


The Effectiveness of the e-Wetland Book Integrated Reading-Questioning-Answering for Geography Learning in Wetland Environments

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ARTICLE INFO	ABSTRACT
<p>Article History: Received: 2025-10-06 Accepted: 2026-01-06 Published: 2026-03-30</p> <p>Keywords: answering; effectiveness; questioning; reading; wetland;</p> <p>Corresponding author: Nevy Farista Aristin Email: nevyfarista@ulm.ac.id DOI: 10.37905/jgej.v7i1.34737</p> <p>Copyright © 2026 The Authors</p>  <p>This open access article is distributed under a Creative Commons Attribution-NonCommercial (CC-BY-NC) 4.0 International License</p>	<p>Students' knowledge of wetland concepts is quite diverse due to the very complex presentation of wetland material. This is one of the primary challenges in the geography learning process in the era of Education 4.0, particularly in the Regional Development Geography course. Learning components that incorporate the use of learning resources and the selection of appropriate learning strategies, integrated with technology, play a crucial role in improving and maintaining students' knowledge in the long term. To address this challenge, it is essential to develop a digital book on wetlands that integrates Reading-Questioning-Answering (RQA). The purpose of this study was to measure the effectiveness of the E-Wetland Book Integrated RQA in improving wetland area development knowledge among students at Lambung Mangkurat University. The subjects were 30 students taking the Regional Development Geography course in the Geography Education Study Program at Lambung Mangkurat University, as all students had relatively similar reading and cognitive literacy skills. This study employed a pre-experimental design with a one-group pretest-posttest-only design. The analysis used a paired sample t-test. The e-wetland book, which integrates RQA, enables students to learn about wetland development related to tourism, settlements, transportation, and agriculture in South Kalimantan. The implementation of the e-wetland book, integrated with RQA during classroom learning activities, can enhance students' knowledge, critical and creative thinking skills, speaking abilities, and overall learning outcomes. The implications of developing an e-wetland book integrated with RQA can provide an alternative approach to digital learning resources and effective learning strategies, thus improving student learning outcomes and the quality of learning in the digital era.</p>
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1. Introduction

The growth of science and technology has a reciprocal relationship that affects the advancement of Education 4.0. This education makes lecturers central to technology use. Education plays a crucial role in producing competent and competitive human resources in Education 4.0. The growth of science and technology has a reciprocal relationship with educators. This is supported by the fact that science provides the materials and theories for developing technology, while technology serves as a medium for disseminating the results of scientific research (Mulyadi, M. A. Y., et.al 2025). Knowledge and technology are integrated to improve the quality of education and enhance the effectiveness of educational practices (Maryati et al., 2024; Xing & Xianping, 2023). The quality of education is influenced by the quality of the human resources produced, as seen from their mastery of technology, skills, and extensive knowledge supported by professional expertise.

Achieving quality education is supported by quality learning, which is inseparable from the implementation of learning components. These learning components include objectives, learning media, learning strategies, learning resources, learning methods, and lecturer capabilities (Riza & Barrulwalidin, 2023). Such as the role of lecturers as sources of knowledge who maximize technology as an intermediary media in producing competent and competitive human resources. Therefore, learning components must be optimally implemented across all courses, leveraging lecturer capabilities to achieve quality learning. One example is the regional development geography course in the Department of Geography Education. This course examines wetland development, which requires the lecturer's capabilities and learning technology to improve the quality of wetland learning.

Geography lessons in this regional development course cover the development of wetland environments. Wetlands are a unique ecosystem characteristic of Southern Kalimantan. Wetlands play a crucial role in maintaining the environment and encompass hydrological, ecological, and socioeconomic aspects. Wetland ecosystems play a crucial role in mitigating climate change and reducing the risk of natural disasters & (Nyirangirimana Nyandwi, 2024; Sarkar et al., 2024). Sustainable wetland management is a crucial step toward achieving sustainable development goals, particularly by enhancing the socio-ecological balance and promoting economic growth (Kundu et al., 2024). Wetlands also provide significant opportunities for sustainable development. Therefore, it is necessary to increase students' understanding of the importance of wetland management and development through the learning process in geography courses on regional development.

Based on the observation results, it was found that the challenges in learning geography in the regional development geography course in the Geography Education Study Program at Lambung Mangkurat University were students' diverse conceptual knowledge about wetland development (78%) and low willingness to read (80%). In addition, there is a lack of learning resources for wetland development based on case studies in South Kalimantan to support the geography course of regional development.

The digital learning resource used to support regional geography development is the e-wetland book, a digital reference book that can facilitate students' understanding of the material. A digital reference book is a non-printed book in a digital form that is systematically compiled to facilitate independent learning through technology, allowing students to access it anytime and anywhere (Mashfufah et al., 2019; Nicholas & White, 2012). The e-Wetland book contains material on wetland areas in South Kalimantan to facilitate students' understanding of wetland concepts. Through this e-wetland book, it is hoped that students will develop effective learning methods, not focusing solely on taking notes from lecturers, incorporating diverse learning styles in line with their personalised learning, and improving their reading literacy.

In addition to developing a digital wetland book, appropriate learning strategies should be implemented in regional geography development lessons. Constructivist-based learning strategies are among the processes used to build students' knowledge. This reinforces the fact that constructivism is a foundation for thinking with a contextual approach in which knowledge is built gradually and results are expanded within a limited context (Sumarna & Gunawan, 2022). Knowledge is then given meaning through real experience (Nafisah et al., 2024). One constructivist-based learning strategy is RQA. (Sumampouw, 2013). The RQA strategy is a learning strategy consisting of three stages: reading, questioning, and answering. Implementing the RQA strategy trains students to read critically and to understand the content of the text, enabling them to identify key ideas and build a deeper understanding of the concepts being studied. The RQA strategy encourages students to read diligently, understand the content, and identify the most important parts (Tasa et al., 2021). It also involves asking, answering, and presenting questions (Leasa et al., 2023).

Some previous studies have focused only on the development of digital textbooks (Aristin et al., 2020, 2025; Nuryuliani et al., 2024), the use of RQA learning strategies in science learning, and the integration of RQA with problem-based learning (Bahri & Corebima, 2019; Kasim et al., 2024; Leasa et al., 2023; Rompegading et al., 2022). However, there remains a lack of research on integrating e-wetland books and RQA strategies into geography learning, particularly in conjunction with materials for wetland area development. Therefore, this study is expected to fill a gap in geography learning innovation, both in digital learning resources, such as e-wetland books, and learning strategies, such as the RQA strategy. Therefore, this study aims to analyse the effectiveness of the e-wetland book, integrated with the reading-questioning-answering strategy, in geography learning within wetland environments as an innovative solution to overcome these challenges.

2. Method

This study emphasises the practical utility of these results in an educational context. This study used quantitative methods to assess the effectiveness of an e-wetland book integrated with the RQA strategy to improve students' knowledge of wetland environments. This section describes the research design, data collection, instruments, and data analysis used to achieve the research objectives.

This study analysed the effectiveness of an e-wetland book integrated with the RQA strategy in geography learning within wetland environments. This research was conducted with several considerations, including the limited availability of digital reference books on wetland area development, low student reading literacy, and the lack of lecturers who implement learning that integrates the e-wetland book and RQA strategy to improve knowledge of wetland area development. The innovation of integrating digital books and learning strategies combines theory, design, and practice.

2.1. Research Design

This study was conducted at the Geography Education Study Program, Faculty of Teacher Training and Education, Lambung Mangkurat University. The subjects were students enrolled in a regional development geography course during the odd semester of the 2025/2026 academic year. The sample comprised 30 students from 2022. Moreover, the selected students represented a relatively homogeneous group, as they had similar reading and cognitive literacy skills. This is in line with previous research, which concluded that a sample size of 20–40 participants is practical and reasonable for educational research, such as formative evaluation, learning behaviour, and student engagement (Besekar et al., 2024; Dessie et al., 2023; Hertzog, 2008). The study used a preexperimental, one-group, pretest-posttest design (Table 1). The one-group pretest-posttest-only design is an experimental study conducted on a single group with similar characteristics, thereby eliminating the need for a homogeneity test.

Table 1. Product implementation design for users

			Internal Validity						External Validity			
			History	Maturation	Testing	Instrumentation	Regression	Selection	Mortality	Interaction of testing and X	Intercation of selection and	Reactive Arrangements
One-Group Design	Pretest	Posttest	-	-	-	-	?	+	+	-	-	?
0	X	0										

Source: (Campbell & Stanley, 1963)

The rationale for choosing this design is that it is part of a project entitled “Development of Integrated Reading-Questioning-Answering Learning Resources for Geography Learning in Wetland Environments”; therefore, the article “The Effectiveness of the e-Wetland Book Integrated Reading-Questioning-Answering for Geography Learning in Wetland Environments” focuses on the effectiveness test of the initial prototype. The results of this effectiveness test provide an initial overview of the product's quality for further development on a wider scale.

The one-group Pretest-Posttest design is the simplest experimental design and has several weaknesses, including internal validity. However, to reduce the effectiveness of bias, learning instructions are designed to maximise the digital learning space accessible anytime and anywhere by students. The assumption underlying threats to internal validity, “selection,” is that all participants have equal access to digital learning resources. This assumption ensures that student learning outcomes are indeed the result of the designed treatment, rather than due to unequal subject abilities to access learning resources.

Treats to internal validity, “mortality,” ensured that all participants followed all the learning instructions to completion. This assumes that there would be no boredom in the learning process caused by excessively long instructions. All risks related to participant inaccessibility, student turnover, or absence were anticipated at the beginning of the treatment, ensuring that all 30 students assigned to the test group completed the session. More complex testing to mitigate threats to internal validity included

history, maturation, testing effects, instrumentation, and statistical regression, as well as external validity, which was conducted in the advanced development stage.

The research procedure was based on a learning instruction design (Table 2), comprising three meetings. Each meeting included three learning stages: independent learning, guided learning, and assignments. Therefore, it was assumed that all the students had an equal understanding of the learning content.

Table 2. Learning Instruction Design e-Wetland Book Integrated Reading-Questioning-Answering

Learning Instruction	Stage	Duration	Information
1st Meeting	Learn to be Independent	60"	Access the SIMARI platform to view learning topics and download the materials provided.
	Guided Learning	50"	Pretest Providing study instructions and introductory materials
	Assignment	60"	Independent learning assignments through the SIMARI platform
2nd Meeting	Learn to be Independent	60"	Reading e-wetland book (Reading)
	Guided Learning	50"	Guided Learning, Discussion, and Q&A (Questioning)
	Assignment	60"	Self-study assignments to answer case studies (Answer)
3rd Meeting	Learn to be Independent	60"	Reading e-wetland book (Reading)
	Guided Learning	50"	Guided Learning, Discussion, and Q&A Posttest
	Assignment	60"	Make reflections and learning conclusions

The reading-questioning-answering (RQA) approach was implemented to maximise independent learning activities and student assignments before or after class. Students were given a pre-test before material on wetland development was presented in the first meeting. They were then given an e-wetland book with integrated RQA in the second meeting. In the third meeting, students engaged in discussions and Q&A sessions and subsequently took a posttest. The SIMARI platform was also used throughout the learning process from the first to the third meetings. The instrument used was a set of essay questions for the pre-test and post-test, which were administered through the SIMARI ULM e-learning platform. This design aimed to build students' responsibility for their learning.

2.2. Data analysis

Data collection techniques included initial field observations, pretests, posttests, and interviews with students taking a Regional Development Geography course. The initial observation process related to students' reading literacy in the Regional Development Geography course was descriptively analysed. Essay questions were used in the pre-test and post-test stages. The results of the essay questions were analysed quantitatively to evaluate their effectiveness. Furthermore, they were supported by data, such as photo documentation collected during the implementation of the e-wetland book, which was integrated with RQA during the learning process.

This study proposes an analytical hypothesis to determine the effectiveness of e-wetland book-integrated RQA.

This study has the following hypotheses:

H_0 : The e-wetland book integrated reading-questioning-answering strategy is not effective in enhancing knowledge of wetland area development.

H_1 : The e-Wetland book integrated with the reading-questioning-answering strategy is effective in enhancing knowledge of wetland area development.

To test this hypothesis, a normality test, such as the Shapiro–Wilk test, was required. The Shapiro–Wilk test was selected because the sample size was less than 50. Furthermore, the analysis used a paired-samples t-test, with the criterion that if Sig. (2-tailed) < 0.05, H_1 was accepted.

3. Results and Discussion

The Shapiro–Wilk test was used to determine the correct analysis. The results of the normality tests are presented in Table 3.

Table 3. Normality test results

Mark		Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistics	df	Sig.	Statistics	df	Sig.
Mark	Pretest	.137	30	.157	.943	30	.112
	Posttest	.114	30	.200*	.941	30	.097

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The Shapiro-Wilk test indicated that the significance value for the pre-test value was .112 and that for the post-test value was .097. Therefore, it can be concluded that the data are normally distributed because the p-values for the pre-test and post-test are greater than 0.05. These results serve as the basis for evaluating the effectiveness of e-wetland book-integrated RQA in geography learning within wetland environments.

Based on the results of the normality test, the analysis in this study employed a parametric approach, specifically the paired-samples t-test. Using the paired-samples t-test, the differences in pretest and posttest scores (Table 4), pretest-posttest correlation (Table 4), and hypothesis test (Table 6) were obtained as follows:

Table 4. Results of the pretest and posttest difference test

		Paired Samples Statistics			
		Mean	N	Standard Deviation	Std. Error Mean
Pair 1	Pretest	49.43	30	16.856	3.077
	Posttest	73.10	30	5.006	.914

Based on the output results in Table 4, the descriptive statistical results are shown, namely, the pre-test and post-test scores. The average pre-test score was 49.43, while the post-test score obtained an average learning outcome of 73.10. This means that the average pretest learning outcome score was 49.43 < posttest 73.10; descriptively, there is a difference in the average learning outcomes between the pre-test and post-test.

Table 5. Correlation test results

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	Pretest & Posttest	30	.531	.003

Table 5 presents the results of the correlation test between the pre- and post-test scores, with a significance level of Sig. value of .003. Therefore, it can be concluded that there is a relationship between the pre- and post-test scores, as indicated by the Significant Difference. value of .003 < 0.05.

Table 6. Hypothesis test results

		Paired Samples Test					t	df	Sig. (2-tailed)
		Paired Differences							
		Mean	Standard Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest- Posttest	-23.667	14.819	2.706	-29.200	-18.133	-8.747	29	.000

The results of the paired-samples test indicated that the Sig. (2-tailed) value was $.000 < 0.05$, indicating that H_1 was supported. Therefore, it can be concluded that the e-Wetland book, integrated with the reading-questioning-answering strategy, is effective in enhancing knowledge of wetland area development.

The challenge faced by education in Indonesia is evident in its declining literacy rate. This is evident in students' lower levels of interest in geographical literacy (Kamil et al., 2020; Ridha et al., 2019). This low geographical literacy rate is caused by factors such as limited access to high-quality reading materials, a shortage of geography books as teaching materials, and inappropriate contextual books and learning methods for students' needs. This low literacy rate is also caused by factors such as limited access to high-quality reading materials, a shortage of books as teaching materials, and learning methods that are not suitable for students' needs. This condition is also evident among geography education students, who still experience limited access to relevant books on wetland environmental development, both printed and digital, in the Department of Geography Education reading room. Based on interviews with several students, it was found that students' preferences in reading textbooks are shifting toward e-books; thus, they need digital textbooks to support their geography learning.

One form of technological innovation in geography learning that addresses this challenge is digital textbooks. The availability of digital textbooks offers significant opportunities to improve student literacy. Digital textbooks are more accessible than printed textbooks, including digital geography books. Students can download and read course materials anytime and anywhere using devices such as laptops, mobile phones, or tablets. Learning supported by digital textbooks also makes it easier for students to develop knowledge from a wide range of digital reference sources. Therefore, the use of digital geography textbooks contributes to students' literacy levels by reducing barriers to knowledge acquisition and improving their critical reading, analytical, and reasoning skills. This aligns with previous research showing that digital geography books are effective in improving students' literacy skills and reading interests (Tarigan et al., 2024), thereby creating a responsive learning environment (Abdimanapov et al., 2025).

Digital books can be used from elementary to higher education to improve the quality of learning. This aligns with the statement that digital textbooks are an alternative learning resource in various educational institutions, from elementary to higher education (Ansya et al., 2024). Digital books offer the advantage of easy access to materials that can be read anywhere and anytime. Furthermore, they offer interactive features that provide a more in-depth learning experience than conventional textbooks (Tarigan et al., 2024; Wulandari et al., 2024). This affects students' learning, increasing their motivation to read and learn more about the material.

Geography learning in the Department of Geography Education, Faculty of Teacher Training and Education, Lambung Mangkurat University, particularly in the regional development geography course, has identified problems with students' literacy skills, knowledge, and learning outcomes that remain low. This is because resources for geography learning in wetland environments are still limited, both digitally and conventionally. Therefore, this study produced a digital book on wetlands. This book is the result of the development of digital learning resources for wetland area development in South Kalimantan. This book was developed to support the learning of wetland environmental geography for geography education students and related fields, both in wetland and non-wetland areas.

The e-wetland book is a digital learning resource in the technology era that plays a vital role in supporting the learning of regional development geography courses. This book is compiled from case studies of the city of Banjarmasin, which has wetland characteristics. In addition, this book provides a comprehensive picture of the relationships among the physical characteristics of wetlands, social factors including human activities, and wetland area development policies in South Kalimantan. The material in this book concerns the concept of wetlands and their development from a geographical perspective, including aspects of tourism, transportation, agriculture, local economy, and riverbank communities. Through the e-wetland book, students not only understand the material theoretically but also in the context of real wetland areas. During learning, they can analyse and interpret data to formulate decisions based on the case studies described in the book. Compared with previous studies (Aristin et al., 2020, 2025; Bahri & Corebima, 2019; Kasim et al., 2024; Leasa et al., 2023; Nuryuliani et al., 2024), it can be concluded that the development of this integrated RQA e-wetland book is based on the

characteristics and potential of wetlands in South Kalimantan from a geographic perspective. This allowed students to gain a contextual understanding of wetland development from a geographical perspective, thereby strengthening their knowledge. Furthermore, the e-Wetland Book enhances learning quality. This is reinforced by the statement that technology-based learning greatly enhances access to digital materials, thereby improving the quality of learning (Putra et al., 2021).

Enhancing students' knowledge of geography education is supported not only by the availability of digital books, such as e-wetland books, but also by appropriate learning strategies. E-wetland books should also be integrated with constructivist learning strategies. One of these strategies is the reading-questioning-answering (RQA) strategy. The RQA learning strategy consists of three stages. The first stage involves reading and understanding the implied and explicit content of the text. The reading stage of the RQA strategy assigns students to read the wetland book uploaded to the SIMARI ULM. This reading activity enables students to explore information and activate prior knowledge, including factual knowledge, which serves as the foundation and initial understanding of learning activities (Ningsih & Retnowati, 2020; Setiorini et al., 2022; Wahyuni & Rahayu, 2023). This helps students understand the content of the material, identify the main ideas, and engage in thinking, metacognitive, and visual activities (Suhaila et al., 2025). It can thus be concluded that reading activities during the learning process help students build meaning and communicate and interpret information, both implied (through inference) and explicit (as facts), thereby enhancing their understanding.

Questioning is crucial for constructivist learning. At this stage, students can be trained to formulate questions regarding the material they have read. This requires students to ask critical and analytical questions to foster their cognitive development (Huda, 2022; Shukhratovich, 2024; Wang et al., 2025). This stage also helps students with difficulty expressing their ideas and thoughts by writing them as questions. This is supported by the fact that creating critical questions is integral to the thinking process, thereby developing students who are capable of solving problems (Prakong, 2024; Švecová et al., 2025).

Subsequently, in the answering stage, students were allowed to find answers to the questions. This stage allows students to process material information, draw conclusions, and generate appropriate answers. This is a crucial part of RQA because students repeatedly process information in the material, thereby improving their understanding and storing it in long-term memory (Mapurunga & Carvalho, 2018). Additionally, in this stage, students can enhance their speaking skills, express thoughts, ideas, and opinions, and defend their opinions (Muzammil et al., 2024).

This RQA focuses on students constructing their own knowledge through their learning experiences. This allows students to actively engage in independent group learning, thereby improving their understanding of what they have learned (Palenti et al., 2023). Through RQA, students can discover and comprehend the content of the reading material, thereby helping them understand the material taught by the lecturer. RQA is a new learning strategy designed to optimally construct knowledge. This is an appropriate learning strategy for empowering students with varying academic abilities. The advantages of this RQA strategy include its ability to stimulate student engagement and improve academic achievement (Ardini et al., 2022; Nasrudin & Azizah, 2019), improve learning outcomes (Kasim et al., 2024), and enhance thinking skills through discussions and independent question-and-answer. The advantage of the RQA strategy is that it makes learning more engaging through independent studies, thus making it easier to remember and understand. This aligns with previous research showing that RQA can improve cognitive learning outcomes for students with high and low academic abilities (Rompegading et al., 2022).

Implementing the e-wetland book in the regional development geography course in accordance with the RQA learning instructions introduced a novel learning innovation to improve students' knowledge. This aligns with previous research findings suggesting that the use of RQA has implications for concept mastery (E. I. Putri et al., 2022). The learning instructions during the RQA and e-Wetland Books included independent study, guided learning, and assignments via the SIMARI e-learning platform. SIMARI is a platform for all ULM information system applications. SIMARI ULM has an online learning platform called e-learning, which is used by lecturers and students. Therefore, lecturers and students can use the platform anywhere and at any time. Therefore, the learning activity implemented through the e-wetland book integrated RQA across three e-learning sessions.

The first meeting conducted a pre-test to assess students' initial knowledge of wetland area development in South Kalimantan. It was found that knowledge of wetland area development remained

low, and that there were various wetland concepts. In addition, students' reading literacy was low. The lecturer then presented introductory material to the students on the development of wetland areas from the perspectives of transportation, settlements, riverbank communities, wetland tourism, and wetland agriculture in southern Kalimantan. The students were also assigned independent assignments using the SIMARI platform. The independent assignment given by the lecturer was to read an e-wetland book. This assignment aimed to motivate students' interest in reading during the learning process.

In the second meeting, the students continued reading the e-wetland book until the final chapter. This reading activity was not just about reading; the students had to understand and analyse the development of wetland areas in each chapter. In the reading activity, some students were still reading Chapter 3, while others had completed the e-wetland book. Through this reading activity, the students evaluated the information presented and connected ideas from various sources. This allowed the students to understand the material in depth and engage in critical thinking. In this second meeting, students who had finished reading were asked verbal questions by the lecturer to determine their level of understanding of the material in the book. If students were still unable to answer the questions correctly, they could repeat the e-wetland book reading activity. In addition, to strengthen the students' concepts, independent assignments were given to address case studies via the SIMARI e-learning platform. This assignment aimed to allow students to practice independently in identifying and overcoming the problems they encountered in learning.

The third meeting of the regional development geography lesson continued students' reading of the e-wetland book. However, in this meeting, the students were given the opportunity to discuss and ask questions through guided learning, with the lecturer acting as a facilitator. This discussion demonstrates the level of understanding and mastery of the material on wetland areas in South Kalimantan. The students not only described basic concepts but also provided examples and solutions to problems related to wetland areas. Through this discussion activity, the students were trained to communicate, share comments, and offer opinions based on the material they read. In addition, during the third meeting, the students were assigned to compile reflections and conclusions. This activity trained the students to evaluate various arguments and viewpoints so that they could conclude the material appropriately. At the end of the third meeting, the students were given a post-test to determine the increase in knowledge during the wetland development learning process over three meetings using the e-wetland book and RQA strategy.

The e-wetland integrated RQA implemented through SIMARI e-learning ULM enables students to become independent learners. This e-learning platform also makes it easier for students to apply e-wetland book-integrated RQA at any time and from anywhere. Technology can improve accessibility and personalised learning (Hossain, 2025; Tasneem et al., 2025). This innovation can increase students' willingness to read, ask questions, and share ideas with each other. This is reinforced by the fact that students practice communicating by reading, asking questions, and providing opinions and comments to their peers (Hanh & Ngan-Ha, 2023).

The integration of the e-wetland book and RQA learning strategy is the latest integration in geography learning to improve students' knowledge. This study found that the e-wetland book integrated with RQA is effective for learning geography in wetland environments. This was evident in the increase in student knowledge, as measured by learning outcomes, which significantly improved after treatment. This aligns with previous research findings suggesting that integrating technology and knowledge through learning strategies, innovative resources, and effective methods can enhance teaching and learning processes (Hatamleh & Hatamleh, 2024).

Furthermore, integrating e-wetland books and RQA enables the development of new knowledge and experiences in learning, allowing students to develop a conceptual understanding of the material being studied (Sholihah et al., 2025). To enable students to enhance their critical and creative thinking skills and solve problems in wetland environments. This aligns with the statement that knowledge is built through real-world experiences, active involvement, and connecting new information with prior knowledge (Andrews et al., 2023; Conrad, 2022; Mugambi, 2018), which can create a dynamic learning environment and critical thinking skills in the world of education (AS Putri et al., 2024). For educators, integrating digital textbooks and RQA is the right choice to continuously strengthen students' skills, such as critical thinking, communication, and creativity, throughout the learning process. This research offers a new theoretical perspective on sustainable development education through the RQA constructivist

learning strategy and digital textbooks. The novelty of these research findings fills a gap in the field of geography learning innovation, which aims to achieve educational quality. Thus, this study contributes to the understanding of the practice of innovative learning strategies and learning resources in higher education.

4. Conclusion

Based on the analysis, this research concludes that the e-wetland book, which integrates reading-questioning-answering, is effective for geography learning in wetland environments. The e-wetland integrated RQA is capable of building contextual knowledge in geography learning. For educators, this is the ideal choice to continuously strengthen critical thinking, communication, and creative skills throughout the geography learning process. Theoretically, this research provides a new perspective on sustainable development education through the RQA constructivist learning strategy and digital textbooks. The research limitation is the implementation of the e-wetland book-integrated RQA to test its effectiveness using a before-and-after observation design to assess the acquisition of wetland environmental knowledge. Thus, this research also contributes to innovation in geography learning, specifically regarding the practice of learning strategies and the use of learning resources in higher education.

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AI Use Declaration. The authors used Grammarly: AI Writing App, version 9.89.0 for language editing. The authors reviewed and edited all AI-assisted outputs, and we are fully responsible for their content and any errors.

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