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Analysis of Interactive Learning Media Needs for Computer Network Installation in Grade X SMK

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Abstract
This study analyzes students perceptions of using interactive multimedia in Computer Network Installation learning. A quantitative descriptive method was employed, using questionnaires completed by 40 students enrolled in the course. Results indicate that most students support the use of interactive multimedia, mainly because it displays engaging objects (25.0%) and facilitates learning (17.5%). Additionally, 12.5% found the media attractive and appreciated that it does not require internet access. Smaller percentages noted benefits such as talent development and keeping up with technology (7.5% each). However, challenges were also identified, with 70.0% of students reporting difficulties in understanding how to use the media and 25.0% citing limitations due to their phone specifications. Only 5.0% reported no challenges. Overall, interactive multimedia received positive feedback, particularly for enhancing material visualization and easing learning. To address challenges, it is recommended to provide clear training on media use before implementation and to design multimedia compatible with students devices.

Keywords
computer network; interactive learning; need analysis

INTRODUCTION

Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-recognition, personality, intelligence, noble character and skills needed for themselves, society, nation and state (Duran et al., 2024; Vaganova et al., 2020). Education thus implies that education is an effort to create devoted and skilled citizens. In achieving this, learning activities are organized both formally and non-formally at various levels.

Starting from early childhood education to higher education. The development of science and technology has brought positive changes in the world of education.

The demand for the need to improve the quality and quality of education is getting higher, therefore human resources must be improved along with the development of technology and information (Haleem et al., 2022; Huang, 2021; Maryati et al., 2024). Efforts to improve the quality of education are very complex activities and require a technique in teaching and media used as an effort to realize these efforts. The development of computer device technology and applications in all fields requires many parties to pay special attention to it. Mastery of this technology is one thing that the younger generation needs to have now (Reza & Tinggogoy, 2022). The demands of the globalization era with the development of information technology can be utilized for learning development.

One way of using technology in learning is the use of technological resources as media in the learning process (Samala et al., 2024; Presetya et al., 2025). According to Wahyuni & Fitriana (2021) learning is a process of interaction between learners and their environment so that there is a change in behavior towards the better. For this reason, learning requires good communication in channeling messages. In today's sophisticated learning system, students not only act as communicants or recipients of messages, but reversing functions, students act as communicators or messengers. In this condition, there will be two-way communication. A learning activity requires appropriate learning media to increase effectiveness in achieving competencies or goals to be achieved.

In the learning process, the presence of learning media can arouse new desires and interests, increase motivation and stimulation (Magdalena et al., 2021; Wulandari et al., 2023; Puspita & Irfandi, 2022). Learning media is one of the elements that plays an important role in the learning process. Permatasari & Ekohariadi (2023) states that the use of computer-assisted learning media has a significant influence on student attractiveness to learn the competencies taught. The use of learning media can save teaching preparation time, increase student learning motivation, and reduce student misunderstanding of the explanation given by the teacher. For example, interactive multimedia based learning media is expected to make it easier for teachers to deliver material. Multimedia is a collection of several elements such as text, images, audio, video, graphics, and animation (Razali et al., 2023; Handoyo et al., 2024; Arbi & Juhana, 2024) By developing learning media, so as to produce a quality interactive learning media, and easily understood by

students, so that learning objectives can be achieved properly. The advantages displayed by multimedia, especially by using computers, are high student interactivity with various learning resources. The combination of various media that fully utilizes the senses of the viewer and the listener is able to attract memorable learning. In this case, multimedia technology only acts as a complement, addition or tool for the teacher. Multimedia does not take the place and task of the teacher, but multimedia is used as a channel of choice in conveying information in a more memorable way (Vagg et al., 2020; Ramgadwala, 2024).

Based on the results of observations made by researchers with the Basic Network and Computer subject teacher of class X SMK LKIA Pontianak, the results showed that the teacher's role was very dominating. The teacher explains the material using the lecture method. Students are obliged to pay attention to the teacher's explanation, write down the material and ask questions that have not been understood. However, these obligations are not fully implemented due to various student responses such as talking to friends, sleeping, and playing. Some students seemed enthusiastic about learning, while others seemed less enthusiastic. Teachers have difficulty in explaining material, one of which is computer network installation material which cannot be explained verbally alone. Teachers need appropriate and interesting learning media in the learning process to make learning more effective. Previously the teacher only used book media and student worksheets (LKS) with the learning system carried out was listening to explanations from the teacher (lecture), and in the laboratory or classroom only limited to media that was still simple in nature such as passive images. And also based on observations and interviews conducted with several students stated that learning media is needed because learning is much more effective and interesting and students can utilize the media as a means of individual learning. Learning media is also very useful in terms of facilitating students in learning and making the learning process more interactive, effective, efficient, and interesting. For this reason, it is necessary to strive for learning by using learning media that leads to the development of skills and knowledge that can foster student innovation.

To solve the above problems, it is necessary to modify the learning media for computer network installation material that can make students more motivated and enjoyable in learning. An effective learning approach that can motivate students to learn, among others, can be used animation with Adobe Flash CS6. Understanding Adobe Flash CS6 is one software that is able to do things related to multimedia (Putri, 2022; Nasution

et al., 2024; Handayani et al., 2024). Flash performance can also be combined with other programs, Flash can be applied to create cartoon animations, interactive animations, animation effects, advertising banners, websites, games, presentations, and so on. The advantage of Adobe Flash CS6 is that it can easily combine several symbols and animations into better and more interesting workflow sheets (Putri, 2022; Cahya et al., 2020; Harun & Fitria, 2023).

Based on this explanation, the use of Adobe Flash CS6 will be suitable for use as one of the solutions to problems in learning Computer Network Installation material. This study aims to determine how the analysis of the needs of Interactive Multimedia Learning Media in Computer Network Installation Materials in Class X of SMK LKIA Pontianak. The impact of this research is expected to be used as a reference, information and new discourse in increasing knowledge and insight, especially about the development of interactive multimedia learning media for other researchers who want to conduct similar research. Practical impact of research (a) For Researchers: To increase the knowledge and insight of researchers in developing creative and interesting interactive multimedia learning media. (b) For Students: The existence of this interactive multimedia learning media is a reference in the learning process in class or independently at home so that it can improve student responses in learning. (c) For Schools: It is hoped that this research can provide input for schools to use interactive multimedia learning media or other interactive media.

METHOD

The type of research is descriptive quantitative using survey method (Brasel, 2020). The research was conducted at SMK LKIA Pontianak. The subjects of this study were class X students majoring in Computer and Network Technology (TKJ). Data collection techniques using indirect communication techniques. The data collection tool is a questionnaire. Questionnaires were given to students who were respondents in the study.

Before being given a questionnaire, to equalize perceptions about interactive learning multimedia for learning, respondents were first demonstrated a sample of interactive learning multimedia that would be used for learning activities. The demonstration of interactive learning media given is related to Computer Network Installation material. After the demonstration, respondents were invited to try the learning

multimedia. Respondents are also given an explanation of the various types of presentation formats in the learning multimedia program.

After the interactive multimedia was demonstrated and the respondents had tried the multimedia, the respondents were given a questionnaire containing questions about the needs required for the development of interactive multimedia. The data collected was analyzed descriptively quantitatively by grouping the respondents' answers and giving the percentage of the answer group.

RESULT AND DISCUSSION

Data is obtained from questionnaires that have been answered by respondents. The questionnaire used is a combination of closed and open questions. Question number 1 (one) is closed with 2 (two) answer options, namely “Yes” and “No”. Question number 2 (two) is combined, namely the answer options “Yes” and “No” accompanied by the reason why the respondent chose ‘Yes’ or “No”. Question number 3 (three) is open-ended. The following is an explanation of the results of the analysis of the data obtained.

Question Number 1: Do you have a smartphone with the Android operating system?

Based on the respondents' answers to question number 1, the data shows that out of 40 respondents, 38 respondents have smartphones with the Android operating system, while 2 respondents do not have smartphones with the Android operating system. This means that 95% of respondents have smartphones with the Android operating system.

Question Number 2: Do you agree if the Computer Network Installation Material uses Interactive Multimedia?

Based on the respondents' answers to question number 2, it was found that out of 40 respondents, none disagreed if the Computer Network Installation material used interactive multimedia. This means that 100% of respondents agree if the Computer Network Installation material uses interactive multimedia. The reasons why respondents agree that Computer Network Installation materials should use interactive multimedia can be seen in the following table 1.

Table 1. Reasons Why Respondents Agree to Use Interactive Multimedia for Computer Network Installation Materials

No	Reason	Number of Respondents	Percentage
1	Attractive object display	10 People	25.0%
2	Facilitates the learning process	7 People	17.5%
3	Does not require internet access	5 People	12.5%
4	The learning media is engaging	5 People	12.5%
5	Talent development	3 People	7.5%
6	Keeping up with technological developments	3 People	7.5%
7	Acquiring new knowledge	2 People	5.0%
8	Increasing learning motivation	2 People	5.0%
9	Accelerates material understanding	2 People	5.0%
10	Can study anywhere and anytime	2 People	5.0%
	Total	40 People	100.0%

Table 1 shows the reasons respondents agree if the Computer Network Installation material uses interactive multimedia. From the results of the questionnaire given to 40 respondents, various reasons were obtained with varying percentages. The most common reason given by respondents is the ability of interactive multimedia to display interesting objects, with a percentage of 25.0% (10 people). This shows that interactive visual features are the main attraction in using multimedia in Computer Network Installation material. The second most chosen reason is the ease of the learning process, with a percentage of 17.5% (7 people). This shows that respondents feel the direct benefits of interactive multimedia in understanding the material. The third reason is that it does not require internet access and the learning media is attractive, each chosen by 5 people or 12.5%. This indicates that respondents appreciate the independence in learning without relying on the internet and the visual appeal of the multimedia. Furthermore, reasons related to talent development and keeping up with technological developments were each chosen by 3 people or 7.5%. This shows that some respondents consider the use of interactive multimedia as a way to improve skills and be in tune with technological developments. Other reasons, such as gaining new knowledge, increasing learning motivation, accelerating understanding of material, and being able to learn anywhere and anytime, were each chosen by 2 people or 5.0%. Although the percentages are smaller, these reasons show that interactive multimedia also contributes to flexibility and increased motivation in learning. Overall, the data in the table shows that the interactive multimedia for Computer Network Installation materials received positive support from respondents. The majority of respondents appreciated the rich visual features as well as the convenience offered, so interactive multimedia can be considered an effective and engaging learning tool.

Question Number 3**:** If you answered "Yes" to Question Number 2, what challenges might you face if interactive multimedia is implemented?

The respondents' answers to question number 3 can be seen in the following table 2.

Table 2. Challenges That Students Might Face in Implementing Interactive Multimedia

No	Reason	Number of Respondents	Percentage
1	Lack of understanding in using the media	28 People	70.0%
2	Incompatible phone specifications	10 People	25.0%
3	No challenges	2 People	5.0%
	Total	40 People	100.0%

The data in Table 2 shows that the most likely challenge when implementing interactive multimedia is that students lack understanding in using the media, with a percentage of 70.0% (28 people). Therefore, researchers must provide clear guidelines on how to use interactive multimedia and give examples of correct usage to students.

The second potential challenge is the incompatibility of phone specifications, reported by 25.0% (10 people) of respondents. To address this, researchers will design interactive multimedia based on the smartphone specifications owned by the students, while striving to maintain the quality of the interactive multimedia. A small portion of respondents, 5.0% (2 people), stated that there are no challenges in implementing interactive multimedia.

CONCLUSION

This study was conducted with the aim of analyzing student perceptions of the application of interactive multimedia in learning Computer Network Installation, in order to determine its effect in increasing understanding and motivation to learn. The results showed that the use of interactive multimedia significantly facilitated the learning process and increased the attractiveness of the material, making it effective in solving the problem of low student motivation and understanding, in line with the findings of Geni et al (2020) which showed positive student perceptions of the use of augmented reality in learning. The impact of this study is the recommendation to provide training on the use of media and to adapt multimedia design to student devices so that technical constraints can be minimized. The advantage of this study over previous studies lies in its focus on the application of interactive multimedia that does not require internet access and is compatible with various devices, making it more practical and easy to implement in real learning environments. It

is hoped that future research can develop more adaptive and comprehensive multimedia and quantitatively test its impact on learning outcomes. The implications of this study emphasize the importance of institutional support in providing facilities and training so that the implementation of interactive multimedia can run optimally and sustainably.

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