EFFECTIVENESS OF COLLEGIATE LEARNING ASSESSMENT TASK-BASED EBOOK TO EMPOWER CRITICAL EXPLANATORY WITH DIFFERENT PROBLEM-SOLVING STYLE TYPES

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ABSTRACT

This study has three aims: (1) test the effectiveness of using an ebook based on the Collegiate Learning Assessment (CLA) Task to empower critical explanatory ability; (2) examine the influence of problem-solving style differences on critical explanatory ability; and (3) assess the interaction between the use of CLA Task-based Ebooks and problem-solving styles on critical explanatory ability. This study used a quasi-experimental design and 4×3 factorial design. The instrument was an essay test and Problem Solving Style Questionnaire (PSSQ). ANCOVA was used for data analysis (p = 0.05). This study concludes that: (1) CLA Task-based ebooks are more effective at empowering critical explanatory capabilities than PowerPoint-based CLA Tasks and PowerPoint-based conventional media; (2) Students with the problem-solving Assimilator type have a higher critical explanatory ability value than Diverger, Converger, and Accommodator types; and (3) The interaction between students who use CLA Task-based Ebook media with the problem-solving style Assimilator type has a higher average value of critical explanatory ability than other combinations.

Keywords: *ebook, critical explanatory, collegiate learning assessment, CLA task, Problem-solving style*

INTRODUCTION

The skills that students must have in 21st-century education include collaboration, communication, creative thinking, and critical thinking (Kembara et al., 2019). A person uses critical thinking skills to convey reasons based on existing evidence and facts. The attainment of one's critical thinking skills can be referred to in six aspects: interpretation, analysis, inference, evaluation, explanation, and self-regulation (Facione, 2015). Specific scoring is given to the explanatory aspect as a structured cognitive strategy influenced by metacognition to establish an explanation (Gelerstein et al., 2016). For example, a person who can compose explanatory remarks has a good understanding of the material, can identify a mechanism and pattern, can make predictions, and can exercise control over the problem (Hochstein, 2017). The overall explanatory ability involves students carrying out critical thinking skills through the preparation of indicators (Utami et al., 2021). According to Facione (2015), the three indicators of critical explanatory ability are justifying procedures, stating results, and presenting arguments.

The three indicators of critical explanatory ability are aspects of critical thinking skills.

Indicators of justifying procedures in critical explanatory ability are the same as interpreting problems into a problem formulation and finding a solution (Gelerstein et al., 2016). For the stating results indicator, aspects of inference and analysis should be indirectly carried out by students through exploration and clarification of the steps of the solutions that have been made to solve the problem (Gelerstein et al., 2016). The last indicator, presenting arguments, students must evaluate the solutions' success based on evidence accompanied by arguments (Utami et al., 2021). The decisions that students make when preparing critical explanations are arrived at through self-regulation. Self-regulation can be done when students identify problems, determine problem-solving strategies, and make decisions (Facione & Gitten, 2014).

Based on previous studies regarding critical explanatory ability, for the explanatory aspect of critical thinking skills it is difficult to achieve a significant increase when other aspects also experience a significant increase (Arsy et al., 2020; Duran, 2016; Kong, 2015; Ramandha et al., 2018; Saputri et al., 2019). Based on the PISA (Program for International Students) survey in 2018, Indonesia was in the low category for reading, mathematics, and science skills (OECD, 2019). Science ability is closely related to biology learning (Sayan & Mertoglu, 2020) and critical thinking skills (Aloisi & Callaghan, 2018). The science ability of students in Indonesia had an average score of 389, while the OECD average score was 489 (OECD, 2019). Only about 40% of students in Indonesia can reach Level 2 in science, compared with an OECD average of 78%. Level 2 in the field of science in the PISA assessment is achieved when students can recognize the correct explanation for a scientific phenomenon, use their knowledge to identify simple cases, and make valid conclusions based on data (OECD, 2019). PISA assessment data shows that students in Indonesia are mostly unable to understand explanations through case identification or analysis.

Based on the results of preliminary observations of teachers of biology in the Surakartas' Ex-Residency regional high school, the ability to collaborate, think creatively, and think critically is what students need. One of the critical thinking skills required by students is the ability to re-explain the material that has been obtained by analyzing, evaluating, and compiling a problem solution (Facione & Gitten, 2014). However, the results of the observations show that some teachers do not know that critical explanatory ability is an essential aspect of thinking ability. Low critical explanatory ability can be due to several factors, including the teacher's inability to integrate the characteristics of critical thinking skills into the learning process (Choy & Oo, 2012) and students and teachers having difficulty communicating understanding in written form, developing ideas, and being able to compile explanatory texts effectively and correctly (Melisa et al., 2019).

Improving critical explanatory skills can be done by training students to find solutions based on problems, conduct investigations, and make decisions or solutions based on 'their thinking patterns (Hitchcock, 2017). Students can build real problems and solutions through the assignment of a Collegiate Learning Assessment (CLA) Task (Schendel & Tolmie, 2017). A CLA Task is a form of assessment at the college level that includes open-ended questions, problem-based situations, and the inclusion of information or evidence on the questions as material for analysis (Hyytinen et al., 2015).

The three indicators of critical explanatory ability have different characteristics (Facione & Gitten, 2014). First, justifying procedures in critical explanation should be written according to their reasoning and can be done if given open-ended questions (Kaplar et al., 2021; Kurniawan et al., 2018). Open-ended questions are one of the components of the CLA Task and can be used to reveal a solution to a real and complex problem (Pichette & Watkins, 2018).

The second indicator of explanatory ability is stating results, which are problem-solving solutions. Problem-solving solutions must be based on real problems and solved based on existing information or evidence (Povich, 2021). Real problems accompanied by informational evidence are one of the components of the CLA Task. The third indicator of explanatory ability is presenting arguments based on student reasoning. Explanations can be in the form of explanatory narratives and the compiled explanations must have the components of claim, evidence, and reasoning. A claim must be able to describe something that happened or identify the causal factors of an event (Novak et al., 2009). Evidence is in the form of data to support

the claim (Tama et al., 2016). Students compile scientific data to support an idea or opinion they have (Berland & Reiser, 2009). The reasoning is an explanation that links claims to evidence (Tama et al., 2016). The claim, evidence, and reasoning are obtained from problems, supporting information, open-ended questions, and investigations conducted by students. Characteristics for finding claims, evidence, and reasoning can be trained through the CLA Task.

The preparation of the three critical explanatory indicators by solving problems is carried out independently by students through self-learning with some instructional assistance (Birgili, 2015). Instruction is a direction or instruction given to students to achieve a learning goal (Akdeniz, 2016). Written instruction can be given to students through a learning medium (Wu, 2017). One learning media that can be provided to accommodate students' self-learning abilities is an electronic book (ebook) (Perdana et al., 2017). An ebook is a digital learning medium that contains teaching materials, learning instructions, practice questions, and material explanations like printed modules in electronic form that can be accessed anywhere and anytime by teachers and students (Serevina, 2018). The flexibility of this electronic book makes them better for self-learning than printed books (Darmaji et al., 2019).

The successful application of CLA Task-based teaching materials is closely related to students' problem-solving abilities (Mulligan et al., 2018). Problems in the CLA Task are real, complex problems, so their solution requires good problem-solving skills through sound reasoning (Simper et al., 2019). Real and complex problems encourage students to use the stages of the scientific method (Wolf et al., 2015). The scientific method begins with observations to explain data, compile questions, find problems to solve, and analyze cases (Prince & Felder, 2006). Problems solving in the learning process has four learning cycles, similar to the scientific method. The first cycle, concrete experience, is obtaining information through real practice (McLeod, 2017). The second cycle, the reflective observation stage, is to organize experiences from several perspectives (Duff, 2004). The third cycle, abstract conceptualization, is to develop generalizations to help integrate observations into theory (Duff, 2004). The fourth cycle, the active experiment, is to use generalizations as a guide in solving complex problems (Duff, 2004).

The four learning cycles explain the differences in problem-solving styles that students have (Tepper et al., 1993). The problem-solving styles of students, seen from the learning style according to Romero et al. (1992), is divided into four types: (1) Diverger, (2) Assimilator, (3) Converger, and (4) Accommodator. Diverger types are powerful in analyzing situations and problems and prefer to observe and collect information rather than take action. Assimilator types are strong in analyzing problems and solutions, are interested in abstract ideas and concepts, and feel it is more important that a theory has a logical truth than a practical value. The Assimilator type has the best learning style for understanding and summarizing information. Converger types are powerful in analyzing solutions and their implementation. They can solve problems and prefer to act technically. Accommodator types are strong in analyzing situations and their performance and can learn from experience to be more interested in involving themselves in solving problems and relying on others to analyze problem solutions (Grosse & Simpson, 2008).

Following from this our research had the aim of testing (1) the effectiveness of using an Ebook based on the Collegiate Learning Assessment (CLA) Task to empower critical explanatory capabilities, (2) the influence of problem-solving style differences on critical explanatory ability, and (3) the interaction between the use of CLA Task-based Ebooks and problem-solving styles on critical explanatory ability.

METHODOLOGY

Research Design

This study employed a quasi-experimental design with three research groups. The control class used conventional learning models with PowerPoint (PPT) teaching media, treatment class 1 used case-based learning models with CLA Task-based PowerPoint (PPT) teaching media, and treatment class 2 used case-based learning models with CLA Task-based emodule teaching media. The research design we used was the Nonrandomized Control Group, Pretest-Posttest Design, and a factorial design of 4×3. The factorial design research can be seen in Table 1.

Table 1. Factorial Design 4×3

Moderators' Variable	Problem Solving Style	Class		
		Control (X_1)	Experimental 1 (X_2)	Experimental 2 (X_3)
	Diverger (Y_1)	$X_1 Y_1$	$X_2 Y_1$	$X_3 Y_1$
	Assimilator (Y_2)	$X_1 Y_2$	$X_2 Y_2$	$X_3 Y_2$
	Converger (Y_3)	$X_1 Y_3$	$X_2 Y_3$	$X_3 Y_3$
	Accomodator (Y_4)	$X_1 Y_4$	$X_2 Y_4$	$X_3 Y_4$

Note:

X_1: PowerPoint in conventional learning

X_2: CLA Task-based PowerPoint in case-based learning

X_3: CLA Task-based Ebook in case-based learning

Participants

The population in this study was students of class XI MIPA at one of the high schools in Indonesia. The target population was 252 students divided into seven randomly grouped classes, including XI MIPA 1, XI MIPA 2, XI MIPA 3, XI MIPA 4, XI MIPA 5, XI MIPA 6, and XI MIPA 7. The sampling technique used random cluster sampling, which refers to groups. Each class used as a sample was tested using the equality test. The results of the equality test showed that the classes did not differ significantly, so each class group could be used as a research sample. Therefore, the research samples used were class XI MIPA 5, XI MIPA 6, and XI MIPA 7. The sample used was 81 students, with each group consisting of 27 students.

Instrument and Data Collection

The research instrument to obtain data used an open-ended question test in the form of six cognitive questions with a maximum score of 4. The questions were used to determine the critical explanatory ability of students. The critical explanatory ability was developed and adapted from Gelerstein et al. (2016), which has three indicators: (1) justify procedures, (2) state results, and (3) present arguments.

In addition, this study also used the Problem-Solving Style Questionnaire (PSSQ) instrument to determine the problem-solving style of students. The PSSQ instrument consisted of 14 statements regarding student characteristics from the Problem-Solving Style Questionnaire developed by Romero et al. (1992).

Data Analysis and Techniques

The data analysis technique we used was inferential statistical analysis with the help of SPSS version 16.0. The results of the inferential statistical analysis were used to test the effectiveness of using CLA Task-based Ebooks to empower critical explanatory capabilities and the interaction between CLA Task-based Ebooks and problem-solving styles with critical explanatory capabilities. The effectiveness test was carried out through a covariate analysis (ANCOVA) test using the pretest value as a covariate with a significance level of 5%. In addition, the prerequisite test of parametric statistical analysis was carried out before analyzing the data using the pretest and posttest scores of students' critical explanatory abilities. The prerequisite tests used in this study were normality and homogeneity tests.

FINDINGS

Development Result of the CLA Task-based Ebook

The CLA Task-based Biology ebook ontains assignments with questions that refer to the CLA Task indicator, which include open-ended questions, problem-based situations, and information or evidence on the questions as analysis material (Hyytinen et al., 2015). (The CLA Task-based ebook can be accessed via the link https://bit.ly/EBOOKCLA.)

The systematics of the CLA task-based ebook is the provision of exercise questions that are used as assignments at the end of each learning activity. Learning activities in the ebook are divided into three parts and is intended to make it easier for students to understand the material in detail.

The learning arrangement of the ebook begins with the title of the learning activity and learning objectives, which can be seen in Figure 1. The next page is the learning material that can be seen in

Figure 1. Title and Learning Goals Page

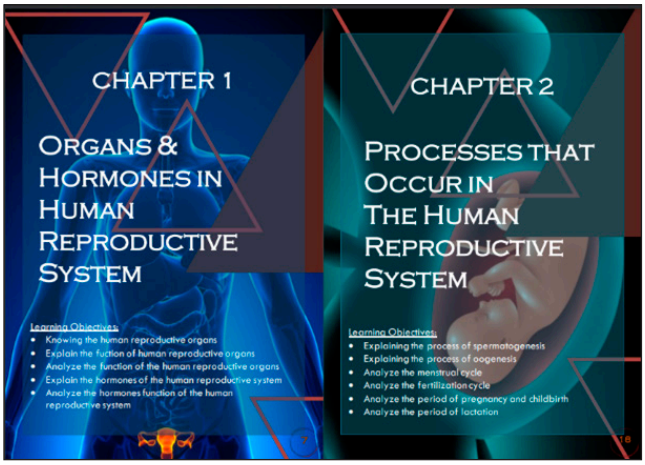

Figure 2. Learning Materials Page

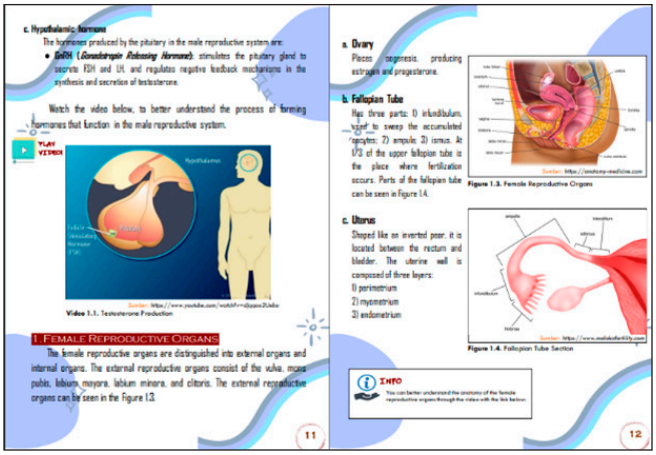

Figure 2. Learning materials are not only in the form of narratives but also videos and hyperlinks to articles and other learning resources per the specific discussion points. Finally, at the end of the learning activity, there are CLA task-based questions to train students' critical explanatory skills, which can be seen in Figure 3.

Prerequisite Test—Normality and Homogeneity Test

Based on the analysis of the normality test with SPSS 16 on the pretest and posttest scores of students' critical explanatory ability, we found that the three groups used in the study had a significance value of > 0.05, which means that H0 was accepted, so the sample used in the study was declared normally distributed. The results of the normality test of the three groups can be seen in Table 2.

Figure 3. CLA Task-based Questions Page

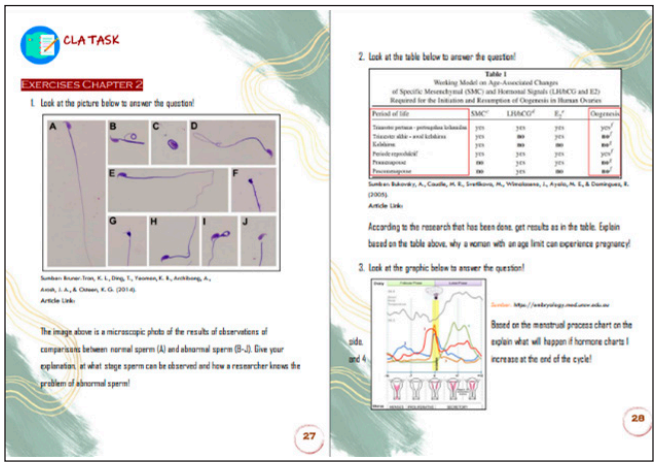

Table 2. Normality Test Results as ANCOVA Test Prerequisites

	Class	Kolmogorov-Smirnov[a]		
		Stat.	df	Sig.
Pre-test	Control XI MIPA 5	.149	27	.128
	Experiment CLA-based PPT XI MIPA 6	.101	27	.200*
	Experiment CLA-based Ebook XI MIPA 7	.165	27	.056
Post-test	Control XI MIPA 5	.157	27	.085
	Experiment CLA-based PPT XI MIPA 6	.162	27	.067
	Experiment CLA-based Ebook XI MIPA 7	.162	27	.066

Based on the homogeneity test analysis with SPSS 16 on the pretest and posttest scores of students' critical explanatory ability, the results obtained show that the significance value was 0.909. The significance value of > 0.05 means that H0 was accepted, so the sample used in the study has a homogeneous variance. The results of the homogeneity test as a prerequisite for the ANCOVA test can be seen in Table 3.

Table 3. Homogeneity Test Results as ANCOVA Test Prerequisites

Levene Statistic	df1	df2	Sig.
.439	9	71	.777

Based on an ANCOVA prerequisite test, the samples used in the study were declared normally distributed and had homogeneous variances. So that it can be further tested using the ANCOVA parametric statistical test.

Table 4. ANCOVA Student Critical Explanatory Capability Test Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	23043.290[a]	10	2304.329	69.271	.000
Intercept	21891.332	1	21891.332	658.079	.000
Pretest	77.933	1	77.933	2.343	.130
Class	16157.850	2	8078.925	242.862	.000
PSS	488.304	3	162.768	4.893	.004
Class * PSS	60.628	4	15.157	.456	.768
Error	2328.587	70	33.266		
Total	450331.000	81			
Corrected Total	25371.877	80			

R Squared = .908 (Adjusted R Squared = .895)

ANCOVA Test Results of Students' Critical Explanatory

Data on the ability of critical explanatory in the study were analyzed using the ANCOVA test with the help of the SPSS 16 program. The results of the ANCOVA test from the value of critical explanatory ability, the type of learning media used, the student's problem-solving style, and the interaction between the media and the student's problem-solving style can be seen in Table 4.

Interaction of CLA Task-Based Learning Media on Students' Critical Explanatory

Based on the results of the ANCOVA test in Table 4, the class significance value was 0.000 ($< \alpha = 0.05$), which means that there are differences in the students' critical explanatory ability scores on the use of learning media and that H0 was rejected. The ANCOVA test results concluded a significant influence on the use of CLA Task-based ebooks compared to PowerPoint-based conventional media on students' critical explanatory ability. The results of the differences in the use of CLA Task and conventional-based learning media can be seen in Table 5.

Interaction of Problem-Solving Style on Students' Critical Explanatory

Based on the results of the ANCOVA test in Table 4, the significance value of the Problem-Solving Style (PSS) was 0.002 ($< \alpha = 0.05$), which means that there were differences in the results of students› critical explanatory ability scores on students› problem-solving styles and that H0 was rejected. The ANCOVA test results concluded that there was an influence of students' problem-solving style on students' critical explanatory abilities. The Assimilator type has the highest average value of critical explanatory ability, with 75.421 compared to the Converger and Accommodator types. The Diverger type could not be analyzed in the sample because only two students had that type, so it required modifications to the population. The results of the analysis of differences in student problems-styles with students' critical explanatory ability scores can be seen in Table 6.

Table 5. Results of Analysis of Learning Media Differences to Student Critical Explanatory Values

Class	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Control XI MIPA 5	4.879E1[a,b]	1.257	46.279	51.294
Experiment PPT XI MIPA 6	8.094E1[a,b]	1.420	78.129	83.792
Experiment Ebook XI MIPA 7	84.266[a]	1.458	81.358	87.174

a. Covariates appearing in the model are evaluated at the following values: Pretest = 41.54.

b. Based on modified population marginal mean.

Table 6. Results of Problem-Solving Style Analysis on Student Critical Explanatory Values

PSS	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Diverger	7.844E1[a,b]	4.095	70.274	86.607
Assimilator	75.271[a]	1.057	73.164	77.378
Converger	71.556[a]	.952	69.658	73.454
Accomodator	69.128[a]	1.846	65.447	72.809

a. Covariates appearing in the model are evaluated at the following values: Pretest = 41.54.

b. Based on modified population marginal mean.

Interaction between CLA Task-based Learning Media and Problem-Solving Style on Students' Critical Explanatory

Based on the results of the ANCOVA test in Table 4, the significance of the interaction between the use of learning media (class) and problem-solving style (PSS) was 0.659 (> α = 0.05), which means that there was no significant influence on the interaction of the use of learning media with student problem-solving styles on students› critical explanatory abilities and that H0 was accepted.

The relationship between the use of learning media and the problem-solving style of students can be analyzed broadly. Students in the treatment group using CLA Task-based ebooks with the problem-solving style Assimilator type had the highest average value of critical explanatory ability results compared to others. The results of the interaction between the use of learning media and problem-solving styles can be seen in Table 7.

DISCUSSION

The Effect of the Implementation of Ebook-based CLA Task on Critical Explanatory Ability

The results of the ANCOVA test in this study found that the use of CLA Task-based ebook media was the most effective combination of media and learning methods to empower students' critical explanatory abilities. This is evidenced by the value of students' critical explanatory abilities in the CLA Task-based ebook treatment class, which had the highest average score and had the highest lower bound and upper bound scores compared to the other two classes.

The use of CLA Task-based learning media in this study showed a significant increase in critical explanatory ability compared to control classes that did not use CLA Task question exercises. These results align with the research of Repo et al. (2017), which states that several criteria in the CLA Task can improve critical thinking skills,

Table 7. Results of Interaction Analysis of the Use of Learning Media with Problem-Solving Style

Class	PSS	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Control XI MIPA 5	Diverger	.[a,b]	-	-	-
	Assimilator	52.046[a]	1.847	48.362	55.729
	Converger	47.419[a]	1.602	44.225	50.613
	Accomodator	46.895[a]	2.885	41.142	52.649
Experiment PPT XI MIPA 6	Diverger	.[a,b]	-	-	-
	Assimilator	85.642[a]	1.925	81.803	89.480
	Converger	80.681[a]	1.510	77.668	83.693
	Accomodator	76.559[a]	3.408	69.762	83.355
Experiment Ebook XI MIPA 7	Diverger	78.441[a]	4.095	70.274	86.607
	Assimilator	88.125[a]	1.692	84.751	91.499
	Converger	86.568[a]	1.827	82.924	90.213
	Accomodator	83.929[a]	3.353	77.242	90.616

a. Covariates appearing in the model are evaluated at the following values: Pretest = 41,54.

b. This level combination of factors is not observed, thus the corresponding population marginal mean is not estimable.

especially explanatory ability. The criteria in the CLA Task that can improve critical explanatory skills are student explanations of the truth of information, explanations of correct logic, elaboration of diverse information, and identifying evidence accurately (Repo et al., 2017). In addition, according to Simper et al. (2019), the CLA Task encourages students to be actively involved in developing solutions to solve problems. The CLA Task has assignment targets so students can reason, evaluate, provide criticism and suggestions, think critically, and explain arguments (Simper et al., 2019).

A more structured and systematic learning media as one of the written instructions is a differentiator in this study. Two groups with high critical explanatory ability scores used the CLA Task learning method. The classes that had a higher average score were those that used CLA Task-based ebooks compared to other classes that used PowerPoint-based CLA Tasks. An ebook is a teaching material to help students learn through activities that are deliberately designed to help students learn independently and achieve the learning goals set at the beginning of the course (Shurygin & Krasnova, 2016).

Ebooks have several advantages over PowerPoints as a learning medium to empower students' critical explanatory abilities. Ebooks are self-instructional, which makes it easier for students to learn independently because the ebook contains learning objectives and contextual material that is arranged in easy-to-understand details, with examples in language following PUEBI (in Bahasa) with material summaries, practice questions, evaluation questions, self-assessment, feedback that teachers can include, and accurate references (Yulando et al., 2019). The contents of the emodule are self-contained and have been predesigned (Castrucci & Norval, 2017). Ebooks are stand-alone learning media that contain teaching materials so that the use of ebooks does not require other media (Osborne et al., 2018). Adaptive ebooks adjust to the development of technology, information, and student learning methods (Mertayasa et al., 2018). User-friendly and easy-to-use ebook development has the main purpose of students being able to access and learn material anywhere and anytime through emodules embedded in student electronic devices (Prima Sari et al., 2021).

The Effect of Problem-Solving Style on Critical Explanatory Ability

The second finding of this study addressed whether there is an effect of problem-solving style on students' critical explanatory ability. Based on the analysis with the ANCOVA test, the type of problem-solving style of students influenced the results of their critical explanatory ability scores. The analysis results showed that the highest average score of students' critical explanatory abilities was owned by students with a problem-solving style of Assimilator type. Conversely, the problem-solving style of accommodator type owned the average result of the lowest critical explanatory ability value. On the other hand, the problem-solving type of Diverger style is rarely found in either sample group and is only encountered a small amount in one sample group.

Students obtained the highest average score results with a problem-solving style of Assimilator type. This is in accordance with the explanation of the Assimilator type according to Grosse and Simpson (2008). Those who have the Assimilator type will emphasize planning solutions with their analysis. Different problem-solving styles emphasize different aspects, with the Assimilator style emphasizing problem and solution analysis (Kolb & Kolb, 2006). Assimilator types have a learning style best suited to understanding various types of information, and they can summarize information into logical forms (Grosse & Simpson, 2008).

The Interaction between the Implementation of CLA Task-based Ebook and Problem-Solving Style on Students' Critical Explanatory Ability

The last finding of this study was the interaction between the differences in the use of learning media and the problem-solving style of students with their critical explanatory abilities. However, the results of the ANCOVA test showed that the interactions that occurred were insignificant, so the descriptive analysis obtained was limited to an outline.

In the results of the ANCOVA test, we found that students who used CLA Task-based ebook learning media with the problem-solving style of Assimilator type had the highest average value of critical explanatory ability. The next highest average level was the group of students who used CLA-based ebooks with the converge type. The third highest average was obtained by a group of students who used a PowerPoint-based CLA Task

with an Assimilator type. Finally, the fourth-highest average was obtained by a group of students who used CLA Task-based ebooks with an accommodator type, who had an average score almost equivalent to the third highest average.

Unlike students who did not use CLA Task-based learning media, although they have an Assimilator type, they were not able to reach the lowest level of equivalent type in the use of CLA Task-based learning media. So, the interaction between CLA Task-based learning media and the type of student problem-solving style can affect the students' critical explanatory abilities even though they are not significant.

CONCLUSION

This study concludes that the development of a biology ebook based on the Collegiate Learning Assessment (CLA) Task has the potential to empower critical explanatory capabilities. CLA Task-based ebooks are more effective at empowering critical explanatory capabilities than PowerPoint-based CLA Tasks and PowerPoint-based conventional media. In addition to learning media, the student's problem-solving style type affects their critical explanatory ability. Students with the problem-solving Assimilator type have a higher critical explanatory ability value than other types. In addition, the interaction between students who use CLA Task-based ebook media with the problem-solving Assimilator type has a higher average value of critical explanatory ability than other combinations. However, other interactions with a high average value of critical explanatory ability are CLA Task-based ebook users with three other problem-solving styles and PowerPoint-based CLA Task users with problem-solving Assimilator types.

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