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Basic Electricity and Electronics Subjects using Canva as a Learning Medium

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Abstract

In today's ever-evolving educational landscape, the integration of innovative teaching methods and tools is essential to engage and educate students effectively. This research delves into the feasibility of employing Canva as a learning medium in Basic Electricity and Electronics courses, aiming to enhance the learning experience in these critical subjects. The study employed a structured questionnaire as its primary research instrument, targeting a diverse group of participants, including subject matter experts, educators, and students. The research focused on evaluating Canva's validity, reliability, and practicality within the context of pedagogy. The validation process, conducted by experts and educators, yielded an average validation score of 0.83, comfortably exceeding the established validity threshold (≥ 0.667). This substantiates Canva's categorization as a valid instructional medium for Basic Electricity and Electronics. The assessment of media reliability, measured using Cronbach's Alpha, produced a commendable score of 0.731, demonstrating high reliability. This underscores Canva's consistency as a valuable learning resource. Furthermore, practicality assessments by both teachers and students resulted in average scores of 90% and 86%, respectively. These scores affirm Canva's high practicality, making it a well-received and user-friendly tool in both teaching and learning contexts. In conclusion, this comprehensive evaluation highlights Canva as a suitable and effective addition to the Basic Electricity and Electronics curriculum. Its successful implementation represents a novel approach to enhancing engagement and comprehension among students in these subjects. The research contributes to the broader discourse on innovative pedagogical strategies and their potential to transform science and technology education. The findings support the notion that Canva serves as a valuable tool for educators seeking to create a dynamic and interactive learning environment in the realm of Basic Electricity and Electronics.

Keywords: *Basic Electricity, Electronics Subjects, Canva, Learning Medium, Pedagogical Innovation*

1. Introduction

When implementing the 2013 curriculum, teachers are expected to establish a conducive learning environment to facilitate the attainment of national education objectives [1]. To enhance active student participation and improve learning outcomes, teachers must also select appropriate learning models and media tailored to the specific class. The choice of learning media should align with the learning objectives and the characteristics of the students, considering factors such as the type of stimuli, classroom conditions, and the scope of application [2]. Innovative thinking plays a crucial role in designing effective learning media [3].

According to the researcher's observations, students do not fully grasp the material presented by the teacher, leading to subpar average scores in their UAS assessments, falling below the KKM [4], as displayed in Table 1. Moreover, student engagement in asking questions and articulating conclusions remains relatively low. This issue may be attributed to the inadequacy of Microsoft PowerPoint as a learning medium to enhance student comprehension and the lack of teacher creativity in crafting engaging presentation slides [5]. The time-consuming process of designing captivating slides and animations may also contribute to this challenge [6]. The following table provides a summary of the final semester exam (UAS) results, as presented in Table 1.

Table 1. A Recap of The Coursework Completed for The UAS Final Test

NO	Class	Number of Students	Complete ≥ 70	Incomplete < 70	Average value
1	XI - B Basics of Electricity and Electronics	30	17 (56,18%)	13 (43,82%)	66,34
2	XI - C Basics of Electricity and Electronics	28	13 (41,24%)	15 (58,76%)	65,39

Source: Basic Electrical and Electronics Subject Teacher at SMKN XYZ

Based on the data in table 1, the average score for each class has not yet reached the KKM. It can be seen that the level of complexity of teaching is not fully in accordance with process standards. For this reason, problems with the learning process in class XI in Basic Electricity and Electronics Subjects at SMKN XYZ.

There is a need for learning media that is able to make the learning process in schools an activity that can increase active participation of students and can increase teacher creativity in terms of creating interesting media and does not require a long time in designing learning media [7]. Where, media is a tool in distributing learning information.

Therefore, researchers applied the Canva learning media. Canva is an online design program, where various graphic designs are available in this medium such as presentations, posters, pamphlets, graphics, banners, invitation cards, photo editing and Facebook covers.

Using Canva learning media can make it easier and save teachers time in designing learning media and makes it easier for teachers to explain learning material [8]. Canva media can also make it easier for students to understand lessons because this media can display text, video, animation, audio, images, graphics and so on according to the desired appearance and can make students focus on paying attention to the lesson because of its attractive appearance.

The purpose of conducting the research was to determine the feasibility of using Canva learning media in the Basic Electricity and Electronics subject in class XI Basic Electrical and Electronics Subject at SMKN XYZ.

After implementing Canva learning media, it is hoped that it can have a positive influence on teachers and students, including teachers being able to use a variety of learning media that are more interesting and interactive and save time in designing learning media and can increase teacher professionalism. As for students, it is hoped that it can increase students' active participation in participating in learning activities and increase student learning outcomes.

2. Research Method

In this research, an instructional development research method was used, namely the Instructional Development Institute model, which is abbreviated as IDI [9]. In the IDI model, the stages in research consist of determination to determine and analyze needs, development to prepare designs and evaluation to assess and improve design results [10].

1) Determination Stage

At this initial stage the researcher determines several things, including determining the material to be taught that is adapted to the syllabus, understanding the characteristics of students and the content of learning media adapted to the learning model that takes place at school. The learning model applied at SMKN XYZ.

2) Development Stage

At this development stage, an analysis of the needs obtained at the determination stage is carried out [11]. The development stage includes determining basic competencies and learning indicators, teaching methods, systematics of learning materials adapted to the 2013 curriculum and designing prototypes of the designed learning media.

3) Evaluation Stage

At the evaluation stage, a trial was carried out on the use of learning media for students in class XI - B in Basic Electrical and Electronics Subjects at SMKN XYZ. The basic competency taught is analyzing the workings of basic digital electronic circuits with the learning material being number systems, basic logic gates, and combinational and sequential circuits. Before being tested on students, this media was first validated by experts. After analyzing the validation, if it is in the appropriate category then the media can be applied in the trial class. After the learning process using Canva media was carried out, a practicality test was carried out by students and teachers.

The preparation stages that researchers have carried out starting from determining students' needs to analyzing and drawing conclusions are as follows:

1. Determine student needs
2. Analyzing student needs
3. Study the material that will be taught
4. Determine the research school
5. Conduct observations at schools
6. Establish a research schedule
7. Prepare learning tools (syllabus, Learning Implementation Plan (RPP) and teaching materials)
8. Create research instruments
9. Designing Canva learning media
10. Carrying out media validation by lecturers and teachers
11. Conduct trials using Canva learning media
12. Carrying out practicality tests by teachers and students
13. Carry out data analysis and draw conclusions

The instrument used to determine the assessment of the media is a questionnaire. This instrument consists of a questionnaire on the validity and practicality of the Canva learning media, which was distributed to experts, teachers and students. The validity questionnaire includes didactic, construction and technical aspects.

The grid of the media validity questionnaire can be explained in table 2 below:

Table 2. Media Validation Questionnaire Grid

NO	Rated aspect	Indicator
1	Technical Terms	The manufacturing process becomes simpler and more efficient, saving time. Color combinations that match the font

		type and background, clear text, and attractive templates are all supported by adequate image quality.
2	Didactic Terms	Increase understanding, motivate and provide direction to students.
3	Construction Requirements	Present the material in detail, include the identity of the material, use sentences that are easy to understand, arrange the material systematically, and use Indonesian appropriately.

The practicality questionnaire covers aspects of the practicality of Canva learning media for teachers and students, both in terms of media creation, media usefulness, media appearance, can be applied or implemented in other subjects, ease of operation, and suitability of media characteristics with learning material as well as the large variety of animations and templates provided. Each item has the highest score, namely 5. The grid of the media practicality questionnaire can be explained in table 3 below:

Table 3. Media Practicality Questionnaire Grid

NO	Rated aspect
1	Easy to use
2	Students quickly understand learning concepts
3	The appearance is attractive
4	Can save teachers time in designing
5	Can be implemented for other subjects
6	Forms of variations in learning media
7	Provides various types of educational presentation templates
8	Interesting combination of colors and animations
9	Designed according to learning material
10	Can be designed at any time

The Canva learning media tested the validity, reliability and practicality of the media [12]. The validity test aims to determine the level of validity or suitability of the Canva learning media [13]. Media reliability data was obtained after testing the validity of the Canva learning media. The media practicality test is used to determine the practicality of the Canva learning media for teachers and students by providing respondent questionnaires [14].

In the final stage, perform data analysis using Microsoft Excel and SPSS version 20 software to calculate research results. The data analysis technique used is inductive analysis consisting of media validity testing, media reliability testing, and media practicality testing. Then draw conclusions from the results obtained according to the data analysis techniques used.

2.1 Literature Review

2.1.1 Canva Learning Media

Canva is an online design program that provides various tools such as presentations, resumes, posters, pamphlets, brochures, graphics, infographics, banners, leaflets, certificates, diplomas, invitation cards, business cards, thank you cards, postcards, logos, labels,

bookmarks, newsletters, CD covers, book covers, desktop wallpapers, templates, photo editing, YouTube thumbnails, Instagram stories, Twitter posts and Facebook covers. The types of presentations available on Canva include creative, educational, simple, business, marketing, sales, architecture, advertising, technology presentations. In this research, educational presentations are used that provide various types of designs. In designing, teachers simply enter text, images, and choose the type of graphic design, template and page number provided according to what they want.

Apart from that, Canva is not just a design platform, but also a very useful tool in learning with several main advantages [15]. Canva provides a variety of very attractive graphic designs, animations, templates and page numbers, allowing teachers to create learning materials with an attractive and professional visual appearance [16]. The complete and intuitive features in Canva allow teachers to increase creativity in designing learning media, while the drag and drop feature makes the design process easier and faster [17]. Canva also saves time in the learning media design process, thanks to its practical interface, allowing teachers to quickly create learning materials without getting bogged down in design complexities [18].

Students can easily re-study the material through the Canva learning media provided by the teacher [19]. Canva's good image resolution and ability to print slides with automatic print size settings makes for a better learning experience [20]. In addition, Canva facilitates collaboration between teachers and design teams to share learning media and can be used on mobile phones, enabling learning media design anytime and anywhere [21].

While there is a payment for adding animations via credit card, Canva allows users to download media in a variety of storage formats such as PDF and JPG, so it can be easily used offline and integrated with other platforms such as PowerPoint for offline presentations [22].

3. Findings

3.1 Media Validity Test

Data from the validation of Canva learning media, in the form of material validation and media validation, was analyzed in the following stages:

1. Provide an assessment score with the conditions in accordance with table 4. below:

Table 4. Media Validity Criteria

Assessment Score	Criteria
1	Very less
2	Not enough
3	Enough
4	Good
5	Very good

2. For each item the maximum assessment score is 5.
3. The validity value is calculated using the Aiken's formula as follows:

$$V = \frac{\Sigma S}{n(c-1)} \quad (1)$$

Information :
V = Item Validity Index
S = r - lo
ΣS = S1 + S2 + etc
n = Number of Raters

4. The level of validity, the V value obtained is between 0 and 1.00. The validity category

is in the valid category if the range is ≥ 0.667 as a fairly high coefficient. If the validity value is <0.667 then the media is declared invalid.

3.2 Media Reliability Test

Media reliability data was obtained after testing the validity of the Canva learning media. Reliability analysis can be calculated using the *alpha* formula, as follows:

$$r_{11} = \left[\frac{k}{k-1}\right]\left[1 - \frac{\Sigma\sigma_b^2}{\sigma_t^2}\right] \quad (2)$$

Information :
r_{11} = Media reliability
k = Number of Question Items
$\Sigma\sigma_b^2$ = Number of Variant Items
σ_t^2 = Total Variance

In the calculations, the SPSS version 20 program was used to calculate the Cronbach's Alpha value, then determine the reliability category according to table 5. below:

Table 5. Media Reliability Criteria

NO	Cronbach's Alpha Value	Criteria
1	0.20 - 0.40	Low
2	0.40 - 0.60	Medium
3	0.60 - 0.80	High
4	0.80 – 1	Very High

3.3 Media Practicality Test

Data for the practicality of Canva learning media was obtained from a questionnaire distributed to teachers and students. In analyzing the practicality of the Canva learning media, a Likert scale was used. The analysis is carried out in the following way:

Give an assessment score with a rating of strongly agree with a score of 5, agree with a score of 4, slightly agree with a score of 3, disagree with a score of 2, and strongly disagree with a score of 1.

1. All the scores of the aspects assessed are added up.
2. For each item the maximum assessment score is 5.
3. To calculate the percentage value of media practicality, the following formula is used:

$$\text{The Value of Practicality} = \frac{\Sigma Score\ Obtained}{\Sigma Maximum\ Score} \text{ X } 100\% \quad (3)$$

The practicality criteria for Canva learning media can be seen in table 6 below:

Table 6. Media Practicality Criteria

NO	Achievement Level	Criteria
1	0 - 54	Impractical
2	55 - 59	Less Practical
3	60 - 75	Practical enough
4	76 - 85	Practical
5	86 - 100	Very Practical

3.5 Description of Research Results

The research was conducted at SMKN XYZ, majoring in Refrigeration and Air Conditioning Engineering, class The research design used is the Instructional Development Institute development model. This stage consists of the determination, development and evaluation stages.

On the Canva media, there are various templates and various transitions available so that you can see interesting slide movements and various graphics that can be added to the templates as well as animation support that can support the display of learning presentation slides. The initial display of the Canva learning media design is in the form of the title of the learning material which is designed with an attractive template. The initial appearance of the media is depicted as in Figure 1 below:

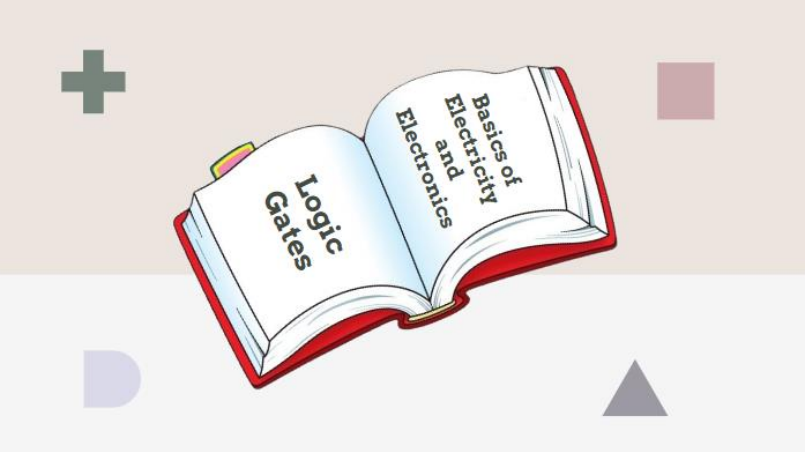

Figure 1. Initial Appearance of Canva Learning Media

The display of learning materials is made in a non-monotonous display so that the appearance does not make students bored while learning. The template design is also made attractively, accompanied by slide transitions such as wipes and so on and attractive animation displays. The appearance of the material is depicted as in Figure 2 below:

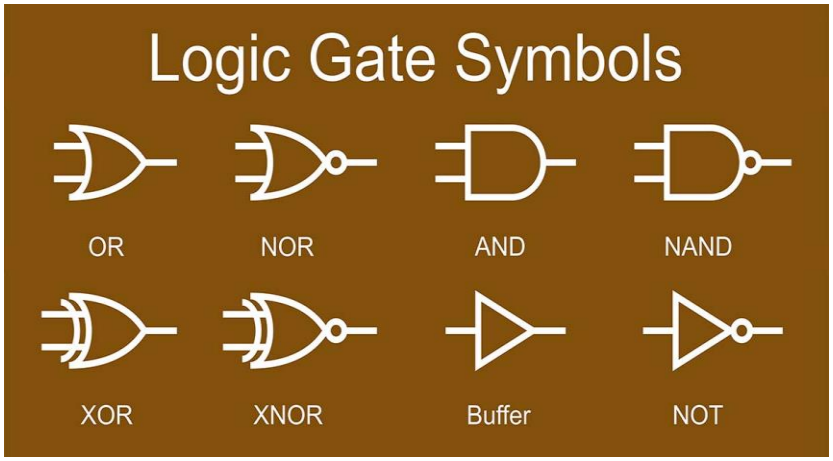

Figure 2. Display of Learning Materials

The quiz display consists of several practice questions. This exercise is given to students to see learning outcomes and see the effectiveness of this media in increasing students' understanding. This exercise is a form of the discovery learning model, namely students solve problems in the form of practice questions together with their study group. The exercise display is depicted as in Figure 3 below:

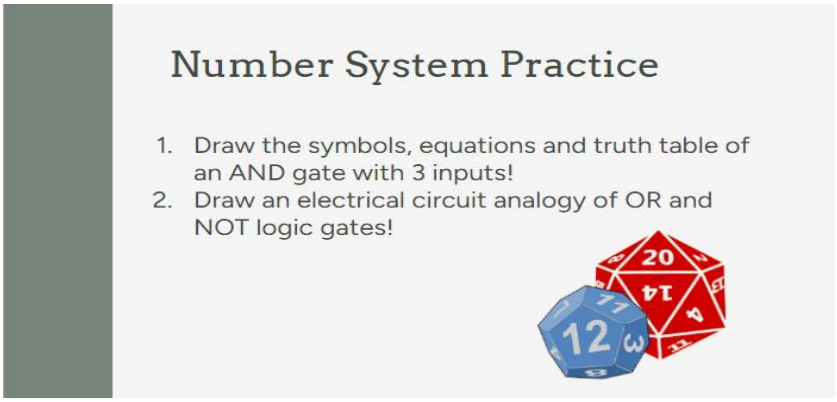

Figure 3. Display of Learning Media Training

The Canva learning media tested the validity, reliability and practicality of the media. The validity test is used to determine the level of validity or suitability of the Canva learning media. Before being implemented in schools, this media is first tested for validity and practicality by media experts and material experts. Then analyze the results of the questionnaire, if it is included in the valid and practical category then the new Canva learning media can be applied in the learning process at school. There were 3 validators in the research, including 2 lecturers in the Department of Electronics Engineering, Faculty of Engineering, UNP as experts, as well as a teacher of Basic Electricity and Electronics. Media reliability data was obtained after testing the validity of the Canva learning media. The media practicality test was used to determine the practicality of the Canva learning media for teachers and students by giving questionnaires to 2 teachers with basic subjects in electricity and electronics and air conditioning installation systems and 28 students in the experimental class.

3.6 Research Result

3.6.1 Media Validity Test Results

The media validity value is calculated using the Aiken's formula, so that an average V value of 0.83 is obtained, which means the validity value is ≥ 0.667, so that its validity can be categorized as being in the "valid" category. The following is the calculation of media validity for the didactic aspect of indicator 1:

$$V = \frac{\Sigma S}{n(c-1)} = \frac{11}{3(5-1)} = \frac{11}{12} = 0{,}092$$ **(Valid)**

3.6.2 Media Reliability Test Results

The media reliability value was calculated using the Alpha formula, obtaining an instrument reliability of 0.731. In calculating the analysis, the SPSS version 20 program was assisted to calculate the Cronbach's Alpha value. After calculating, the values obtained are as shown in table 7 below:

Table 7. Reliability Statistics

N of Items	Cronbach's Alpha
14	733

The results of calculations using SPSS version 20 obtained a Cronbach's Alpha value of 0.731, which shows that the reliability criteria for Canva learning media are at high criteria.

3.6.3 Media Practicality Test Results

Maximum score = Highest score x Number of items

= 5 x 10
= **50**

Practicality value 1 = $\frac{\Sigma Score\ Obtained}{\Sigma Maximum\ Score}$ X 100%
= $\frac{46}{50}$ X 100% = **92%**

Practicality value 2 = $\frac{\Sigma Score\ Obtained}{\Sigma Maximum\ Score}$ X 100%
= $\frac{44}{50}$ X 100% = **88%**

Average Practicality Value = $\frac{(92+88)\%}{2}$ **= 90%**

After applying Canva learning media to the learning process at the research school, the results of teacher and student questionnaires obtained an average validity value of 0.83, which indicates that Canva learning media is appropriate or valid to be applied to the learning process. The reliability value of Canva learning media was obtained at 0.731 which shows that the media has high reliability. Meanwhile, the practicality percentage value for Canva learning media is 90% for teachers and 86% for students, which shows that this learning media has very practical practicality.

From the results of the questionnaire, it can be seen that Canva media can be used to support the learning process, so that it can advance the quality of education, teacher creativity and save teachers' time in designing learning media. Based on the results of students' practicality, it can be seen that students have quite high enthusiasm in the learning process because of the practicality of the media, so that it can also improve learning outcomes.

4. Conclusion

The application of the Canva learning media was declared valid and practical for application in experimental classes. This can be seen from the calculations of the validity, reliability and practicality tests of the media. Canva media can also be implemented in other subjects because it has also tested the validity of the media given to teachers in other subjects, namely the air conditioning installation system at SMKN XYZ.

It is hoped that Canva learning media can be a consideration for teachers in schools to apply a variety of learning media in the teaching and learning process to improve the quality of education. It is hoped that this article can become a reference for future researchers. To overcome the lack of media, where Canva presentations can only be carried out online, teachers should download the media results and collaborate with other media such as PowerPoint.

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