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Perceptions of the Use of EveryCircuit-Based Virtual Laboratory on Dynamic Electricity Material

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Abstract *– The integration of virtual laboratories has become an innovative solution for enhancing physics education, particularly in addressing challenges related to limited access to physical laboratory resources. This study aims to investigate the perceptions of physics education students at Cenderawasih University regarding the use of EveryCircuit-based virtual laboratories in learning dynamic electricity concepts. A quantitative descriptive approach was employed, with data collected through an online questionnaire distributed to 16 students. The questionnaire assessed three key aspects: material comprehension, usability of the EveryCircuit application, and students' motivation and skills. The results revealed that 42.50% of students agreed that the EveryCircuit-based virtual laboratory improved their understanding of dynamic electricity concepts, while 46.87% agreed on its usability, and 43.75% reported enhanced motivation and skills. Despite positive responses, some challenges emerged, including limited proficiency in using EveryCircuit and occasional technical barriers such as unstable internet connections. Overall, the findings suggest that EveryCircuit-based virtual laboratories offer an effective alternative for teaching dynamic electricity, promoting a more interactive and accessible learning environment. The study recommends further research to address technical challenges and improve training on the use of virtual laboratory tools. Additionally, incorporating complementary digital resources and hands-on guidance could enhance the overall effectiveness of virtual laboratory implementation in physics education.*

Keywords: *dynamic electricity; everycircuit; virtual laboratory*

I. INTRODUCTION

The rapid advancement of information and communication technology in the industrial revolution 4.0 era has significantly influenced the educational landscape. These technological and scientific developments encourage educators to leverage innovative tools to optimize the learning process. Effective learning relies on meaningful interactions among students, educators, and learning resources within a supportive environment (Makiyah et al., 2022). In physics education, which often involves abstract concepts, the use of appropriate instructional media is essential to simplify complex ideas and improve understanding (Rais et al., 2020).

To overcome limitations in traditional laboratory settings, practical activities must continue, with virtual laboratories emerging as an effective alternative. These laboratories provide simulated environments and online collaborative platforms where students and educators can interact, exchange ideas, and conduct experiments virtually (Muhajarah & Sulthon, 2020). This approach eliminates the dependency on physical laboratory equipment, enabling students to carry out experiments using smartphones, laptops, or internet connected devices. In educational institutions facing limited access to laboratory facilities, EveryCircuit-based virtual laboratories offer a practical and accessible solution for teaching and learning dynamic electricity concepts effectively.

A significant challenge in physics education is the limited computer proficiency of some lecturers. Some educators lack the skills to create or utilize digital learning media effectively. Traditional teaching methods, such as whiteboard-based instruction, still dominate in many classrooms (Swandi et al., 2020). While some educators employ tools like PowerPoint, others remain technologically illiterate, which limits their ability to incorporate advanced teaching methods (Irsan et al., 2021). This calls for greater attention to equip educators with the skills necessary to deliver creative, innovative, and engaging learning experiences (Hidayati & Puspitarini, 2020). IT skills are essential for educators. In addition to mastering physics content, educators must develop skills in creating engaging media and teaching materials. They are expected to design interactive, engaging, memorable, and user-friendly learning media (Katoch, 2020). Several researchers have developed virtual animation programs that serve as virtual laboratories to enhance students' understanding of physics concepts (Wahyudi & Lestari, 2019; Palloan et al., 2021; Sapriadil et al., 2019; Swandi et al., 2020).

Observations of physics education students at Cenderawasih University reveal that their practicum sessions are typically conducted in physical laboratories. Students often need to assemble and combine tools for each session, ensuring the practicum is completed correctly. This repetitive process can lead to student boredom, as they must assemble and locate tools for each practicum. A key challenge for Cenderawasih University physics education students is the significant distance between their program and the laboratory facilities. This requires students to travel long distances, spend significant time, and use laboratory equipment that is often incomplete. To address these issues, researchers propose the use of EveryCircuit, an electronics simulation software available for smartphones and computers. The application features a virtual worksheet with electronic components that users can simulate. Its small size and sleek interface make it highly practical for use. This application can be used to apply to physics education students at

Cenderawasih University in Dynamic Electrical Practicum.

Using EveryCircuit, students can eliminate the manual process of searching for and assembling tools. The application enables students to add components such as voltage sources, current sources, and resistances with specified values. Students can assemble components in series or parallel by simply clicking and dragging as per instructions. The correctness of the prepared circuit is verified by running a simulation. The presence of electric current in the simulation indicates the circuit's accuracy. Given the features of EveryCircuit, it is particularly suitable for dynamic electrical material. This application enhances students' circuit analysis skills. Apart from that, based on basic competencies, dynamic electricity material also requires students to analyze.

Several studies have also explored virtual laboratories. For example, Yanti et al. (2020) found that implementing virtual laboratories significantly enhanced students' physics competencies. This demonstrates the suitability of virtual laboratories for physics education. Tarisahfira (2022) also concluded that EveryCircuit is highly effective for developing teaching modules and improving student learning outcomes compared to other applications. A study by Imawati and Yundra (2020) and Sartika (2022) on using EveryCircuit in physics learning showed positive results. Their findings confirmed that EveryCircuit is well-suited for physics education.

However, prior studies identified limitations, including (1) challenges in selecting appropriate materials for EveryCircuit-based virtual laboratories and (2) an exclusive focus on virtual laboratories without considering the applications utilized. To address these limitations, this study focuses on aligning the material being taught with suitable applications. Therefore, the purposes of this study is to assess the perceptions of Cenderawasih University physics education students after using EveryCircuit-based virtual laboratories for dynamic electrical material. Additionally, the study explores whether students' experiences with the EveryCircuit-based virtual laboratory inspire interest in using the application for other physics materials.

II. METHODS

This study employed a survey method by distributing questionnaires to Physics Education students at Cenderawasih University. The questionnaire was distributed online via Google Forms for students to complete. The questionnaire, validated by experts, served as the primary data collection instrument, allowing respondents to provide input on various statements. Following validation, the questionnaire was distributed to 16 students, and the responses were subsequently analyzed. Data were analyzed

using a quantitative descriptive technique, interpreting the percentage of responses for categories such as strongly disagree, disagree, neutral, agree, and strongly agree. After they have given their choice by ticking, an analysis is then carried out using equation 1 below to see the percentage of students. This study employed a purposive sampling technique, selecting participants based on specific criteria to ensure a sample representative of the population (Sugiyono, 2013). The sample comprised physics education students who had previously studied or used EveryCircuit-based virtual laboratories for Dynamic Electricity material. A total of 16 students participated in this study.

The primary instrument in this research was a questionnaire. It utilized a Likert scale for measurement. The Likert scale, developed by Likert, combines multiple questions to generate scores representing an individual's characteristics, knowledge, and responses (Maryuliana et al., 2016). The following is the assessment rubric for the Likert scale:

Table 1. Likert scale assessment rubric

Score	Category	Symbol
1	Strongly disagree	SD
2	Disagree	D
3	Neutral	N
4	Agree	A
5	Strongly agree	SA

The distributed questionnaire focused on three key aspects. These include: (a) understanding the material, (b) using the EveryCircuit-based Virtual Laboratory application, and (c) motivation and skills. The material understanding aspect comprises 5 questions, the EveryCircuit-based Virtual Laboratory application aspect includes 4 questions, and the motivation and skills aspect contains 10 questions, making a total of 19 questions across the three aspects.

Responses from the questionnaire will be analyzed and converted into percentages using the following formula:

$$\% P = \frac{f}{N} \qquad 1)$$

Description:

P = group percentage number
F = number of students in each group
N = total number of students who are research subjects

The interpretation of scores for each aspect is based on the intervals outlined by Riduwan (2015), as follows:

Table 2. Likert scale assessment rubric

Interval score	Category
0% - 20%	Strongly disagree
21% - 40%	Disagree
41% - 60%	Neutral
61% - 80%	Agree
81% - 100%	Strongly agree

The steps in the research include the following:

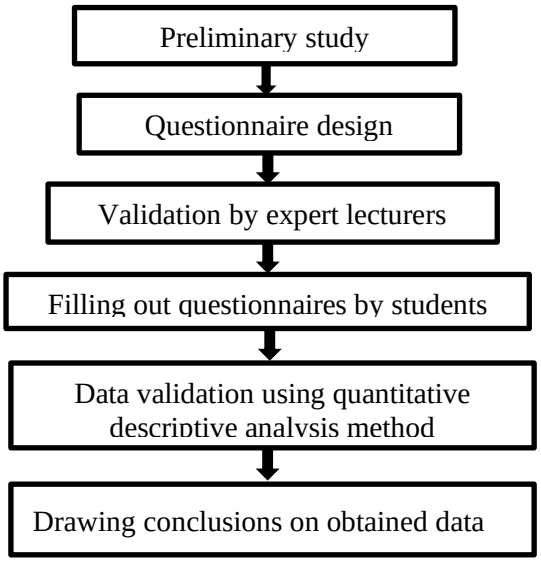

Figure 1. Research steps

III. RESULTS AND DISCUSSION

This study analyzed data on the perceptions of Physics Education students at Cenderawasih University regarding the use of EveryCircuit-based Virtual Laboratories for dynamic electrical materials through a questionnaire instrument. A total of 16 students participated in the study, with four aspects assessed. These four specs include:

1. Aspects of Material Comprehensibility

This aspect aimed to measure students' mastery of dynamic electricity concepts after using the EveryCircuit-based Virtual Laboratory. Sixteen students provided their opinions on five statements in this aspect. The statements given to the students can be seen in the following table:

Table 3. Statement of material understandability aspects

Number	Question
1	I feel that having a Virtual Laboratory based on EveryCircuit can help understand Dynamic Electricity material
2	I can easily understand Dynamic Electricity material when using the EveryCircuit Based Virtual Laboratory
3	I can practice well regarding Dynamic Electricity after using the EveryCircuit Based Virtual Laboratory application
4	I felt helped in assembling tools on Dynamic Electrical material after using the EveryCircuit Based Virtual Laboratory application
5	I found it helpful to understand how laboratory equipment works, especially regarding electricity, after using the EveryCircuit-Based Virtual Laboratory application

Table 3 above is a statement filled in by 16 students. After students fill in/give their opinions by ticking/checking Strongly disagree, disagree, neutral, agree and strongly agree, then the results are analyzed, and we can see them in the following table:

Table 4. Data on material comprehension results

Number	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	12.50%	18.75 %	12.50 %	37.50 %	18.75 %
2	6.25%	12.50 %	12.50 %	43.75 %	25.00 %
3	0.00%	6.25 %	18.75 %	56.25 %	18.75 %
4	12.50%	6.25 %	6.25 %	43.75 %	31.25 %
5	6.25%	12.50 %	12.75 %	31.25 %	37.50 %

Table 4 presents the analysis of students' responses to statements related to their understanding of the material after using the EveryCircuit-based Virtual Laboratory. The statements were given in a total of 5 statements where the first statement stated that "I feel that the EveryCircuit-based Virtual Laboratory can help understand Dynamic Electrical material". From this question, there were 12.50% of students who Strongly Disagree, 18.75% of students who Disagree, 12.50% who Neutral, 37.50% who Agree and 18.75% who Strongly Agree. Meanwhile, the second statement states that "I can easily understand Dynamic Electrical material when using the EveryCircuit Based Virtual Laboratory" from this statement 6.25% strongly disagree, 12.50% disagree, 12.50% neutral, 43.75% agree, 25.00% Strongly Agree. Then for statement 3 which reads "I can practice well regarding Dynamic Electricity after using the EveryCircuit Based Virtual Laboratory application", there are 0.00% who Strongly Disagree, 6.25% who Disagree, 18.75% who neutral, 56.25% who Agree, 18.75 % Strongly Agree. For the 4th statement with the sound "I feel helped in assembling tools on Dynamic Electrical material after using the EveryCircuit Based Virtual Laboratory application", 12.50% strongly disagree, 6.25% disagree, 6.25% neutral, 43.75% agree, 31.25% Strongly Agree. And for statement 5 which reads "I feel helped in understanding how laboratory equipment works, especially regarding electricity after using the EveryCircuit Based Virtual Laboratory application" there are 6.25% who strongly disagree, 12.50% who disagree, 12.75% who neutral, 31.25% those who Agree, 27.50% Strongly Agree.

After the results of student work are analyzed using equation (1), they are then averaged so that we can see the average percentage of students who Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree on each given aspect. For the aspect of understanding the material, there were 7.50% who Strongly Disagree, 11.25% who Disagree, 12.55% who Neutral, 42.50% who Agree and 26.25 who Strongly Agree. For more details, see the diagram below:

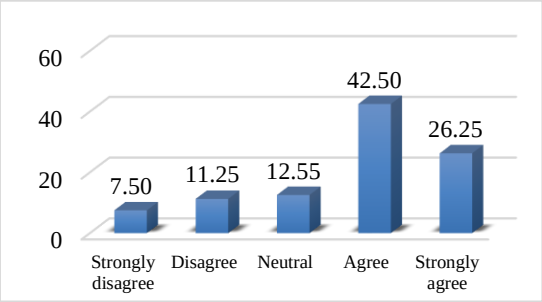

Figure 2. Average percentage of students on the aspect of understanding the material

The figure above shows that in the aspect of understanding the material, most of the students answered in the affirmative, meaning that most of the students had understood the dynamic electricity material using the EveryCircuit-based Virtual Laboratory. After we measure the understanding of the material, we next look at the aspects of using the EveryCircuit-Based Virtual Laboratory.

2. Aspects of Using EveryCircuit-Based Virtual Laboratory

This aspect aimed to capture students' perceptions of using the EveryCircuit-based Virtual Laboratory for dynamic electricity material. In this aspect, students fill in/give opinions regarding 4 points regarding the use of the EveryCircuit-Based Virtual Laboratory. These statements can be seen in the following table:

Table 5. lists questions aspects of using everycircuit-based virtual laboratory

Number	Question
1	I can easily use the EveryCircuit based Virtual Laboratory application
2	All components needed to make a circuit in Dynamic Electrical material are available in EveryCircuit
3	I know the components in EveryCircuit that are needed for Dynamic Electrical material
4	I can easily create circuits and run simulations in EveryCircuit

The table above is a statement filled in by respondents with opinions of Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree. So the following results are obtained:

Table 6. Data on the results of using everycircuit-based virtual laboratory

Number	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	6.25 %	6.25 %	12.50 %	43.75 %	31.25 %
2	0.00 %	18.75 %	6.25 %	56.25 %	18.75 %
3	0.00 %	6.25 %	12.50 %	50.00 %	31.25 %
4	6.25 %	6.25 %	25.00 %	37.50 %	25.00 %

Table 6 above is a table of analysis results from research related to the use of the EveryCircuit-based Virtual Laboratory in Dynamic Electrical material. The list of statements consists of 4 statements where based on the research results, for statement 1 there are 6.25% who Strongly Disagree, 6.25% who Disagree, 12.50% who Neutral, 43.75% who Agree, 31.25% who Strongly Agree. Then for the second statement, 0.00% strongly disagree, 18.75% disagree, 6.25% neutral, 56.25% agree, 18.75% strongly agree. Meanwhile for the third statement, 0.00% strongly disagree, 6.25% disagree, 12.50% neutral, 50.00% agree, 31.25% strongly agree. And for the fourth statement, there are 6.25% who Strongly Disagree, 6.25% who Disagree, 25.00% who Neutral, 37.50% who Agree, 25.00% who Strongly Agree.

After the data/results of student work are analyzed using equation (1) they are then averaged so that we can see the average percentage of students who Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree on each given aspect. For the aspect of using EveryCircuit-Based Virtual Laboratory, there are 3.125% who Strongly Disagree, 9.375% who Disagree, 14.062% who Neutral, 46.875,

who Agree and 26.562 who Strongly Agree. For more details, see the diagram below:

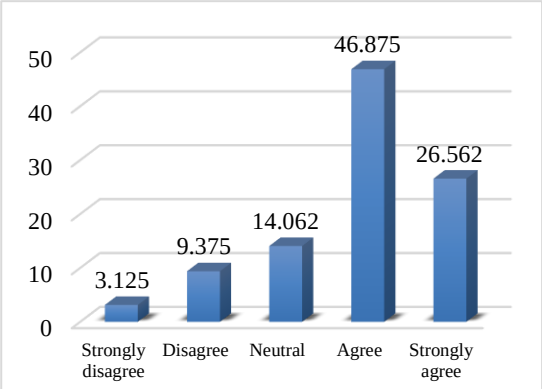

Figure 3. Average percentage of students on aspects of using the everycircuit-based virtual laboratory

The figure above shows that in the aspect of using the EveryCircuit-based Virtual Laboratory, the majority of students answered in the affirmative, meaning that the majority of students agreed with the use of the EveryCircuit-based Virtual Laboratory, namely on dynamic electricity material.

3. Motivational and Skills Aspects

This aspect assessed students' motivation and skills in utilizing the EveryCircuit-based Virtual Laboratory. In this aspect, students give their opinions on 10 point statements. These statements can be seen in the following table:

Table 7. Lists the motivational and skills aspect statements

Number	Question
1	I feel interested and happy to complete the practicum using EveryCircuit
2	I enjoyed working with a group to complete the Dynamic Electricity practicum, using EveryCircuit
3	I liked the practicum carried out on the subject of Dynamic Electricity using EveryCircuit
4	Doing Dynamic Electricity practicum using EveryCircuit made me more motivated than direct practicum using equipment in the laboratory
5	Dynamic Electricity Practicum with the help of EveryCircuit motivated me to do other practicums.
6	Practicum with the help of EveryCircuit, made me feel like trying again with other materials
7	I felt happy doing practicum with the help of EveryCircuit
8	I feel skilled in assembling tools with the help of EveryCircuit
9	I feel proud that EveryCircuit exists so that I can assemble equipment properly and correctly
10	I feel happy with EveryCircuit, so it is easy to set up Dynamic Electrical experiments

The table above is a list of statements filled in by students with the opinions of Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree. After the data has been filled in, it is then analyzed so that the results in the following table are obtained.

Table 8. Data on motivation and skills results

Number	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	0.00 %	12.50 %	12.50 %	50.00 %	25.00 %
2	0.00 %	18.75 %	12.50 %	43.75 %	25.00 %
3	0.00 %	12.50 %	25.00 %	37.50 %	25.00 %
4	6.25 %	12.50 %	12.50 %	37.50 %	31.25 %
5	0.00 %	6.25 %	18.75 %	43.75 %	31.25 %
6	0.00 %	12.50 %	12.50 %	50.00 %	25.00 %
7	0.00 %	0.00 %	18.75 %	56.25 %	25.00 %
8	6.25 %	12.50 %	12.50 %	50.00 %	18.75 %
9	6.25 %	18.75 %	18.75 %	31.25 %	25.00 %
10	0.00 %	12.50 %	18.75 %	37.50 %	31.25 %

The table above presents data analyzing student motivation and skills after using the EveryCircuit-based Virtual Laboratory. This aspect included 10 statements, completed by 16 respondents. In statement 1 there are 0.00% who Strongly Disagree, 12.50% who Disagree, 12.50% who Neutral, 50.00% who Agree, 25.00% who Strongly Agree. Then in the second statement there were also 0% who Strongly Disagree, 18.75% who Disagree, 12.50% who Neutral, 43.75% who Agree, 25.00% who Strongly Agree. For the third statement, there are 0.00% who Strongly Disagree, 12.50% who Disagree, 25.00% who Neutral, 37.50% who Agree, 25.00% who Strongly Agree. For the fourth statement, there were 6.25% who Strongly Disagree, 12.50% who Disagree, 12.50% who Neutral, 37.50% who Agree, 31.25% who Strongly Agree. For the fifth statement, there are 0.00% who strongly disagree, 6.25% who disagree, 18.75% who neutral, 43.75% who agree, 31.25% who strongly agree. For the sixth statement, there are 0.00% who strongly disagree, 12.50% who disagree, 12.50% who neutral, 50.00% who agree, 25.00% who strongly agree. For the seventh statement, 0.00% strongly disagree, 0.00% disagree, 18.75% neutral, 56.25% agree, 25.00% strongly agree. For the eighth statement, 6.25% strongly disagree, 12.50% disagree, 12.50% neutral, 50.00% agree, 18.75% strongly agree. Meanwhile, for the 19th statement, there were 6.25% who Strongly Disagree, 118.75% who Disagree, 18.75% who Neutral, 37.50% who Agree, 31.25% who Strongly Agree. And for the tenth statement there are 0.00% who Strongly Disagree, 12.50% who Disagree, 18.75% who Neutral, 37.50% who Agree, 31.25% who Strongly Agree.

After the results of student work are analyzed using equation (1), they are then averaged so that we can see the average percentage of students who Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree on each given aspect. For the aspect of using EveryCircuit-Based Virtual Laboratory, there are 1.87% who Strongly Disagree, 11.87% who Disagree, 16.25% who Neutral, 43.75% who Agree and 26.25 who Strongly Agree. For more details, see the diagram below:

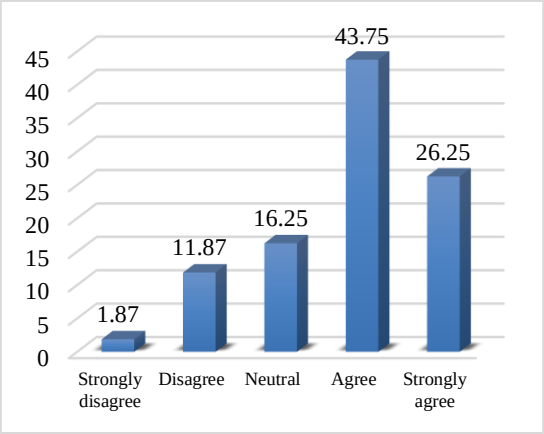

Figure 3. Average percentage of students on the motivation and skills aspects

The analysis confirms that most students reported positive motivation and demonstrated skills in using the EveryCircuit-based Virtual Laboratory.

The aspect of understanding the material included five statements provided to respondents. With the aim of seeing how many people or what percentage of students strongly disagree, disagree, neutral, agree and strongly agree with the EveryCircuit-based virtual laboratory. And after being given to 16 students, the first statement read: I feel that the Virtual Laboratory based on EveryCircuit can help understand the material on Dynamic Electricity. There were 2 people who strongly disagreed, 3 people disagreed, 2 people neutral, agreed. 6 people, and 3 people who Strongly Agree. Then for the second statement, namely "I can easily understand Dynamic Electrical material when using the EveryCircuit Based Virtual Laboratory" from this statement 1 person strongly disagrees, 2 people disagree, 2 people neutral, 7 people agree, and 4 people disagree. people who Strongly Agree. Then for statement 3 which reads "I can practice well regarding Dynamic Electricity after using the EveryCircuit Based Virtual Laboratory application", there are 0 who Strongly Disagree/no one strongly disagrees, 1 person who Disagrees, 3 people who Neutral, people who Agree, 3 people who Strongly Agree. For the 4th statement with the sound "I feel helped in assembling tools on Dynamic Electrical material after using the EveryCircuit Based Virtual Laboratory application", 2 people strongly disagree, 1 person disagrees, 1 person neutral, 7 people agree, 5 people who Strongly Agree. And for statement 5 which reads "I feel helped by understanding how laboratory equipment works, especially regarding electricity after using the EveryCircuit Based Virtual Laboratory application" there is 1 person who Strongly Disagrees, 2 people who Disagree, 2 people who neutral, 5 people those who Agree, 6 people who Strongly Agree.

The data analysis indicates that most students agreed that the EveryCircuit-based virtual laboratory was beneficial for understanding Dynamic Electricity material. Because at every point, many students understand Dynamic Electricity material with the help of the EveryCircuit Based Virtual Laboratory.

For the aspect of using the EveryCircuit-based Virtual Laboratory, four statements were provided to 16 respondents. Where in the first statement "I can easily use the EveryCircuit-based Virtual Laboratory

application" there is 1 person who Strongly Disagrees, 1 person Disagrees, 2 people Neutral, 7 people Agree, and 5 people who Strongly Agree. Then for the second statement, namely "All the components needed to make a circuit in Dynamic Electrical material are available in EveryCircuit" from this statement there are no people who Strongly Disagree, 3 people who Disagree, 1 person who Neutral, 9 people who Agree, and 3 people who Disagree. people who Strongly Agree. Then for statement 3 which reads "I know the components in EveryCircuit that are needed for Dynamic Electrical material", no one strongly disagreed, 1 person disagreed, 2 people neutral, 8 people agreed, and 5 people disagreed. Strongly agree. And for the 4th statement with the words "I can easily create circuits and run simulations in EveryCircuit" there is 1 person who Strongly Disagrees, 1 person who Disagrees, 4 people who Neutral, 6 people who Agree, and 4 people who Strongly Agree.

The analysis indicates that most students agree on the usefulness of the EveryCircuit-based virtual laboratory for learning Dynamic Electricity material. Because at every point, many students have mastered it.

The Motivation and Skills aspect included ten statements, completed by 16 respondents. Where in the first statement "I feel interested and happy to complete the practicum using Every Circuit" there were no respondents who Strongly Disagree, 2 people Disagree, 2 people Neutral, 8 people Agree, and 4 people Strongly Agree. For the second statement, namely "I am happy to work with a group to complete the Dynamic Electricity practicum, using Every Circuit" from this statement there were no respondents who Strongly Disagree, 3 people who Disagree, 2 people who Neutral, 7 people who Agree, and 4 people who Strongly Agree. For statement 3 which reads "I like the practicum carried out on the subject of Dynamic Electricity using Every Circuit", where there are no respondents who Strongly Disagree, 2 people who Disagree, 4 people who Neutral, 6 people who Agree, and 4 people who Strongly Agree. For the 4th statement which reads "Doing Dynamic Electrical practicum using EveryCircuit makes me more motivated than direct practicum using laboratory equipment" where there is 1 person who Strongly.

Disagrees, 2 people who Disagree, 2 people who Neutral, 6 people agree, and 5 people strongly agree. For the fifth statement, namely "Dynamic Electrical Practicum with the help of EveryCircuit motivates me to do other practicums" from this statement there were no respondents who Strongly Disagree, 1 person who Disagree, 3 people who Neutral, 7 people who Agree, and 5 people people who Strongly Agree.

The findings indicate that most students agreed on the motivation and skills aspect, highlighting the positive influence of the EveryCircuit-based Virtual Laboratory on Dynamic Electricity material. Because at every point, many students are motivated by

using the EveryCircuit-Based Virtual Laboratory on Dynamic Electricity material.

For the sixth statement, namely "Practicum with the help of Every Circuit, made me feel like trying it again with other materials" from this statement there were no respondents who Strongly Disagree, 2 people Disagree, 2 people Neutral, 8 people Agree, and 4 people who Strongly Agree. For the seventh statement, namely "I feel happy doing practicum with the help of Every Circuit", from this statement there were no respondents who Strongly Disagree, there were no respondents who Disagree, 3 people Neutral, 9 people Agree, and 4 people who Strongly agree. For the eighth statement, namely "I feel skilled in assembling tools with the help of EveryCircuit" from this statement, 1 person strongly disagrees, 2 people disagree, 2 people neutral, 8 people agree, and 4 people strongly agree. Meanwhile, for the ninth statement, namely "I feel proud of the existence of EveryCircuit so that I can assemble devices properly and correctly" from this statement there is 1 person who Strongly Disagrees, 3 people who Disagree, 3 people who Neutral, 5 people who Agree, and 4 people who Strongly Agree. And for the tenth statement, namely "I feel happy with EveryCircuit, so it is easy to set up Dynamic Electrical experiments" from this statement there were no respondents who Strongly Disagree, 2 people who Disagree, 3 people who Neutral, 6 people who Agree, and 5 people who strongly agree.

This research aligns with prior studies, such as Rahman & Sudarmono (2020), which found virtual laboratories and the EveryCircuit application to be highly effective for learning, Similarly, Sari et al. (2016) reported that virtual laboratories improved students' mastery of concepts. Prasetya & Wiryanto (2019) also highlighted the effectiveness of EveryCircuit in developing physics teaching modules.

The implications of this research suggest that using EveryCircuit-based virtual laboratories creates a positive and motivating environment for students during practicums, particularly for Dynamic Electricity material. Furthermore, the EveryCircuit application reduces student boredom often associated with traditional laboratory practicums.

IV. CONCLUSION AND SUGGESTION

Based on the data analysis, it can be concluded that physics education students at Cenderawasih University have positive perceptions of the EveryCircuit-based Virtual Laboratory for Dynamic Electricity material and agree with its use. However, improvements are needed in certain aspects of learning. In particular, the motivation and skills aspect require enhancement. The average responses for each aspect were as follows: material comprehension at 42.50% (Agree), use of the EveryCircuit-based Virtual Laboratory at 46.87% (Agree), and motivation and skills at 43.75% (Agree). These findings can serve as a foundation for selecting learning

media for simulations using the EveryCircuit-based Virtual Laboratory, especially in the Physics Education Department, while addressing identified shortcomings. One limitation of this study is that some students in the UNCEN Physics Education program are not yet proficient in using the EveryCircuit-based Virtual Laboratory. This may be attributed to a lack of foundational knowledge in electricity among students. Thus, further research is needed to address this issue.

It is recommended that lecturers/ educators utilize the EveryCircuit-based Virtual Laboratory in locations with reliable WiFi to reduce student burden. Ideally, sessions involving EveryCircuit-based virtual laboratory media should be conducted in a computer laboratory to optimize learning.

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