

Development of Electronic Book Integrated with Spiritual Values and Case Method on Chemistry Materials for Class XI Even Semester

1st Rayhan Jamilah¹, 2nd Ayi Darmana², 3rd Nurfajriani³

{ chemistry.rj@gmail.com¹, ayidarmana2013@gmail.com², nurfajriani@unimed.ac.id³}

Program Studi Pendidikan Kimia, Pascasarjana, Universitas Negeri Medan, Indonesia¹, Kimia, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Medan, Indonesia^{2,3}

Abstract. This study aims to determine the feasibility of electronic book integrated with spiritual value and case method on chemistry material for class XI in even semester which was developed by using flip builder software. This research method is Research and Development (R&D) method using ADDIE model. The subjects are three material expert lecturers, one IT expert, and three practitioner expert. The data was collected using questionnaire with Likert scale. This study used descriptive quantitative and descriptive qualitative analysis technique. The results show that the developed electronic book was valid. The percentage of material expert validation result is 94.5% while percentage of practitioner expert validation result is 96.25% percentage of practitioner expert validation result is 94.6%. Therefore, based on the predetermined criteria, the electronic book integrated with spiritual values and case method is classified as very feasible and can be used for further research.

Keywords: Electronic Book, Spiritual Values, Case Method

1 Introduction

The national education goals have not been fully achieved due to the mismatches related to the separation of religion and science. This results in other problems sticking out, including: 1) Science teachers tend to be apathetic towards religion, 2) Some teachers consider science to be value-free. 3) In general, thinkers, planners, curriculum implementers, especially teachers, cannot/do not sufficiently understand how to prepare and teach science subjects based on religious moral values that can enable students to become faithful and devoted to God Almighty. This is because they also never get it during school. 4) Very limited references, both in the form of books and experts that can be used as references or models in moral-based science learning that can enable students to become faithful and devoted to God Almighty [1].

Good learning materials should be able to present the subject matter in accordance with the demands of the curriculum, the development of science and technology, and can bridge learning in order to achieve the established competencies [2]. This was in accordance with Faruk explanation of the current teaching and learning process, many still use conventional learning media such as books, modules, and powerpoint files (ppt slides without animation) [3].

Learning process always involve teachers and students. Nurfajriani and Nasution [4, 6] explained that the teachers should be able to stimulate and provide encouragement and reinforcement to dynamize the potential of students, activities and motivation so the teaching and learning process will be more interesting for creating a good learning achievement to answer the challenges of today's modern education.

Case method is expected to reduce the gap between theory and practice. In addition, it is able to provide complex and contextual learning experiences in learning for example, looking for case articles to help students relate phenomena that occur and will be discussed in discussion activities based on observations and student perspectives, so that students not only memorize the content but can also know and understand the purpose of the relationship between the material being taught and real-world situations to fulfill the desired competencies [5].

The case method is a flexible form of learning that includes problem-based learning and encourages the development of reasoning skills. It enables students' high order thinking skills following Bloom's taxonomy of cognitive learning by exposing knowledge in the form of a narration with questions and activities that foster group debate and problem solving [7]. Through conversation, contemplation, and decision-making, students are urged to integrate their prior experiences in order to assess cases and discover answers. On the other hand, case method might be frustrating for learners who do not have time to prepare themselves or who are accustomed to more conventional methods [8].

The school electronic book (BSE), for example, written by Siti Kalsum et al, which was published by the Bookkeeping Center of the Ministry of National Education in 2009, integrates innovative pictures located at the beginning of each chapter. This image relates to the material to be studied in that chapter and is accompanied by an explanation. An example of this is the demonstration of the Tyndall effect by colloidal particles. The beam of light passing through the colloid will appear real. In addition, the book is also integrated with chemical information which contains additional information about the material being studied, for example an explanation of the hemodialysis process (dialysis) in the Colloid chapter.

The school electronic book (BSE) written by Erfan Priambodo et al, published by the Bookkeeping Center of the Ministry of National Education in 2009, integrates innovative images but does not integrate chemical information. Another book is the school electronic book (BSE) written by Budi Utami et al which was published by the Bookkeeping Center of the Ministry of National Education in 2009, integrated with keywords containing important terms in the chapter to be studied, besides that it also integrated an information box titled chemistry around us, for example the explanation of the amount of energy that accompanies the process of photosynthesis in the Thermochemistry chapter. The books mentioned above place more emphasis on the cognitive aspect because they do not contain spiritual values which are expected to improve the spiritual and social competence of students as well [9].

2 Method

This study was carried out in MAN 1 Medan in November 2022 until May 2023. The population is all of chemistry electronic books for class XI. The sample of the study is chemistry electronic books published by Pusat Perbukuan Departemen Pendidikan Nasional. This study uses ADDIE development model which consists of five stages, namely: analysis, design, development, implementation and evaluation. But only three stages are adapted in this study, they are: analysis, design, and development.

1. Stage of Analysis

This stage of analysis is the initial stage where preparations for development are carried out. The need analysis was done with purpose of collecting data with existing conditions as the comparison to the product to be developed and the information about teachers' preference in chemistry lesson along with learning difficulties. The analysis as also done to the sample, they are three chemistry electronic books published by Pusat Perbukuan Departemen Pendidikan Nasional.

2. Stage of Design

This stage of design is a follow-up stage of the analysis stage. At this stage the researcher carried out the design as follows: a) setting the idea and identifying the program. The idea used in this study was to develop an e-book for chemistry for class XI SMA even semester, b) outlining an e-book. This outline shows each content that will be described in the electronic book accompanied by indicators, the topic of the book's contents, as well as the main points of the narrative presentation and in accordance with the integration of spiritual values based on the case method.

3. Stage of Development

This stage of development is the activity of translating design specifications into physical form (product). The product to be made by researchers is an electronic book integrated with spiritual values and case method. This stage is the amalgamation of text media, media that can be manipulated and subject matter. The media that has been developed by researchers will be validated by three validators, namely material experts, media experts, and practitioner experts. The research steps can be seen in Figure 1 below.

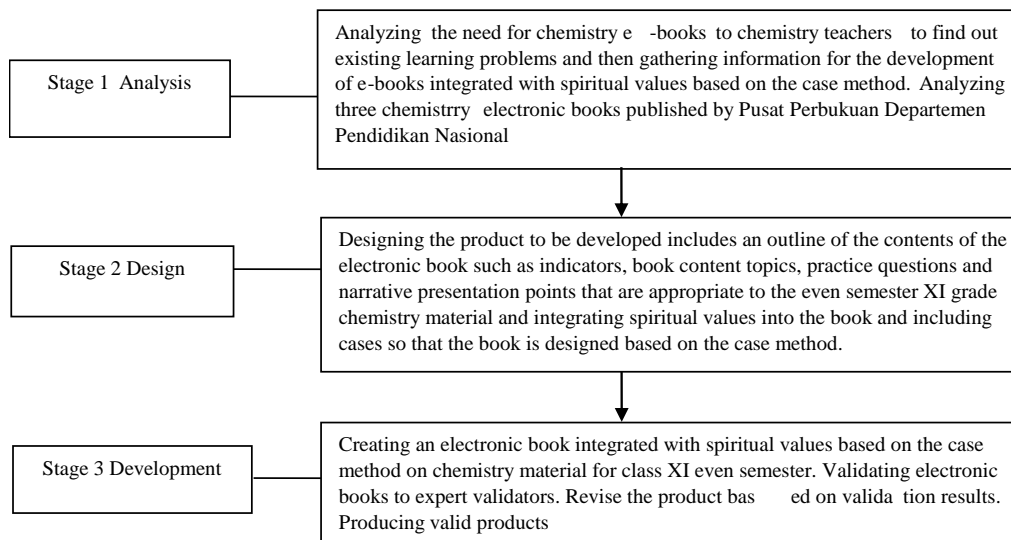


Figure 1. The research steps

3 Results

Analysis

In the analysis stage, a needs analysis was carried out for chemistry teachers in schools. data found that 70% of chemistry learning is done offline, 25% is done online and 5% is done with blended learning system. regarding the completeness of students in chemistry material, it was found that only 23% of students got scores above the KKM, 50% of students got the same score as the KKM, and 27% of students got scores below the KKM. Then to improve student learning outcomes, 70% of chemistry teachers choose good teaching materials, 28% of chemistry teachers choose good teaching strategies, and the remaining 2% choose other options. The analysis of the electronic book sample resulted in Book A with average score of 4.36, Book B with average score of 4.4. Based on this findings the author developed an electronic book which is expected to be the solution of learning needs nowadays.

Design

This e-book was developed using the flip.builder software which can be accessed online using either a PC, smartphone or notebook. This allows users to be able to access these e-books anytime and anywhere while their device is connected to the internet. The initial design of this e-book contains several sections that aim to help users understand the material in the book. These parts can be seen in the following table.

Table 1. Initial design of electronic book integrated with spiritual value and case method

Name	Function
The beginning of the chapter	It contains chapter titles, basic competencies

The core material	to be achieved and apperceptions as a warm-up before entering the core of the material It contains material exposure to the topic being discussed
Keyword	It contains important words that are the core of the discussion of the material
Spiritual values	It contains spiritual values that are integrated into the book aiming to shape the positive character of the reader
Case method	It contains real cases as material for applying the reader's understanding of the material in the form of solutions to these cases
Chemistry info	It contains additional interesting information about chemistry
Activity	It contains practicum on the material being discussed
Summary	It contains the essence of the subject matter in one chapter

The next step is to collect the references related to chemistry subject matter in class XI senior high school in even semesters content in developed electronic book integrated with spiritual value and case method. The chemistry material for class XI in even semester is in accordance with chemistry syllabus of curriculum 2013, namely acid-base solutions, acid-base titrations, salt hydrolysis, buffer solutions and colloid. Next, compile the design and features of the electronic book.

Development

At this stage, researcher developed the product based on design stage. After the electronic book integrated with spiritual value and case method was develop, then the validity test was carried out by expert validators. the electronic book integrated with spiritual value and case method was validated by material experts include aspects of content feasibility, language feasibility, presentation feasibility and graphic feasibility. The results of validation by material experts can be seen in table 2 below.

Table 2. The results of validation by material experts

Assesment Item	Average	Percentage	Criteria
Content feasibility	3.83	95.75%	Valid and does not need revising
Language feasibility	3.73	93.25%	Valid and does not need revising
Presentation feasibility	3.76	94%	Valid and does not need revising
Graphic feasibility	3.83	95.75%	Valid and does not need revising
Average	3.78	94.5%	Valid and does not need revising

Based on the results of validation by material experts the average score is 3.78 with percentage of 94.5%. It can be concluded that the developed electronic book integrated with spiritual value and case method is feasible (valid) and can be used for further research step.

The validation was also carried out to the practitioner experts including aspects of content feasibility, language feasibility, presentation feasibility and graphic feasibility. The results of validation by material experts can be seen in table 3 below.

Table 3. The results of validation by practitioner experts

Assesment Item	Average	Percentage	Criteria
Content feasibility	3.93	98.25%	Valid and does not need revising
Language feasibility	3.80	95%	Valid and does not need revising
Presentation feasibility	3.83	95.75%	Valid and does not need revising
Graphic feasibility	3.86	96.5%	Valid and does not need revising
Average	3.85	96.25%	Valid and does not need revising

Based on the result of validation by practitioner experts the average score is 3.85 with percentage of 96.25%. It means that the developed electronic book integrated with spiritual value and case method is feasible (valid) and can be used for further research step.

Validation was also carried out by an IT expert covering the aspects of guidance and information, program performance, systematics, aesthetics and design principles. The validation results by the IT expert can be seen in table 3 below.

Table 4. The results of validation by IT experts

Assesment Item	Average	Percentage	Criteria
Guidance and information	5	100%	Valid and does not need revising
Program performance	4,6	92%	Valid and does not need revising
Systematic, aesthetics, design principles	4,6	92%	Valid and does not need revising
Average	4,73	94.60%	Valid and does not need revising

Based on the result of validation by IT experts the average score is 4.73 with percentage of 94.6%. It means that the developed electronic book integrated with spiritual value and case method is feasible (valid) and can be used for further research step.

The data obtained from material expert validation, practitioner expert validation, IT validation can be seen in figure 2.

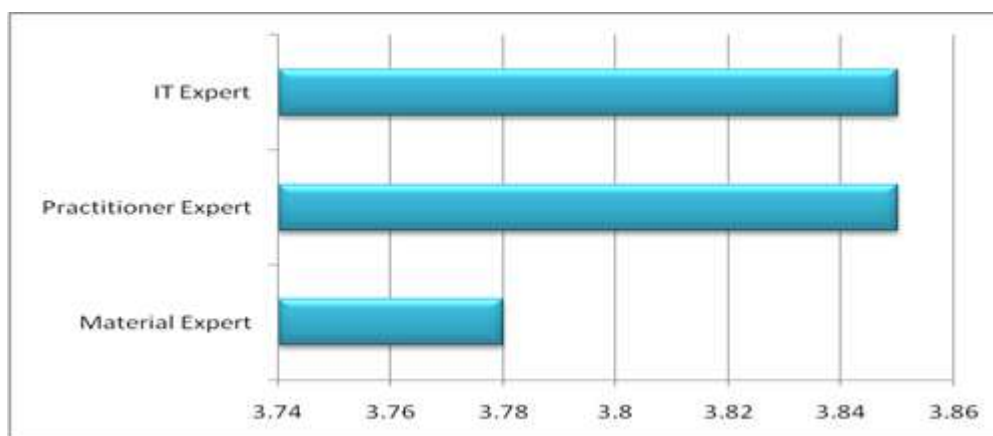


Figure 2. Gaph of expert, practitioner dan IT experts validation result

The feasible (valid) electronic book integrated with spiritual values and case method on chemistry material for class XI in even semester can be seen in figure 3.

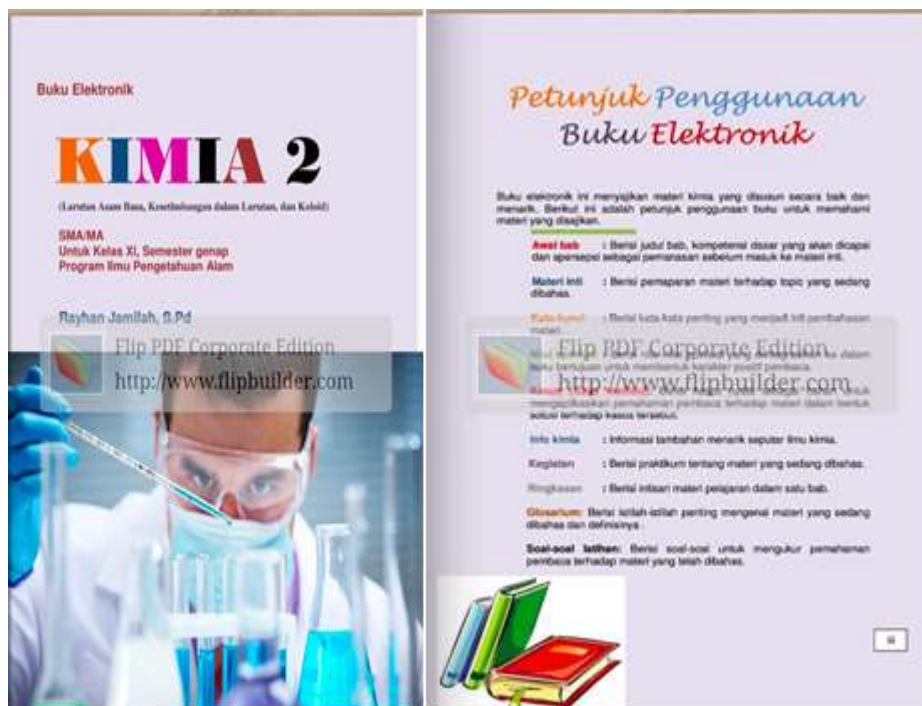


Figure 3. Valid electronic book

4 Conclusion

Based on the data above, it can be concluded that this study produces electronic book integrated with spiritual values and case method on chemistry material class XI in even semester which is expected to be the solution to chemistry learning problem. The electronic book feasibility is tested through validation to material experts, practitioner experts, and IT experts. The results show that the developed electronic book was valid. The percentage of material expert validation result is 94.5% while percentage of practitioner expert validation result is 96.25% percentage of practitioner expert validation result is 94.6%.. The results show that the electronic book integrated with spiritual values and case method on chemistry material class XI in even semester is valid and does not need revising.

References

- [1] Darmana, Ayi, Permanasari, Anna Sauri, Sofyan Sunarya, Yayan.: Pandangan Siswa terhadap Internalisasi Nilai Tauhid melalui Materi Termokimia: Prosiding Semirata FMIPA Universitas Lampung (2013)
- [2] Situmorang, M.: Pengembangan buku ajar kimia melalui inovasi pembelajaran dan integrasi pendidikan karakter untuk meningkatkan hasil belajar mahasiswa. Prosiding semirata FMIPA, Lampung. 237- 245 (2013).
- [3] A. Faruk.: Development of Interactive Learning Media Based Lectora Inspire in Discrete Method Course. Proceeding of Internasional Conference on Research, Implimentation and Education of Mathematic And Sciences. Yogyakarta State University. 18-20 (2014)
- [4] Nurfaejriani and Z Nasution.: The Effect of Macromedia Flash Software on Learning with Cooperative Models of Team Assisted Individualization Type Towards Students' Chemistry Learning Outcomes in the Base of Thermochemical Material. Jurnal Pendidikan Kimia. 7(3): 18-24 (2015)
- [5] Sinaga M, Situmorang M, Hutabarat W.: Implementation of Innovative Learning Material to Improve Students Competence on Chemistry. Indian J. Pharm. Educ. Res. 53(1): 28-41 (2019)
- [6] Prihartini, Y., Kumaidi, K., Mundilarto.: Pengembangan Instrumen Diagnostik Kognitif Pada Mata Pelajaran IPA di SMP. Jurnal Penelitian dan Evaluasi Pendidikan. 20(1) : 111-125 (2016)
- [7] Anderson, L. W., Krathwohl, D. R., Bloom, B. S., & Bloom, B. S.: A Taxonomy for learning, teaching, and Assessing: A revision of Bloom's taxonomy of educational objectives: Complete edition. Longman. pp. 42-46 (2001)
- [8] Billings, D.M., Halstead, J.A.: Teaching in Nursing: A Guide for Faculty. W.B. Saunders, Philadelphia, PA. pp. 76-80 (2005)
- [9] Fitri, E.: Pengembangan LKPP Berbantuan Kvisoft Flipbook Maker Pada Mata Pelajaran Kimia di SMAN 2 Nganjuk. Jurnal Pendidikan Kimia. 9(2) : 281-291 (2021)