 table, so this proves that all data is normally distributed. After the normality test was carried out, the homogeneity test was carried out. The homogeneity test results can be seen in the following table:

Table 3. Homogeneity test results

Variance		F count	F table	Criteria
Experiment Class	**Control Class**			
108.76	123.76	1.24	3,232	Homogeneous

Table 3 shows that the calculated f value obtained is smaller than the f table, so it can be concluded that the data tested comes from the same variance. The next test is the T-test. The results of the T-test can be seen in the following table:

Table 4. The results of the two average difference tests

Class	Average	Variance	T count	T table	Criteria
Experiment	82.65	109,69	4,18	1.69	The average student learning independence of the experimental class is greater than that of the control class.

From Table 4, the calculation of the T-test shows that the t count obtained is greater than the t table. This result concludes that students in the experimental class (the class that learns using electronic storybooks) have higher learning independence than the control class, which learns using conventional learning. To find out the influence of the application of electronic storybooks on student learning independence, an influence test was carried out between variables. The results of the influence calculation can be seen in the following table:

Table 5. The results of the influence test between variables

Class	Average	rb	Conclusion	Criteria
Experiment	83,76	0.92	Positive Influ-	Tall
Control	65,33		ence	

From Table 5, the value of rb obtained is 0.83. This result proves that electronic storybook learning can influence elementary school students' learning independence. It can be done with the N-gain test to find out the magnitude of the effect. Calculation results of the N-gain test can be done with the following table:

Table 6. The results of the influence test between variables

Class	Pre-test	Post-test	N-Gain	Criteria
Experiment Class	53,89	83,76	0.64	Currently
Control Class	53,83	65,33	0.24	Low

Based on Table 6, it is stated that the increase in the learning independence of students in the experimental class is more significant than in the control class group, with the moderate improvement category in the experimental class and the low category increase in the control class. This result proves that electronic storybooks increase elementary school students' learning independence.

The results of this study are supported by research related to the use of other electronic storybooks. Research conducted by Fu et al. (2014) stated that learning reading strategies through electronic storybooks positively impacted students' reading performance. Students who participate in this study show increased reading ability [18]. Research conducted by Moody et al. (2014) also supports this finding stating that electronic storybooks are a tool to increase awareness of writing in preschool children who live in poverty [19]. This research shows that technology can be a valuable resource in helping children develop their literacy skills, especially in contexts with economic risks. Research conducted by van Dikjen (2023) states that the use of "print referencing" (referring to printed text) while reading e-storybooks on SMART boards to kindergarten children improves early literacy skills. This study aimed to explore the effect of using print referencing techniques in the context of reading e-storybooks on SMART boards on children's early literacy skills [20]. This research is also supported by the research of Skibbe & Plavnick (2018), which states that the type of text support provided in e-storybooks affects preschoolers' visual attention. Children tend to pay longer visual attention to the full text than to text that has been deleted or replaced

with words. These findings indicate that text support can influence children's interactions with text in e-storybooks [21]. Research conducted by Smeets et al. (2014) states that using e-storybooks effectively supports the learning of words in children with severe language disorders. Children showed significant improvement in vocabulary mastery after using e-storybooks. In addition, children also show a high level of satisfaction with using e-storybooks [22]. From the results of this study, using electronic storybooks has various benefits, such as increasing student involvement in the learning process, increasing student learning awareness, improving student literacy skills, and increasing elementary school students' vocabulary. A new finding for this research is that using electronic storybooks can increase the learning independence of elementary school students.

Learning independence is the ability of students to take full responsibility for their learning process [23]. Students who are independent in learning have the initiative to find and organize learning resources, manage their time efficiently, and evaluate their progress. They have high intrinsic motivation and can overcome challenges in learning. Learning independence is very relevant to the Pancasila student profile. In the Pancasila student profile, one of the elements contained in independence [21]. Independence in this context refers to the ability of students to take full responsibility for their learning process. Learning independence reflects values in Pancasila, such as respecting freedom, independence, and responsibility [22]. Students who are independent in learning develop the ability to regulate themselves, take the initiative, and take responsibility for their learning. They do not only rely on the teacher's instructions but are also active in finding learning resources, organizing time, and evaluating their progress.

By developing learning independence, elementary school students can become independent individuals with noble characters and awareness [24]. They learn to respect the freedom of themselves and others and understand the importance of being responsible for achieving learning goals. Independent learning also helps students to develop 21st-century skills, such as problem-solving, creativity, and initiative[25], [26]. In the Pancasila student profile context, independent learning provides a strong foundation for students to develop other Pancasila values, such as global diversity, cooperation, and critical thinking. Through learning independence, elementary school students can become independent individuals, open to differences, able to work with others, and can think critically to understand the world around them [27], [28]. Thus, the development of learning independence in elementary school students is very consistent with the values and goals of the Pancasila student profile. This condition helps students to grow and develop into independent, responsible, and competitive individuals in an ever-evolving era.

This condition increases learning independence and is caused by factors such as easy accessibility. Electronic storybooks can be accessed through electronic devices such as tablets, computers, or smartphones. With easy access, students can choose and read story books according to their interests and needs. They can study independently by accessing learning materials anytime and anywhere.

Interactivity is also the reason for increasing the learning independence of elementary school students. Electronic storybooks often have interactive features such as

sound, pictures, and animations that attract students' attention. This activity makes learning more exciting and interactive. Students can interact directly with storybooks, play sounds, move pictures, or answer story-related questions. This feature can encourage students' independence in understanding stories, develop reading skills, and encourage their interest in learning. Flexibility in learning settings also makes the electronic storybook factor able to increase the learning independence of elementary school students. The use of electronic storybooks allows students to set their own learning pace. They can repeat or speed up their reading, dig deeper into topics that interest them, or follow directions provided in the storybook. This flexibility allows students to tailor their learning according to their learning styles and needs.

In addition, the diverse content also makes the use of electronic storybooks increase the independence of learning. Electronic storybooks provide a variety of content that students can choose from. They can explore stories with different themes, genres, and difficulty levels. By choosing stories that they like or that interest them, students feel more motivated to learn and develop their independence in choosing reading material that suits their interests and level of ability. Multimedia also support electronic storybooks. Electronic storybooks provide multimedia support such as images, videos, or related links. This condition enriches students' learning experiences by providing additional information, visualizing concepts, or connecting stories to real-world contexts. This multimedia support can increase students' understanding, broaden their knowledge, and encourage independent exploration. By combining the advantages of technology with learning, electronic storybooks can provide an interactive, enjoyable, and independent learning experience for elementary school students. This condition helps them develop independent learning, increase interest in learning, and broaden their understanding of learning mathematics and in other subjects.

4 Conclusion

This study proves that t count > t table so that it can be concluded that the average student learning independence in the experimental class is more significant than that in the control class. The results of the study stated that using electronic storybooks had a practical effect on increasing the learning independence of elementary school students. This study recommends that teachers should be able to design indicators of learning independence that are suitable for elementary school students. The implications of this research can be used as a reference in increasing the learning independence of elementary school students.

References

1. W. Apriani and S. Khaulah, "The Influence of the AMONG System-based Mathematics Learning Model Towards the Students' Ability in Learning Independence at Elementary School Students," 2021.

2. T. Adi, "Developing Nearpod E-Media Through Model Discovery to Improve Learning Independence for Elementary School Students," *Uniglobal of Journal Social Sciences and Humanities*, vol. 1, no. 1, pp. 44–53, 2022, doi: 10.53797/ujssh.v1i1.7.2022.

3. D. E. Kusumaningrum, E. M. Budiarti, T. Triwiyanto, and R. Utari, "The Effect of Distance Learning in an Online Learning Framework on Student Learning Independence during the Covid-19 Pandemic," in *Proceedings - 2020 6th International Conference on Education and Technology, ICET 2020*, Institute of Electrical and Electronics Engineers Inc., Oct. 2020, pp. 182–185. doi: 10.1109/ICET51153.2020.9276564.

4. J. Siregar *et al.*, "The Role Of Pictures And Videos In The Learning Independence Of Elementary School Students," *Journal on Education*, vol. 05, no. 04, 2023.

5. D. Indah Saputri, "The Effect of the Spirit of Nationalism and Cinta Tanah Air on The Self Independence of Elementary School Students," *JMIE : Journal of Madrasah Ibtidaiyah Education*, vol. 4, no. 1, p. 2020, 2020, [Online]. Available: http://e-journal.adpgmiindonesia.com/index.php/jmie

6. Nurhayati, Jamaris, and Sufyarma Marsidin, "Strengthening Pancasila Student Profiles In Independent Learning Curriculum In Elementary School," *International Journal Of Humanities Education and Social Sciences (IJHESS)*, vol. 1, no. 6, pp. 976–988, Jun. 2022, doi: 10.55227/ijhess.v1i6.183.

7. A. Srirahmawati and A. A. Hunaifi, "Realizing Pancasila Student Profiles in the Elementary School with Learning Media Based on Local Wisdom 'Barongan Masks,'" *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran*, vol. 8, no. 2, p. 375, Jun. 2022, doi: 10.33394/jk.v8i2.4758.

8. Y. Hidayah and Y. Faisal Ali, "A Study on Interactive-Based Learning Media to Strengthen the Profile of Pancasila Student in Elementary School," 2021.

9. L. Chamisijatin, Y. Pantiwati, S. Zaenab, and R. F. Aldya, "The implementation of projects for strengthening the profile of Pancasila students in the implementation of the independent learning curriculum," *Journal of Community Service and Empowerment*, vol. 4, no. 1, pp. 38–48, Jan. 2023, doi: 10.22219/jcse.v4i1.24679.

10. Umar Seno, Sabar Narimo, Djalal Fuadi, Minsih, and Choiriyah Widyasari, "Implementation of Local Wisdom Based Learning in Realizing Pancasila Student Profiles in Elementary Schools," *Jurnal Ilmiah Sekolah Dasar*, vol. 6, no. 4, pp. 652–660, Dec. 2022, doi: 10.23887/jisd.v6i4.56041.

11. M. Jannah, L. D. Prasojo, and M. A. Jerusalem, "Elementary School Teachers' Perceptions of Digital Technology Based Learning in the 21st Century: Promoting Digital Technology as the Proponent Learning Tools," *Al Ibtida: Jurnal Pendidikan Guru MI*, vol. 7, no. 1, p. 1, Jun. 2020, doi: 10.24235/al.ibtida.snj.v7i1.6088.

12. D. G. H. Divayana, P. W. A. Suyasa, and N. K. Widiartini, "An innovative model as evaluation model for information technology-based learning at ICT vocational schools," *Heliyon*, vol. 7, no. 2, p. e06347, Feb. 2021, doi: 10.1016/j.heliyon.2021.e06347.

13. R. F. Kusumadewi, A. Neolaka, and M. Yasin, "Developing electronic teaching materials through comic mathematics media to increase student learning independence during the Covid-19 pandemic in Indonesia," *İlköğretim Online*, vol. 20, no. 1, pp. 708–716, Jan. 2021, doi: 10.17051/ilkonline.2021.01.61.

14. G. Y. M. Kao, C. C. Tsai, C. Y. Liu, and C. H. Yang, "The effects of high/low interactive electronic storybooks on elementary school students' reading motivation, story comprehension and chromatics concepts," *Comput Educ*, vol. 100, pp. 56–70, Sep. 2016, doi: 10.1016/j.compedu.2016.04.013.

15. C. N. Liao, K. E. Chang, Y. C. Huang, and Y. T. Sung, "Electronic storybook design, kindergartners' visual attention, and print awareness: An eye-tracking investigation," *Comput Educ*, vol. 144, Jan. 2020, doi: 10.1016/j.compedu.2019.103703.

16. J. L. Thompson, J. B. Plavnick, and L. E. Skibbe, "Eye-Tracking Analysis of Attention to an Electronic Storybook for Minimally Verbal Children With Autism Spectrum Disorder," *Journal of Special Education*, vol. 53, no. 1, pp. 41–50, May 2019, doi: 10.1177/0022466918796504.

17. N. Arifiyanti and K. Ananda, "PRODUKSI KOSAKATA ANAK MELALUI ELECTRONIC WORDLESS PICTURE STORYBOOK," *RETORIKA: Jurnal Bahasa, Sastra, dan Pengajarannya*, vol. 11, no. 2, p. 101, Aug. 2018, doi: 10.26858/retorika.v11i2.6405.

18. Y. J. Fu, S. H. Chen, C. S. Wey, and S. C. Chen, "The effects of reading strategy instruction via electronic storybooks on EFL young readers' Reading Performance," *International Journal of Contemporary Educational Research*, vol. 1, no. 1, pp. 9–20, 2014.

19. A. Moody, L. Skibbe, M. Parker, and A. Jones, "Use of Electronic Storybooks to Promote Print Awareness in Preschoolers who are Living in Poverty," *Journal of Literacy and Technology*, vol. 15, no. 3, 2014.

20. M. J. van Dijken, "Print referencing during e-storybook reading on a SMART board for kindergartners to promote early literacy skills," *Read Writ*, vol. 36, no. 1, pp. 97–117, Jan. 2023, doi: 10.1007/s11145-022-10304-3.

21. L. E. Skibbe, J. L. Thompson, and J. B. Plavnick, "Preschoolers' Visual Attention during Electronic Storybook Reading as Related to Different Types of Textual Supports," *Early Child Educ J*, vol. 46, no. 4, pp. 419–426, Jul. 2018, doi: 10.1007/s10643-017-0876-4.

22. D. J. H. Smeets, M. J. van Dijken, and A. G. Bus, "Using electronic storybooks to support word learning in children with severe language impairments," *J Learn Disabil*, vol. 47, no. 5, pp. 435–449, Sep. 2014, doi: 10.1177/0022219412467069.

23. F. S. Arista and H. Kuswanto, "Virtual physics laboratory application based on the android smartphone to improve learning independence and conceptual understanding," *International Journal of Instruction*, vol. 11, no. 1, pp. 1–16, Jan. 2018, doi: 10.12973/iji.2018.1111a.

24. J. Jupriyanto, N. Nuridin, and L. Ariani, "Implementation of the Independent Learning Curriculum in Profil Pelajar Pancasila of Elementary School Students," *Dwija Cendekia: Jurnal Riset Pedagogik*, vol. 7, no. 1, pp. 380–391, 2023.

25. C. E. Fajrin, S. W. W. Ningsih, Kartini, A. Saputra, U. Khoiriyah, and M. Duma, "Student and Teacher Collaboration in Developing STEM-Based Learning Modules and Pancasila Student Profiles," *JPI (Jurnal Pendidikan Indonesia)*, vol. 12, no. 1, pp. 39–49, Mar. 2023, doi: 10.23887/jpiundiksha.v12i1.52704.

26. A. A. Syafriza, "The implementation of Discipline Character Values in Growing Independent Learning During the Pandemic Covid-19 Pandemic," *Indonesian Journal of Elementary Teachers Education*, vol. 2, no. 2, pp. 83–94, 2021, doi: 10.25134/ijete.v%vi%i.5326.

27. H. Yanzi, E. El Faisal, A. Mentari, R. Rohman, and E. Seftriyana, "Analysis of the Implementation of the Pancasila Student Profile Strengthening Project (P5) in Junior High School Category of the Independent Changed Bandar Lampung City," *Jurnal Pendidikan Progresif*, vol. 12, no. 3, pp. 1423–1432, 2022, doi: 10.23960/jpp.v12.i3.202232.

28. E. V. Intania and S. Sutama, "The role of character education in learning during the COVID-19 pandemic," *Jurnal Penelitian Ilmu Pendidikan*, vol. 13, no. 2, pp. 129–136, Nov. 2020, doi: 10.21831/jpipfip.v13i2.32979.