Eligibility of Case Study-Based Electronic Textbooks To Improve Students' Critical Thinking Skills

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Abstract. The industrial revolution brought new challenges, opportunities and directions to the world of education. Students' critical thinking skills are urgently in line with the demands for increasingly complex problems with cross-disciplinary knowledge. Textbooks that are compatible with the development of material substance, curriculum, and student learning needs are essential. The development of textbooks cuts the barriers to learning and enhances the development of experience, and the continuous renewal of the substance of the course. This study aims to develop an electronic Pancasila and Citizenship Education Instructional Design electronic textbook based on a case study to improve students' critical thinking skills. The research adopted 10 (ten) stages of Borg & Gall's research and development model. This article presents the research and development results up to the operational product revision stage. The article specifically describes the feasibility of the book's material, language, and media aspects developed based on the assessment of competent expert validators in their field. Based on the validation results from the material, language and media experts, it shows that the case study-based electronic Pancasila and Citizenship Education Instructional Design to improve students' critical thinking skills is feasible to use in the field or the lecture process.

Keywords: textbook, electronic, case study, critical thinking skill

1 Introduction

In the last few decades, the attention to critical thinking skills of learners is relatively high in Indonesia. The World Intellectual Property Organization in the Global Innovation Index 2021 places Indonesia in 94th place in the world, below several countries in the Association of Southeast Asian Nations (ASEAN)[1]. Rasmawan's research results noted that students' critical thinking skills were not satisfactory[2]. It is noted that 86% of students are less skilled and even unskilled in critical thinking. This conclusion was drawn through a critical thinking skills test adopted from the Collegiate Assessment of Academic Proficiency (CAAP) Critical Thinking Questions Booklet[2]. In line with the great attention, the high expectation to prepare students who can solve various increasingly complex problems seems to require a very extra effort.

Realizing the importance of increasing critical thinking skills, students need to be trained through various lecture processes. Various policies have been taken by the government as a step to accelerate the acceleration of increasing students' critical thinking skills. The government

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issues policies including student-centred learning, including case study learning[3], [4]. According to Plat, textbook development can be a practical guide to learning that can improve the structure, content, and design of learning materials[5]. The development of textbooks by educators can directly transmit competencies and channel their energy into lectures, develop experiences, and assess equivalent lecture activities [5], [6].

Textbooks have an important role in lectures[5], [7]–[9]. The textbook is a course handbook compiled by subject lecturers or experts in their fields according to curriculum needs and student learning needs[10], [11]. Textbooks are prepared in a relevant, consistent, and sufficient manner based on the material and content needed for the development of attitudes, knowledge, and skills competencies by learning achievement standards[9], [12], [13]. In contrast to reference books, textbooks contain the substance of lecture material that is developed systematically, operationally, and directed by the learning outcomes of graduates and course learning outcomes[7], [9].

Recognizing the important role of textbooks, educators are encouraged to develop textbooks not only as sources but also as innovative learning media[10], [14], [15]. Availability of textbooks developed by educators, presenting learning resources more by student characteristics; compatible with curriculum needs and lecture outcomes; and student learning needs; as well as improving the learning process more effective and optimal[5], [16]. By reading textbooks, students are expected to have enough to understand the entire course content[8].

The development of case study-based textbooks to improve students' critical thinking skills is interesting to do. In addition, the existence of textbooks will encourage learning autonomy, prevent obstacles, and create improvements, and renewal of the substance of lecture materials[17]. The textbook was developed by integrating the case study method which is expected to improve students' critical thinking skills[18]. Substantially, innovative textbooks are effective agents of change in education[19]. Textbooks developed should be able to integrate cases that can be used in case study lectures to improve the quality of national education [10], [14].

2 Method

The article is produced from research and development by adapting the 10 (ten) stages of the Brog & Gall model [20], [21]. The stages of the Brog & Gall Model are Research and Information Collecting; Planning; Developing Preliminary Form a Product; Preliminary Field Testing; Main Product Revision; Main Field Testing; Operational Product Revision; Operational Field Testing; Final Product Revision; and Dissemination and Implementation [20]–[22]. Research and development aim to produce a Pancasila and Citizenship Education Instructional Design electronic textbook. Research and development are carried out at the Department of Pancasila and Citizenship Education, Universitas Negeri Medan.

This article only presents data and a discussion of the stages of Preliminary Field Testing, Main Product Revision, and Main Field Testing. At this stage, the electronic textbook product as a result of Develop Preliminary Form a Product is then tested for feasibility by material, language and media validators. Validators are lecturers who have expertise according to the aspects of the feasibility test that were developed against the textbook. The validation instrument sheet is

prepared using a Likert scale with choices by adopting 4 scales [23], [24] namely: a scale of 4 means feasible, interesting, easy, clear, accurate, and agree; a scale of 3 means fairly decent, interesting enough, easy enough, clear enough, accurate enough, and quite agree; a scale of 2 means less feasible, less attractive, less easy, less clear, less precise, and less agree; and a scale of 1 means invalid, unattractive, uncomfortable, unclear, very inaccurate, disagree.

The validation data was then analyzed using qualitative descriptive data analysis to process qualitative data in the form of opinions, suggestions, criticisms, and comments from the validator. Qualitative analysis was carried out by grouping and describing the data obtained from each expert validation sheet. Meanwhile, quantitative data was carried out using descriptive statistical analysis to process data in the form of numbers obtained from the validation sheet. Quantitative data is converted into simple statistics with the following formula: $\bar{x} = \frac{\sum_{i=1}^{n} xi}{n}$ dengan $xi = \frac{Jumlah\ skor}{Skor\ maks} \times 4$. The score of the results of the feasibility test for each validator is then averaged to determine the feasibility of the textbook, based on the following feasibility criteria:

Table 1. Textbook Feasibility Criteria Scale [25], [26]

Average	Feasibility Criteria	Explanation
3,26< x̄ ≤4,00	Valid	can be used without revision
2,51< x̄ ≤3,25	Quite Valid	need to be revised
1,76< x̄ ≤2,50	Less Valid	cannot be used, due to major revisions and material review
1,00< x̄ ≤1,75	Invalid	cannot be used, because it must be revised total

3 Result and Discussion

The article describes research data that aims to determine the feasibility of an electronic textbook for the Pancasila and Citizenship Education learning design course that was developed. The feasibility of the electronic textbook is tested through the feasibility test of material, language and media validators. The feasibility of the electronic textbook is tested through the feasibility test of material, language and media validators. Each validator is first given an electronic textbook for the learning design course for Pancasila and Citizenship Education so that they can be tried and studied before making an assessment. The electronic textbook feasibility test by experts obtained data from the validation results which are described in the table below:

Table 2. Phase I Validation Results

Validation	Aspect	Σ Score		*xi*		$\bar{x}$	Criteria
		1	2	1	2		
Material	Contents	43	44	3,31	3,38	3,35	Valid
	Presentation	46	44	3,54	3,38	3,46	Valid
	Case Study	37	35	2,64	2,50	2,57	Quite Valid

	Critical Thinking Ability	41	39	2,73	2,60	2,67	Quite Valid
Media	Graphic	183	179	3,16	3,09	3,12	Quite Valid
	Electronic Media	88	206	3,26	3,19	3,22	Quite Valid
Language	Language	44	49	2,93	3,27	3,10	Quite Valid

Based on the validation data of the first stage above, the results of the material validation show that the content and presentation aspects of the material meet the "valid" criteria, each obtaining an average value of 3,35 and 3,45. Another aspect of the material feasibility test is the case study aspect and the aspect of improving critical thinking skills because certain sections must be revised because they only get "quite valid" criteria from the validation results. The case study aspect and the aspect of increasing critical thinking skills only obtained an average value of 2,57 and 2,67, respectively.

The data from media validation in the table above shows that the feasibility of graphics has an average value of 3,12 and the feasibility of electronic media has an average value of 3,22. Both aspects of the feasibility of graphics and electronic media obtained the "quite valid" criteria from the average value of each aspect. Meanwhile, the results of language validation, aspects of language feasibility textbooks obtained an average value of 3.10 with the "quite valid" criteria. The results of the trial of the feasibility of materials, media, and language in electronic textbooks for Pancasila and Citizenship Education learning design courses still need improvement, before using it. Improvements are made by considering the analysis of the lowest value in each aspect, input, and suggestions from the validators.

Textbooks that can help students with learning goals have the following characteristics: (a) self-instructional; (b) recognition of individual differences; (c) contain a specific and explicit formulation of learning objectives; (d) the existence of the structure and sequence of knowledge; (e) the use of various kinds of learning media; (f) active participation of students in learning; (g) the existence of reinforcement; and (j) continuous evaluation [27], [28]. The feasibility test shows that the electronic textbook needs strengthening in some areas. Improvement of the material aspects was carried out to adjust the integration of case study syntax, especially in case selection, case resolution steps such as data collection guidelines; data analysis; and providing alternative solutions or interventions to solve problems. Revision of material aspects is carried out to strengthen students' self-instruction to carry out case study implementation steps independently when using textbooks [29], [30].

The revision of the material content aspect in the next textbook aims to confirm the flow of critical thinking; improve inquiry analysis ability; and packaging alternative solutions as an intervention to solve the problem. The student framework in textual requirements and assignment specifications should further build on existing efforts and represent an important step in turning a framework into an effective assessment. Revision must consider critical thinking flow; inquiry analysis; holistic use of knowledge and skills; and providing alternative solutions following the problems raised in the case study [31].

Improvements to the electronic textbook media were carried out to improve the feasibility of graphic design and electronic media. In the aspect of graphic design, it is necessary to adjust the layout, typography, and adjust illustrations on the cover. Graphic design adjustments need to be

made to enforce consistency of layout, and typography in the body of the book. In the design of the contents of the book, it is necessary to pay more attention to illustrations that are not too flashy, thereby reducing the ease with which students can read textbooks. In addition to materials and media, the linguistic aspect needs to be improved. Textbooks in terms of language structure should be more communicative and organized. The revision of the media aspect tries to encourage the accommodation of different student learning ways through a textbook redesign. Updating electronic media for active participation of students in independent learning through electronic textbooks [27], [28].

After the electronic textbook revision process was carried out, the researcher conducted the second phase of the feasibility test. The revised textbook is then handed back to the validator to be tested later according to the indicators that have been set. The results of the second stage of validation can be seen in the table below:

Table 3. Phase II Validation Results

Validation	Aspect	Σ Score		*xi*		$\bar{x}$	Criteria
		1	2	1	2		
Material	Contents	47	48	3,62	3,69	3,65	Valid
	Presentation	46	48	3,54	3,69	3,62	Valid
	Case Study	50	48	3,57	3,43	3,50	Valid
	Critical Thinking Ability	53	51	3,53	3,40	3,47	Valid
Media	Graphic	212	206	3,66	3,55	3,60	Valid
	Electronic Media	97	94	3,59	3,48	3,54	Valid
Language	Language	52	55	3,47	3,67	3,57	Valid

The results of the feasibility test in the table above improve the quality of electronic textbooks for post-repair learning design courses for Pancasila and Citizenship Education. The results of material validation show that both aspects of content, presentation, case studies, and critical thinking skills all meet the "valid" criteria. Aspects of content, presentation, case study, and critical thinking skills each obtained a score of 3,65; 3,62; 3,50; and 3,47. Likewise, with the results of media validation, the electronic media textbook has met the criteria of "valid" from all aspects. The feasibility of the media on the graphic aspect and electronic media obtained an average score of 3.60 and 3.54, respectively. Meanwhile, the feasibility of the language has obtained the "valid" criteria with an average score of 3.57 from the validation results of the feasibility stage. Based on the results of the second phase of the feasibility test, it can be concluded that the electronic textbook of the Pancasila and Citizenship Education learning design course meets the "valid" criteria for use and does not need to be repaired.

The developed textbook appears to have several advantages over other reference books. electronic textbook of the Pancasila and Citizenship Education learning design course is following the curriculum and characteristics of students in the Study Program of Pancasila and Citizenship Education in Universitas Negeri Medan. The developed textbooks are expected to be more adaptive to the curriculum and student characteristics, user-friendly and active with student learning needs [29], [30], [32]. The developed electronic textbook provides high

accessibility for students to access material content that is in accordance with learning achievement, although it must be evaluated and developed continuously [33]. Effective textbooks depend on good teachers, if accompanied by various adaptations based on curriculum demands and student learning needs [33].

4 Conclusion

Based on the results of research and development on electronic textbooks for Pancasila and Citizenship Education Instructional Design courses, it is concluded that the results of the material, media, and language validators provide that the textbook is valid and feasible to use without having to be re-edited. This conclusion is obtained from the average score of the validator from the aspect of eligibility to meet the "valid" criteria. The results of the validation of the material show that the content, presentation, case study, and critical thinking skills aspects get each score of 3,65; 3,62; 3,50; and 3,47. Meanwhile, the results of the media feasibility test on the graphic aspect and electronic media obtained an average score of 3,60 and 3,54, respectively. Finally, the feasibility of the language has obtained the "valid" criteria with an average score of 3,57 from the validation results of the feasibility stage.

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