Development Acid-Base Titration E-module Based on Blended Learning with Kvisoft Flipbook Maker Application to Improve Student Learning Outcomes

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ABSTRACT. This study aims to determine expert team's assessment acid-base titration e-module based on blended learning with the kvisoft flipbook maker application by BSNP and find out the differences improving student learning outcomes taught using acid-base titration e-module based on blended learning with kvisoft flipbook maker application and students taught using teacher's handbook. The research type utilized to modify development through study and development ADDIE model. The data sources in this research were 2 expert validators and class XI science students of MAN Batubara totaling 60 students using selective sampling for data collecting. The findings demonstrated that the expert team's evaluation of the acid-base titration e-module based on blended learning with the BSNP flipbook maker application on the aspect content feasibility average percentage value 86%, language feasibility 88%, and presentation feasibility analysis 85% and concluded that the media was extremely feasible to use and didn't need to be revised. Additionally, there are variations that improve the academic performance of students who are taught with acid-base titration e-module based on blended learning with kvisoft flipbook maker application and students who are taught using the teacher's handbook.

Keywords: E-module, acid-base titration, blended learning, kvisoft flipbook maker, learning outcomes

1. Introduction

Science is a significant science which talks about arrangement and design with specific properties around us [1]. Anyway, students often consider that chemistry is difficult subject [2], uninteresting and unimportant [3]. Chemistry contains many concepts that are abstract in nature. So to understand, it requires imagination with images or visuals helping. Students' inability to understand the chemistry concepts will cause The perception that chemistry is a challenging topic to learn can be caused by larger issues with studying the chemical principles in general [4].

The weak interaction between teachers and students and the learning skills of students which are often considered the same are also obstacles in chemistry learning. Therefore, the initiatives to enhance the standard of chemistry instruction are currently being carried out, including improving the quality of teaching materials [5]. Teaching materials are learning materials which systematically designed by providing a number of information on knowledge, experience, and skills in the teaching and learning process [6].

innovations that can be used to improve the efficiency of learning and include students actions, such as learning media aid [7], can solve these issues. In order to raise the standard of

AISTEEL 2022, September 20, Medan, Indonesia

DOI 10.4108/eai.20-9-2022.2324787

learning, effective learning materials are also crucial. Information and communication technology is best suited for science advancement in educational activities. The use of information technology in learning is used to promote efficiency and effectiveness, and this is one of the ways that technology is developing in education based on Minister of Education and Culture of the Republic of Indonesia Number 65 of 2013. Today's standards for learning dictate that integrated learning is the best method [8].

Learning with blended learning is form of learning that using technology, namely the internet to improve the quality of student learning, in providing material enrichment and developing methods that will be used in learning [9]. One of the media that is suitable for use in blended learning is e-modules by using the kvisoft application. E-module stands for Electronic Module. E–Module is a learning medium that contains only one learning material and self instructional. E–module is also said to be a set of digital teaching media and systematically structured for self-study [10].

One of the applications that supports learning media to aid in the learning process is the Kvisoft Flipbook Maker. Since this application does not focus solely on written content but also allows for the inclusion of motion, music, and video animation, it may make interactive learning media more exciting and prevent learning from becoming repetitive. Therefore, since e-modules are available as soft files, they can be accessed without a computer and at a low cost using the Kvisoft Flipbook Maker application. Therefore, using this kvisoft flipbook maker application can foster a sense of creativity and be active in learning [11], so that students become more active and can achieve the learning goals that have been set.

2. Method

This research uses the ADDIE (Analysis, Design, Development, Implementation, Evaluation) development model. The research has been conducted at Madrasah Aliyah Negeri (MAN) Batubara, Jalan Perintis Kemerdekaan No. 76 Lima Puluh Cities, Batubara 21255, Sumatra's north. The research was carried out in March–April 2022.

All of the class XI IPA MAN Batubara pupils made up the study's population. With 30 students in each class, the research samples were drawn using purposive sampling data collection methods from students in classes XI IPA 1 and XI IPA 2.

Research tools include surveys based on the BSNP, reliable and valid objective tests, and surveys of students' preferred methods of learning. The Independent Sample T-Test, or two-party The T-test has a uniform and normal distribution, is the data analysis method employed.

3. Results and Discussion

The analysis portion of this study is where it all starts, with analyses of the curriculum, instructional resources, and learning media. The 2013 Curriculum (K–13) Revision at MAN Batubara is the subject of this curriculum analysis, which is shown in table 1. Two learning approaches are developed under the 2013 curriculum: both direct and indirect instruction. Where in the 2013 curriculum are the following learning facets: It should be engaging and motivating, enjoyable, challenging, and encourage active participation from the students. It should also be contextual and collaborative, leave enough room for the students' independence and innovation, and take into account their physical and psychological talents, interests, and developmental needs [12].

The curriculum lists Core Competencies (KI), Basic Competencies (KD) and learning indicators for acid-base titration material. From KI and KD are taken indicators in developing e-modules. The results of previous studies stated that the e-module is based on RPS and the results of textbook analysis, the advantages contained in each book will be used and added aspects necessary for the e-module to be innovative [13].

Table 1. Curriculum Analysis

Curriculum Analysis	Analysis Results
Basic Competencies (KD)	Able to analyze data on the results of various types of acid-base titration.
Indicators in the development of learning media	1) Determine the exact indicators on the acid-base titration and the equivalence point and the end point the titration. 2) Analyzing the acid-base titration curve. 3) Calculating the concentration of acids or bases based on acid-base titration data. 4) Analyze acid-base levels.

After that, researchers interviewed students as part of the analysis of teaching materials and discovered that in chemistry learning on acid-base titration materials there was no handbook for students when participating in chemistry learning and the handbook was not electronically based. And at the stage of analyzing the educational tools utilized, researchers also spoke with students in-person and found that during the learning process, teachers who teach chemistry subjects only use the teacher's handbook, and the titration curves shown are only from the pictures contained in books and the internet without accurate explanations. Relevant to the results of this interview, previous research has stated the use of learning media in the classroom is still minimal due to the limited availability of media utilizing technology that can be used by teachers in the chemistry learning process. This indicates that the chemistry learning process that takes place in the classroom still uses conventional methods. Only basic Powerpoint is the teacher's only form of media [14]. A research or analysis of the demands of the e-module program must be done in order for it to evolve in accordance with needs in the field [15]. According to earlier study, including different forms of media into education is crucial for raising students' aptitudes and teachers' own teaching abilities [16], [17].

Furthermore, researchers carried out the design stage, namely e-module learning developed based on blended learning using the Kvisoft Flipbook Maker application. In any workflow or flow design an information processing is based on a draft e-module consisting of a cover, foreword, table of contents, glossary, concept map, introduction, learning activities, evaluation, scoring guidelines, bibliography and periodic system tables of elements. The Kvisoft Flipbook Maker application was selected as a result of this application's comprehensive features and can be used by anyone, anytime and anywhere via laptop / computer and android using links or barcodes that are spread.

Previous research According to the product creation stage, a desktop prezi application is used to build presentation media. Researchers split a variety of views when creating learning media presentations, including the opening presentation, integrated PBL model materials presentation, learning video presentation, and presentation of practice question examples [18].

The next step is a validation assessment using the BSNP-based Kvisoft flipbook creator program for the blended learning-based acid-base titration e-module. Expert validators do

validation when the developed e-module is finished. Figure 1's average percentage of the validation findings allows us to draw the conclusion that the e-module is very useable and does not require revision. This is in accordance with previous research that shows the creation of chemistry e-modules with the aid of Flip Pdf Professional as learning resources and learning media that are appropriate for use in teaching nonmetallic chemistry on carbon and silicon materials is one of the efforts that educators can undertake [13].

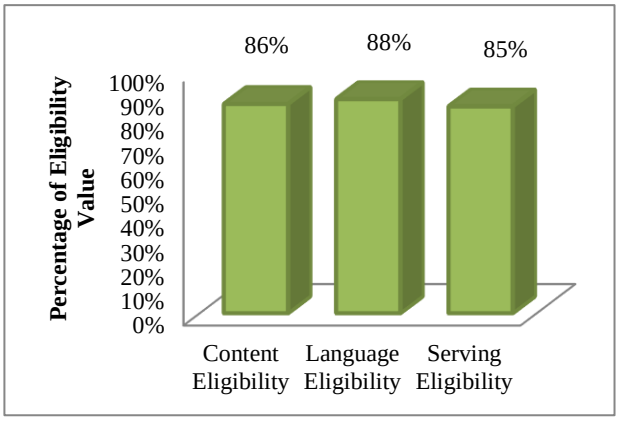

Figure 1. Graph of Feasibility Analysis Results of E-Module Of Blended Learning-Based Acid-Base Titration with Kvisoft
Flipbook Maker Application

According to additional study, Activities that mix active and cooperative learning methods with visualization tools may benefit pupils gain a deeper understanding of bond chemistry principles [19]. Additionally, using animated, interactive movies improves pupils' comprehension [20].

Additionally, there were disparities in this study's teaching methods for enhancing student learning outcomes using a blended learning-based acid-base titration e-module with the kvisoft flipbook maker application (experiment) and students who were taught using the teacher's handbook (control). The average score of the student learning outcomes is shown in table II based on the findings of the treatment of experimental classes and control courses. Table III shows that the percentage improvement in learning outcomes was 65.88% and 45.76%.

Table 2. Data Pretest and Posttest

Data	Control Class			Experiment Class		
	Lowest Score	Highest Score	Average	Lowest Score	Highest Score	Average
Pretest	5	60	26,67	5	75	46
Posttest	45	75	61,5	65	95	82,33

Table 3. Percentage Improvement in Learning Outcomes

Class				Statistic	Std. Error
NGain_Score	Experiment	Mean		,6599	
		95% Confidience Interval for Mean	Lower Bound	,6022	
			Upper Bound	,7155	
		5% Trimmed Mean		,6690	
		Median		,6754	
		Variance		,023	
		Std. Deviation		,15167	
		Minimum		,20	
		Maximum		,88	
		Range		,68	
		Interquartile Range		,19	
		Skewness		-1,119	,427
		Kurtosis		1,513	,833
Class				**Statistic**	**Std. Error**
NGain_Score	Control	Mean		,4577	,02835
		95% Confidence Interval for Mean	Lower Bound	,3997	
			Upper Bound	,5157	
		5% Trimmed Mean		,4623	
		Median		,4686	
		Variance		,024	
		Std. Deviation		,15529	
		Minimum		,10	
		Maximum		,71	
		Range		,61	
		Interquartile Range		,21	
		Skewness		-,430	,427
		Kurtosis		-,381	,833

The experimental class had the best average gain in student learning outcomes (65.88%) out of the two classes. This demonstrates how the blended learning-based acid-base titration e-module with the kvisoft flipbook creator application can improve student learning results since it can assist students learn quickly and engagingly with the help of learning visuals and videos. This is consistent with earlier research that demonstrates how the created learning media can enhance learning results in molecular form materials [21] .

According to a different study, using RPP in conjunction with a blended learning approach makes the learning process more convenient. With online learning techniques and behaviors more intensive conversation in face-to-face meetings, students have plenty of time to learn English whenever and wherever they choose [22]. When using technological learning tools, From the pretest to the posttest, students' scientific knowledge can increase, and they are enthusiastic and enjoy the process [23].

As shown in table IV, where the Sig (0.000) was less than 0.05, it was also found that the two classes that received treatment in this study had different improving student learning outcomes. So that there is a difference in the improvement of learning outcomes of students

who are taught using an acid-base titration e-module based on blended learning with the kvisoft flipbook maker application and students who are taught using the teacher's handbook. This developed e-module can be used as teaching material in chemistry learning. Previous research has that the percent value of the feasibility of teaching materials moodle web solubility and solubility product is 93.5%. Then it can be concluded that developed teaching materials are categorized as very feasible [24]. Teaching materials that are fully developed with engaging and sufficient illustrations will influence the learning environment so that students' learning processes are more effective and will encourage students to use learning materials as learning materials [25].

Table 4. Hypothesis Test Results

Nilai N-gain	Sig	A	Information
Equal variances asuumed	0,000	0,05	Ha Accepted

4. Conclusion

Based on core competencies, fundamental competencies, and learning indicators, the results of the curriculum analysis revealed that: From the analysis of instructional materials and teaching media whiteboards and other media were used, and that the only sources for the pictures were printed materials and the internet.

Expert validators standardized the development of a blended learning-based acid-base titration e-module using the Kvisoft flipbook maker application, and the results showed that the content feasibility percentage was 86% (very feasible and does not require revision), the language eligibility percentage was 88% (very feasible and does not require revision), and the serving eligibility percentage was 85% (very feasible and does not require revision).

Acknowledgment

The author appreciates the support of Dr. Ir. Nurfajriani, M.Si, Prof. Dr. Retno Dwi Suyanti, M.Si, and Khaidir Wijaya, M.Pd. who have agreed to become expert validators. The Principal of MAN Batubara is also thanked by the author for letting researchers to perform their studies there.

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