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The Development of Digital E-books to Improve Students' Creativity Skills: A Self-Regulation Strategies Approach

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Creativity is the main skill needed by students in online learning. However, student creativity is difficult to develop independently during online learning because students may not focus on studying at home, and digital teaching materials still need to support students' self-regulation skills to be creative in learning. Therefore, online learning requires digital media to support students' self-regulation abilities in creating independently, namely the development of e-book digital media. This study aims to develop valid, practical, and effective digital e-books to improve students' creativity and self-regulation abilities. This type of research is research and development (R&D) with the Plomp model (2007), which consists of three stages: the preliminary research stage, the development or prototyping stage, and the assessment stage. The participants in this study were 78 elementary school students in Probolinggo, Indonesia. Data analysis used the validity test and practicality test through descriptive statistical analysis of the mean and the effectiveness test through Mann-Whitney test analysis. The results showed that the product was valid, practical, and effective in improving students' creativity and self-regulation abilities. This research is important because it contributes to developing digital-based creative learning products in online learning for educators worldwide.

Keywords: creativity skills, development, digital E-book, online learning, self-regulation

INTRODUCTION

Self-regulation ability is an important skill for students to solve creative problems in online learning. Self-regulation ability increases students' motivation and cognitive and self-regulation processes in online learning (Jayawardena et al., 2019). Every student must master self-regulation ability because self-regulation ability supports all their activities and learning online (van Alten et al., 2020). Self-regulation ability provides a meaningful learning experience for students, fosters an open perception, and can create problem-solving strategies (Babakhani, 2014). Self-regulation learning experiences can improve students' visual understanding and cognitive construction in online learning (Jivet et al., 2020).

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However, students' self-regulation skills tend to be low during online learning. Research by Muwonge et al. (2020) showed that 66 of 527 students still experienced difficulties in mastering self-regulation abilities, so their learning achievements were not good. Students with low self-regulation abilities tend to have passive behavior unsuitable for online learning (Chen & Li, 2021). On the other hand, students' self-regulation abilities in online learning can only be improved if they are willing to actively construct knowledge according to learning objectives, manage their learning process, and evaluate their performance results (Xiao & Yang, 2019). In addition, improving students' self-regulation abilities requires a long time (Hong et al., 2021; Lucieer et al., 2016). Therefore, online learning requires intervention to improve students' self-regulation abilities.

A good intervention to improve self-regulation abilities in online learning is the use of digital media. Granberg et al. (2021) stated that the intervention of digital media devices triggers students' self-regulation abilities in online learning. This is in line with (Li et al., 2020); students' self-regulation abilities increase to obtain new solutions through adaptive interventions from the development of computer-based digital media. Learning digital media can increase students' motivation to develop self-regulation skills and find new ideas (Yuli. L. Chen & Hsu, 2020). Research by Tsai & Shen (2009) also states that the development of digital media can motivate students to increase their self-regulation abilities so that student achievement increases. Muis et al. (2015) proved that students' self-regulation abilities increased with digital technology. Meanwhile, research by Van Alten et al. (2020) uses digital media with the school's digital homework system so that students manage their learning processes independently so that their cognitive abilities and creative thinking increase. Therefore, digital media is an alternative solution to increase student creativity.

The use of digital media products helps improve students' creativity in online learning (Tønnessen et al., 2021). The development of digital media products in the form of text can increase students' understanding and creativity (Songkram, 2015). Thoring et al. (2018) stated that the creative environment in online learning could be formed by reading a lot of digital textbooks. Digital E-book reading in online learning positively influences the acquisition of meaningful information and increases students' higher-order thinking (Liu et al., 2020). Books in digital literacy can improve students' understanding of information and develop reading comprehension skills in computer-based online learning (Techataweewan & Prasertsin, 2018). In addition, innovatively developed digital e-books can build personal motivation, expand knowledge developed online and find creative ideas (Bell et al., 2014). Thus, digital e-books have become a digital innovation solution that attracts students' creativity and learning motivation (Watanabe et al., 2018).

Overall, the use of digital e-books supports students' self-regulation abilities for creativity during online learning. The use of digital e-books effectively increases students' self-regulation abilities to discover new ideas (Granberg et al., 2021). Regular use of digital e-books can improve academic performance and foster student creativity and self-regulation abilities (Moundy et al., 2021). Research by Garach-Gómez et al.

(2021) stated that the intervention with the e-book reading approach was the development of new and creative learning strategies. Digital e-books play a role in increasing the academic achievement, creativity, and self-regulation of students in their learning process (Alsalhi et al., 2020; Zare et al., 2016). Thus, digital e-books can increase students' creativity and self-regulation abilities.

However, digital e-books can also hinder students' creativity and self-regulation abilities. The previous research from Kirby & Anwar (2020); Shim et al. (2016); Wang & Bai (2016) states that using e-books in text form can reduce students' interest and motivation to learn, inhibiting creativity and students' self-regulation abilities. On the other hand, well-designed and creative digital e-books can enhance their creativity, self-regulation abilities, and understanding of concepts (Grolig et al., 2020; Sanina et al., 2020). This shows that there are contradictions regarding the use of digital e-books on increasing students' creativity and self-regulation abilities. Therefore, this research wants to develop a digital e-book to test students' creativity and self-regulation abilities during online learning. This research is important because it contributes information to educators or teachers about the creation and development of digital e-books that are valid, practical, and effective in increasing students' creativity and self-regulation abilities.

Research Objectives and Research Questions

This study aims to develop valid, practical, and effective digital e-books to improve students' creativity and self-regulation abilities. Thus, this research question is explained in detail as follows.

1. Are digital e-book products valid for improving students' creativity and self-regulation abilities?

2. Are digital e-book products practical for improving students' creativity and self-regulation abilities?

3. Are digital e-book products effectively improving students' creativity and self-regulation abilities?

METHOD

Participants

The research participants were 78 grade III elementary school students in Probolinggo, Indonesia. This follows the opinion of Roscoe (1975), namely the appropriate sample size in research is a minimum of 30 participants. The selection of participants was based on purposive sampling (Creswell & Creswell, 2018) because elementary school students are at the level of concrete thinking and need digital media during online learning. In addition, research participants have implemented online learning, and schools need digital media during the learning process. This research was conducted in 2020. Participants comprised two groups. The first group comprised 32 students for field trial 1, and the second group comprised 46 students for field trial 2. The selection of these

two groups is based on two separate classes that have been determined by the school. The description of study participants by gender is shown in Table 1.

Table 1
Descriptions of research participants

	Male	Female	Total
Trial 1	17	15	32
Trial 2	24	22	46
Total	41	37	78

Research procedure

This type of research is research and development (R&D) with the Plomp model (2007), which consists of three stages, including (1) preliminary research, (2) prototyping, and (3) evaluation. The selection of the Plomp model (2007) is based on concise and detailed product development stages. This research produces digital e-books to improve students' creativity and self-regulation abilities. The development of digital e-books needs to go through validity, practice, and effectiveness tests. The stages of research on developing digital e-books that can improve students' creativity and self-regulation abilities are shown in Figure 1.

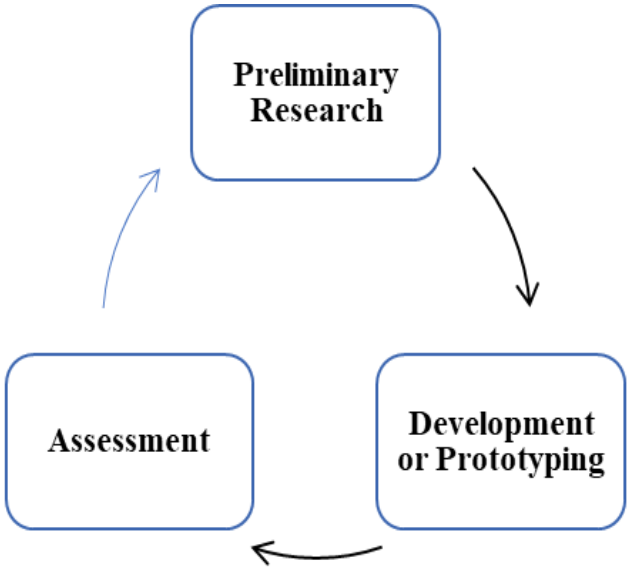

Figure 1
Stages of development of digital e-books (adapted by Plomp, 2007)

Preliminary Research

Preliminary research aims to identify student problems at school. Preliminary research was conducted by direct observation of learning activities and teacher interviews.

Preliminary research shows that learning is still conventional; the teacher only reads PowerPoint slides and gives assignments via email. Learning is done online with the Zoom application. In addition, students become passive and not creative, and students' self-regulation abilities in the learning process are low. Teachers need digital e-book media that support online learning. Therefore, this study wanted to create a digital e-book that could improve students' creativity and self-regulation abilities.

Development or Prototyping

Manufacturing of the products and supporting instruments

The first activity of the research development stage is the preparation of digital e-books that can improve students' creativity and self-regulation abilities. Supporting instruments in this study were student satisfaction questionnaires, product implementation observation sheets, self-regulation ability questionnaires, and creativity tests. The creation of digital e-books and supporting instruments is based on the integration between creativity indicators (i.e., fluency, flexibility, and originality) by Runco (2020) and self-regulatory abilities indicators (i.e., thinking ahead and planning phases, performance monitoring stages, and performance reflection stage) by Zimmerman (2000). The student satisfaction questionnaires have 15 items, and the product implementation observation sheet has 15 items. The researchers themselves made student satisfaction questionnaires and product implementation observation sheets. The creativity test consists of questions about the cube material. The test questions are shown in Figure 2.

Question: What is the probability that the net of a cube whose sides length is 4 cm?

Figure 2
Creativity test questions

Meanwhile, the self-regulation ability questionnaire was adapted by Barnard et al. (2009). The self-regulation ability questionnaire consists of 25 items. The 4-point Likert scale is used in the student satisfaction questionnaire, the product implementation observation sheets, and the self-regulation ability questionnaire.

The validation test of the products and supporting instruments

In the validation activity, the researcher made the validation sheet from the digital e-book product with 33 items, the student satisfaction questionnaire with seven items, the product implementation observation sheet with five items, the self-regulation abilities questionnaire with 25 items, and the test with four items.

Furthermore, the 4-point Likert scale was used for product validation sheets, student satisfaction questionnaires, product implementation observation sheets, self-regulation abilities questionnaires, and creativity tests. Each validation sheet provides a comment or suggestion box for the validator. The validators in this research were two education lecturers and two teachers. The validation results of four validators were analyzed by the following formula.

$$P_j = \frac{K_j}{k} \quad \text{..... (1)}$$

Note
P_j : Percentage for each component
K_j : Average for all validators results in each component
k : Highest scale

Table 2
Criteria of validation

Percentage	Criteria of Validity
$85 \leq P \leq 100$	Very Valid
$70 \leq P < 85$	Valid
$55 \leq P < 70$	Valid Enough
$40 \leq P < 55$	Less Valid
$0 \leq P < 40$	Invalid

* Source: Plomp (2007)

In addition to the validation test from expert judgment, the self-regulation abilities questionnaire was conducted with construct validation tests and reliability tests to determine the effectiveness of using digital e-book products in improving students' self-regulation abilities. Pearson's test analyzed the construct validation of this questionnaire; namely, the significance value is less than 0.05 (Sig. < 0.05). The reliability test of the self-regulatory ability questionnaire was indicated by the value of Cronbach alpha (α) being more than 0.06. The construct validity and reliability test were carried out with the SPSS 22 application.

Assessment

The assessment stage aims to answer the first question about the effectiveness test and practicality test of developing digital e-books that can improve students' creativity and self-regulation abilities. Two field trials used digital e-books for elementary school students to demonstrate the assessment stage. The first field trial was conducted on 32 students, and the second field trial was conducted on 46 students.

Evaluation

Practicality test

The practicality test used a student satisfaction questionnaire instrument and a product implementation observation sheet. In this research, the teacher acts as an observer. The teacher observes student behavior and fills out the product implementation observation sheet. Meanwhile, students fill out a satisfaction questionnaire at the end of online learning. The following formula analyzes the results of the practicality test.

$$R_j = \frac{\sum_{i=1}^{n} Q_j}{r} \quad \text{..... (2)}$$

Note : R_j : Percentage of practicality test on all components
Q_j : Percentage of practicality test for each component
r : All of the components

Table 3
Criteria of practical

Percentage	Criteria of Validity
$85 \leq P \leq 100$	Very well implemented
$70 \leq P < 85$	Well implemented
$55 \leq P < 70$	Enough Well implemented
$40 \leq P < 55$	Poorly implemented
$0 \leq P < 40$	Not implemented

* Source: Plomp (2007)

Effectiveness test

The effectiveness test uses the self-regulation ability questionnaire and the creativity test. At the end of the online learning, students complete a creativity test and fill out a self-regulation ability questionnaire. The creativity test and self-regulation ability questionnaire were analyzed using the Mann-Whitney test. The Mann-Whitney test examines the difference in the mean of the student's creativity test between field trials 1 and 2. In addition, the Mann-Whitney test also examines the differences in students' self-regulation abilities between field trials 1 and field trial 2. The analysis results show a significant difference if the significance value is less than 0.05 (Sig. < 0.05). If there is a significant difference in students' creativity or self-regulation abilities between field trial 1 and field trial 2, then a descriptive statistical test of the mean is carried out to find the source of the difference.

FINDINGS

In the first question, based on the validation results through expert judgment, the validation percentage of digital e-book products is 87.68 %, with very valid criteria. The validation percentage of the student satisfaction questionnaire is 84% with valid criteria. The validation percentage of the product implementation observation sheet is 83.43% with valid criteria. The validation percentage of the self-regulatory ability questionnaire is 85.68%, and the validation percentage of the creativity test is 86.79%, with each very valid criterion. A comment or suggestion box for validators is provided in the validation sheet. After all instruments and products were validated based on suggestions from expert judgment, self-regulation ability questionnaires were distributed to 32 students and then analyzed using Pearson's test. The interesting finding of Pearson's test for 25 items is shown in Table 4.

Table 4
Results from Pearson's test for 25 items

		Total			Total			Total
Item_1	Pearson Correlation	0.501	Item_10	Pearson Correlation	0.501	Item_19	Pearson Correlation	0.507
	Sig. (2-tailed)	0.004		Sig. (2-tailed)	0.004		Sig. (2-tailed)	0.003
	N	32		N	32		N	32
Item_2	Pearson Correlation	0.881	Item_11	Pearson Correlation	0.764	Item_20	Pearson Correlation	0.764
	Sig. (2-tailed)	0.000		Sig. (2-tailed)	0.000		Sig. (2-tailed)	0.000
	N	32		N	32		N	32
Item_3	Pearson Correlation	0.560	Item_12	Pearson Correlation	0.764	Item_21	Pearson Correlation	0.764
	Sig. (2-tailed)	0.001		Sig. (2-tailed)	0.000		Sig. (2-tailed)	0.000
	N	32		N	32		N	32
Item_4	Pearson Correlation	0.881	Item_13	Pearson Correlation	0.401	Item_22	Pearson Correlation	0.507
	Sig. (2-tailed)	0.000		Sig. (2-tailed)	0.023		Sig. (2-tailed)	0.003
	N	32		N	32		N	32
Item_5	Pearson Correlation	0.720	Item_14	Pearson Correlation	0.898	Item_23	Pearson Correlation	0.826
	Sig. (2-tailed)	0.000		Sig. (2-tailed)	0.000		Sig. (2-tailed)	0.000
	N	32		N	32		N	32
Item_6	Pearson Correlation	0.501	Item_15	Pearson Correlation	0.648	Item_24	Pearson Correlation	0.401
	Sig. (2-tailed)	0.004		Sig. (2-tailed)	0.000		Sig. (2-tailed)	0.023
	N	32		N	32		N	32
Item_7	Pearson Correlation	0.881	Item_16	Pearson Correlation	0.764	Item_25	Pearson Correlation	0.764
	Sig. (2-tailed)	0.000		Sig. (2-tailed)	0.000		Sig. (2-tailed)	0.000
	N	32		N	32		N	32
Item_8	Pearson Correlation	0.720	Item_17	Pearson Correlation	0.764	Total	Pearson Correlation	1
	Sig. (2-tailed)	0.000		Sig. (2-tailed)	0.000		Sig. (2-tailed)	0.000
	N	32		N	32		N	32
Item_9	Pearson Correlation	0.507	Item_18	Pearson Correlation	0.764			
	Sig. (2-tailed)	0.003		Sig. (2-tailed)	0.000			
	N	32		N	32			

In Table 4, the Pearson correlation value of 25 items is more than r_{table} ($\geq r_{table}$), or the value of significance of 25 items is less than 0.05 (Sig. < 0.05). This indicates that the Pearson correlation is positive for the 25 items of the self-regulation ability questionnaire. Thus, the 25 items in the self-regulation skills questionnaire are valid.

Cronbach's Alpha score indicates the reliability test for 25 items in the self-regulation ability questionnaire. This reliability test is divided into two, namely the simultaneous and partial reliability tests. Simultaneous reliability tests of the self-regulation ability questionnaire are shown in Table 5.

Table 5
Results of simultaneous reliability test

Cronbach's Alpha	N of Items
0.846	25

In Table 5, the reliability test of all items in the self-regulation ability questionnaire simultaneously shows Cronbach's Alpha = 0.846 > 0.60. This shows that all items in the self-regulatory ability questionnaire are simultaneously reliable. Meanwhile, the partial reliability test for the 25 items in the self-regulation ability questionnaire is shown in Table 6.

Table 6
Partial reliability test

	Cronbach's Alpha		Cronbach's Alpha		Cronbach's Alpha
Item_1	0.840	Item_10	0.848	Item_18	0.848
Item_2	0.816	Item_11	0.826	Item_19	0.840
Item_3	0.837	Item_12	0.848	Item_20	0.844
Item_4	0.848	Item_13	0.844	Item_21	0.848
Item_5	0.829	Item_14	0.816	Item_22	0.848
Item_6	0.857	Item_15	0.835	Item_23	0.824
Item_7	0.848	Item_16	0.848	Item_24	0.844
Item_8	0.829	Item_17	0.853	Item_25	0.848
Item_9	0.840	Item_18	0.848		

In Table 6, the Cronbach Alpha of the 25 items in the self-regulation ability questionnaire is more than 0.6. This shows that the 25 items in the self-regulation ability questionnaire are reliable to be implemented in field trials.

To answer the second question, practicality tests were shown during field trial 1 and field trial 2 through student satisfaction questionnaires and product implementation observation sheets. The percentage of student satisfaction questionnaires in field trial 1 is 67.86%, with the "Good Enough" criteria. On the other hand, the percentage of student satisfaction questionnaires in field trial 2 is 87.67%, with "very well" criteria. This shows that the difference in the percentage of student satisfaction questionnaires on e-book products between field trial 1 and field trial 2 is very significant, namely 19.81%.

The percentage of the product implementation observation sheet in field trial 1 is 73.76%, with the criteria of "well implemented." On the other hand, the percentage of product implementation observation sheets in field trial 2 is 85.87%, with the criteria of "very well implemented." This shows that the percentage of product implementation observations between field trial 1 and field trial 2 is significant, namely 12.11%. The effectiveness test was also carried out during field trial 1 and field trial 2 with self-regulation ability questionnaires and creativity tests. Based on the creativity test results, the mean of the test for field trial 1 and field trial 2 is compared with the Mann-Witney test analysis. The results of the Mann-Whitney test analysis are shown in Table 7.

Table 7
The Mann-Whitney test for the test

	Creativity
Mann-Whitney U	322.000
Asymp. Sig. (2-tailed)	0.000

In Table 7, the value of Mann-Whitney = 322.000 with Sig. (2-tailed) = 0.000 < alpha (α=5%). Thus, the mean difference in students' creativity test scores between field trial 1 and field trial 2 is significant. The difference in the mean of the student's creativity test in detail is presented in Table 8.

Table 8
The mean difference in students' creativity test

	Field trial	N	Mean	Std. Deviation	Std. Error Mean
Creativity	Field trial 1	32	73.4688	2.04757	0.36196
	Field trial 2	46	86.3913	0.61385	0.09051

In Table 8, the mean of the student's creativity test in field trial 1 was 73.4688, and the mean of the student's creativity test in field trial-2 was 86.3913. The difference between the mean of the student's creativity test was 12.9225. This shows a significant increase in students' creativity from field trial 1 to field trial 2. This indicates that students' creativity in trial 2 is higher than in field trial 1 in implementing their self-regulated abilities.

Based on the self-regulation ability questionnaire results, students' self-regulation abilities from field trial 1 and field trial 2 were compared through Mann-Whitney test analysis. The Mann-Whitney test results based on the self-regulation ability questionnaire data are shown in Table 9.

Table 9
The Mann-Whitney test for the self-regulation abilities questionnaires

	Self-regulated Learning
Mann-Whitney U	342.000
Asymp. Sig. (2-tailed)	0.000

In Table 9, the value of Mann-Whitney = 342.000 with Sig. (2-tailed) = 0.000 < alpha (α=5%). Thus, the mean difference in students' self-regulation abilities between field trial-1 and field trial-2 is significant. The difference in the mean of the students' self-regulation abilities in detail is presented in Table 10.

Table 10
Mean difference in students' self-regulation abilities

	Field trial	N	Mean	Std. Deviation	Std. Error Mean
Self-regulated Learning	Field trial - 1	32	3.3125	0.47093	0.08325
	Field trial - 2	46	3.8478	0.36316	0.05354

In Table 10, the mean of students' self-regulation abilities in field trial-1 was 3.3125, and the mean of students' self-regulation abilities in field trial-2 was 3.8478. This very significant difference indicates an increase in the mean of students' self-regulation

abilities (i.e., 0.5353). This means that students' self-regulation abilities in field trial-2 were higher than in field trial-1.

To answer the third question, this study compared the increase in students' self-regulation abilities and the increase in students' creativity. Tables 7 and 9 show that the student's creativity in field trials-2 increased compared to field trials-1. Students' self-regulation abilities followed this in field trials-2, which was better than in field trial-1. This condition occurred because, in trial-1, students got their first experience implementing their self-regulation abilities and being creative. In field trial-2, students are used to applying their self-regulation abilities and being creative. Thus, digital e-book products have succeeded in improving students' creativity and self-regulation abilities.

Overall, digital e-book products are valid, practical, and effective in improving students' self-regulation abilities. This digital e-book product has six topics: cube nets, cuboid nets, cube surface area, cube volume, cuboid surface area, and cuboid volume. Digital e-book products include the main cover, preface; basic competencies and objectives; and material. The digital e-book in this research is shown in Figure 3.

Figure 3
Digital E-book with a self-regulation strategy approach

DISCUSSION

Based on the results of expert judgment validation, the validation percentage of digital e-book products and instruments was above 80%, so the products and instruments were said to be valid for use in field trials 1. However, based on suggestions from the validator, the researcher improved the lesson plans by adding indicators to the basic competencies to be achieved. This is in accordance with the opinion of Casey et al. (2019) that indicators of basic competence are very necessary for making lesson plans in class. Development indicators in the learning curriculum plan become the main competence development of students creatively (Srisakda et al., 2016). Creative competency indicators in the learning planning process can accommodate new, creative,

and innovative learning roles (Phi & Clausen, 2021). In the research, the results of the digital e-book products, instruments, and learning plans that were already valid were continued at the field trial stage in online learning.

Based on student observations and questionnaires, the use of digital e-book products is stated to be practical in improving self-regulation abilities. The increase occurred from field trial 1 to field trial 2, supported by positive responses from students towards digital products, where students are interested in using e-books because e-books are easy to understand. This follows the opinion of Panskyi et al. (2019) that the development of digital e-book products is a new and effective way to attract students' interest in learning so that students' creativity in using these products can develop their self-regulation abilities. On the other hand, the use of digital technology provides creative stimulation to students to create new knowledge (Yang & Zhang, 2016). In addition, product development through digital creativity can develop their creativity, visual interaction, and cognitive abilities (Cybulski et al., 2015).

Based on the Mann-Witney test analysis, a significant increase in students' creativity in implementing digital e-book products was followed by a significant increase in students' self-regulation ability from field trial 1 to field trial 2. Thus, digital e-book products that have successfully triggered an increase in students' creativity effectively improve students' self-regulation abilities. This follows the opinion of Atwood-Blaine et al. (2019), that electronic digital products can stimulate students' creativity, improving students' self-regulation abilities. Norouzi et al. (2021) state that digital products act as good mediators in online learning so that students are triggered to imagine new ideas, work flexibly, and learn to self-regulate.

Product implementation using digital technology encourages students' thinking processes, improves self-regulation ability, and actively generates new ideas in every teaching and learning activity (Sumarwati et al., 2020). Digital product-based learning effectively improves students' creativity, where students are inspired to motivate themselves and manage their self-regulation abilities in solving problems (Arjaya et al., 2023; Barakat, 2023; Behnamnia et al., 2020; Sholehuddin et al., 2023). The application of integrated learning in the assessment of digitized media increases creativity (Lashari et al., 2022; Sajidan et al., 2022). Virtual learning can guide student discovery in learning (Syahwin et al., 2022).

In the effectiveness test above, an increase in creativity followed by an increase in students' self-regulation abilities provides another new question that is considered by the researcher. Researchers suspect there is a correlation between creativity and self-regulation abilities. However, this study has limitations because this research does not identify in depth whether there is a correlation between creativity and self-regulation abilities. Furthermore, the limitations of this research create other questions for further research, namely the extent to which the role of creativity contributes to improving students' self-regulation abilities.

Based on this research, digital e-book products are said to be valid, practical, and effective in increasing the creative and self-regulation abilities of elementary school

students in Probolinggo, Indonesia. Previous research (such as Bray and Tangney, 2017; Sanina et al., 2020; Zboinska, 2019) only developed ordinary digital learning media or products that did not focus on increasing student creativity. Meanwhile, creative products are more effective in helping students' understanding, creativity, and self-regulation abilities. Other studies have not examined the results of this study. Therefore, this research is important to research because this research can contribute knowledge to elementary school teachers in developing valid, practical, and effective digital e-book products to enhance students' creativity and self-regulation abilities.

However, this research has limitations. This study only involved elementary school students. The research scope is also relatively small, namely, only schools in Probolinggo, Indonesia. This is because several schools in Indonesia have not implemented online learning, and researchers have difficulty finding schools that implement online learning with virtual conferences. Therefore, it is hoped that further research on the development of digital e-books can be carried out on various groups of participants from various levels of education (such as several cities, one province, etc.).

CONCLUSION

This study states that digital e-book products are valid, practical, and effective for improving students' creativity and self-regulation abilities. The results showed that the increase in students' creativity from field trial 1 to field trial 2 was also followed by their ability to self-regulate. This shows that digital e-book products have increased students' creativity and self-regulation abilities. Digital e-book products are a good alternative for overcoming the limitations of students' low interest in reading, space, and time, as well as delivering procedural and non-creative materials in online learning. Thus, digital e-book products in online learning are expected to run effectively and efficiently to increase students' creativity and self-regulation abilities.

The creation of a digital e-book based on the integration of indicators of creativity and self-regulation ability in this study provides recommendations for educators to create digital e-books with other materials that are effective in increasing students' creativity and self-regulation abilities. Digital E-book development can be expanded with participants from various levels of education.

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