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IMPLEMENTATION OF MEDIA INTERACTIVE LEARNING BASED WLAN TECHNOLOGY (STUDY AT SMK KAMPAR)

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ABSTRACT: Information and communication technology in education is growing rapidly. Computer network technology, the Internet and multimedia strongly supports the development of education in distributing information quickly. However, some vocational schools have not fully utilised the potential of this technology to improve the quality of learning.The research objective is to study the implementation of interactive learning media physics based WLAN technology and to analyze the effectiveness of the learning media as a way to increase the motivation of students majoring in computer engineering at SMK YPTK and at SMK Bina Insan in Kampar regency. Qualityof service(QoS) assessment of the learning system implemented already reliable. The average assessment results of student satisfaction in the use of interactive learning media is good (75.15). Learning system can also help teachers to manage learning effectively and thus increase student motivation (The positive learning activities of students increased by 17.45% in vocational YPTK and 23.70% at SMK Bina Insan).

Keywords: Implementation, Learning systems, Interactive media, WLAN technology, Motivation

1. INTRODUCTION

The development of science and Information Communication Technology (ICT) in education has the potential to improve the quality of education.

Wireless local area network (WLAN) technology can be implemented to support the learning process at school. This enables teachers to send information education (educational applications, multimedia applications, audio-visual applications, and video) in real time to students. As a result, teachers can manage the classroom more flexible, and lead to a more effective and efficient the learning process.

Indonesian national education standards policy[10]-[11], states that the management and the learning process should be interactive, inspiring, and motivating for learners so that they can participate actively, creatively, and independently according to their talents, interests, physical and psychological development.

2. THE PREVIOUS LITERATURE

The learning environment influences the motivation to learn, and subsequently affect learning outcomes. Learning systems that occupy educational technology and educational media to produce a comfortable learning atmosphere will improve learning motivation.

Keller[5]-[6], have investigated that motivation to learn can be determined based on the attention, relevance, confidence, and student satisfaction (ARCS motivational model).

Motivation to learn should be built and raised as a psychic driving force students to learn. Positive motivation can generate interest, attention and hardwork of students in learning. Cahyono[2] have investigated several benefits of the use of web-based interactive media to increase positive motivation and learning outcomes.

The traditional learning methods can be combined with online learning (e-learning) to construct active learning. Koohang[8], DeNigris[4], and Perlman[9], found that active learning creates the learning environment that insists on reinforcing higher-order thinking skills. Active learning provides learners the opportunity to create knowledge in the term of social negotiation. Learners obtain deep learning experience, expertise, and ability to work in the industry.

WLAN networks can be implemented to support blended learning. WLAN have been utilized to support video applications such as video streaming, multimedia messaging, teleconferencing, voice over internet protocol (VoIP), video telemedicine, and educational video. Educational and training video can be shared via WLAN from the server to the client. Students can access educational applications using wireless devices such as tablet/smartphone anywhere, anytime as long as there is availability of network services.

Putra[12], Soyinka[13], and Sugesti[14] have encountered that WLAN has superior characteristics compared to other wireless standards, mobility, high data rate, easy to implement and low cost.

Abdel-Gawad[1] have studied that the implementation of e-learning and blended learning can make learning process more effective and efficient.

3. STATEMENT OF THE PROBLEM

The school has insfrastuktur LAN network that supports to realize the implementation of learning in the classroom. In fact, the technology has not been optimally used in the learning process. For example in learning physics. Physics is a science that contains many abstract concepts, detailed explanation, and it requires competency logic to understand its contents.

Students must learn physics collaboratively and intensively to develop cognitive skills and creativity. The learning process of physics in the traditional way takes a long time, not interactive and less interaction.

Based on the survey results of the learning process in the classroom, students who have difficulty in learning physics (ideal gas module), causing students to be lazy and bored to study the next topic, so that the students' motivation down.

4. THE PURPOSE OF THE STUDY

This article aims an exploring the effect of utilizing interactive media-based WLAN technology (blended learning) to increase students' motivation.

5. METHODOLOGY

Research models using action research(Fig.1). Action research is unique in the approach, to improve the quality of learning[3].

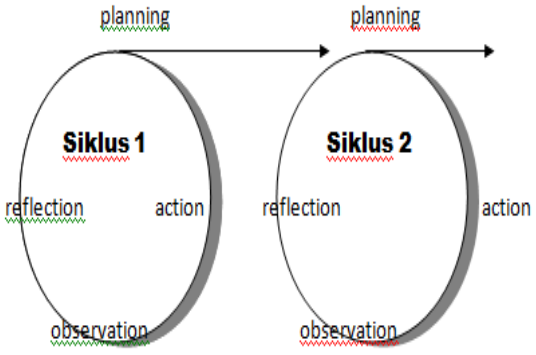

Fig.1 Action Research Model (Kemmis, 1988)

In this design the researchers used an experimental group and a control group. Both groups took a pretest to measure their motivation to learn physics before conducting the experiment.

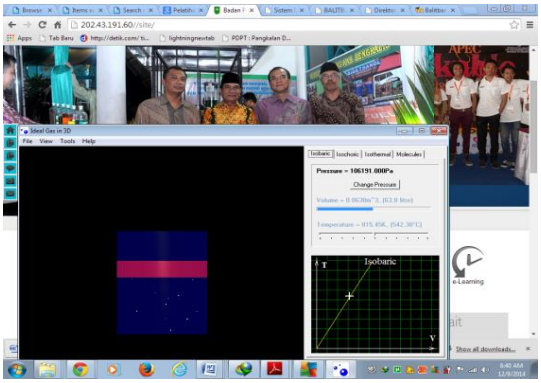

Fig. 2 Interactive media

During the experiment, the experimental groupstudied physics using interactive media (Fig.2) and the control group studied physics using text books.

After the experiment, the same test was administered as a posttest to investigate any significant differences in motivation to learn physics between the two groups.

The sample of the study consisted of 24 students of SMK YPTK Bangkinang (control group), and 24 SMK Bina Insan (experimental group). The study was conducted on students majoring in Computer Network eleventh grade, in Kampar regency.

The technique of collecting data using questionnaires, observation sheets, evaluation test. The data analysis using descriptive analysis of qualitative and quantitative [3].

6. FINDINGS AND DISCUSSION

6.1 Quality of service analysis

Students use computers, laptops, or portable devices (smartphones/tablets) connected to the WLAN network.

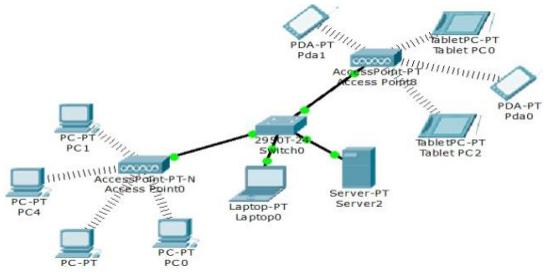

Fig.3 WLAN network

Measurement of network performance serves to validate the Quality of Service (QoS) of an Internet network that is connected to the computer. One way that can be taken to see the QoS parameters of the network is to observe RTT

(Round Trip Time).

Ping is a utility that is used to test the connectivity between network via Transmission Control Protocol/Internet Protocol (TCP/IP) by sending a packet Internet Control Message Protocol (ICMP) to the IP address of the computer. Tests conducted by the ping of 1024 bytes (SMK2.Balitbang.riau.go.id PING -n 200 -l 1024).

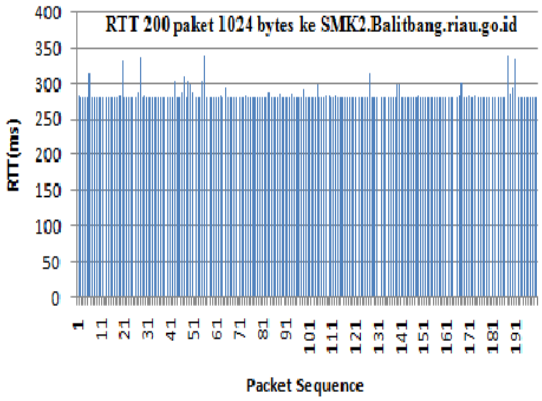

Fig.4 RTT statistics with 200 packets 1024 bytes

In Fig.4, can be seen in statistical data from packet data sent = 200, data is received = 195, missing data = 5 (2% loss). RTT values of 200 packet sequence, the lowest RTT value is at the time of the second packet is 273, the highest RTT value when the packet is 340 to 188 ms, and the average is 285 millisecond(ms). The analysis shows that the performance of the WLAN network learning system implemented is reliable.

Analysis satisfaction assessment students in using learning system, obtaining index of 75.15, which means that the system used to be in the range / criteria of good judgment (62.51- 81.25).

6.2 Analysis of validity and reliability of the questionnaire

Student motivation questionnaire to measure the increase in motivation has been the normality test, validity test and reliability test. Questionnaire interactive physics learning media to measure the effectiveness of learning has been done normality test, validity test and reliability test too.

Software applications of physics interactive learning media has also been validated by some experts in instructional media software.

Table 1 Questionnaire reliability

Instrument	Cronbach's Alpha	N of Items
Media	0.822	9
Motivation	0.642	4

Motivation questionnaire reliability test results show the value of Cronbach's alpha coefficient of 0.642 and questionnaires media interactive learning physics at 0.822. This means that the questionnaire used is reliable.

6.3 The statistical of motivation analysis

The t-test was used to analyze the findings of the study. It was used to test the pretest and the posttest at the ($\alpha = 0.01$) level of significance for the two groups: the control group and the experimental group.

Table 2 The t-value of the difference in the mean scores between the control group and the experimental group on the pretest

Group	N	Mean	Std. Dev	t	Sig(2 tailed
Ctrl	24	60.33	5.062	0.664	0.510
Exp	24	59.42	4.481		

Table 2 shows that the mean score of theexperimental group was 59.42, and the mean score of the control group was 60.33. It also reveals that the difference in the mean scores between the experimental group and the control group was not statistically significant at (α= 0.01). Therefore, it can be implied that the experimental and control groups were homogeneous and equivalent before conducting the experiment, and they were almost similar concerning the students' social and economic status.

6.4 The findings of the main question

What is the effect of the use of interactive media in enhancing the motivation to learn of the experimental group (blended learning) and the control group which studied in the traditional method?

After conducting the experiment, a posttest was administered to the two groups of the study to measure their motivation. The results of the analysis of the posttest scores are shown in Table 3 below.

Table 3 The t-value of the difference in the mean scores between the control group and the experimental group on the posttest

Group	N	Mean	Std. Dev	t	Sig(2 tailed
Ctrl	24	64.79	3.845	-6.318	0.000
Exp	24	70.67	2.444		

The mean score of the experimental group was 70.67, while the control group's mean score was 64.79. It also reveals that the difference in the mean scores between the experimental group and the control group was statistically significant (Sig=0.00). Therefore, the hypothesis of the study was accepted. The effect of the use of interactive media based WLAN can significantly increase motivation to learn.

6.5 Results of observation

Observations aims to monitor and evaluate the learning process.

Fig.5 Activities student (action research)

Fig.5 shows the learning activity (positive motivation) students during two cycles of action research.The active and responsive support services can result in a culture that maintains a positive, helpful, and constructive relationship with students and instructors, thus contributing to the overall success of learning[8].

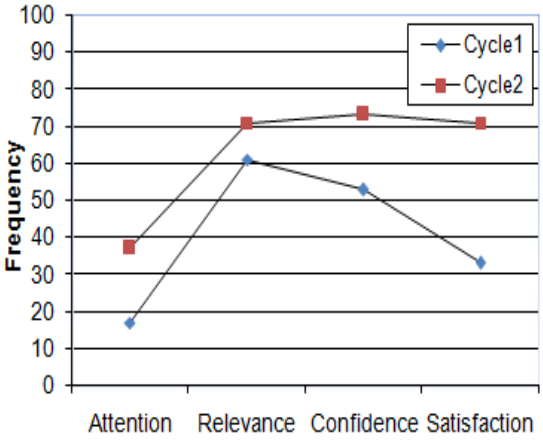

Fig.6 Positive motivation of YPTK students

Fig.6 shows the YPTK student learning activities increased by 17.45% in the learning cycle (35.05% to 52.50%).

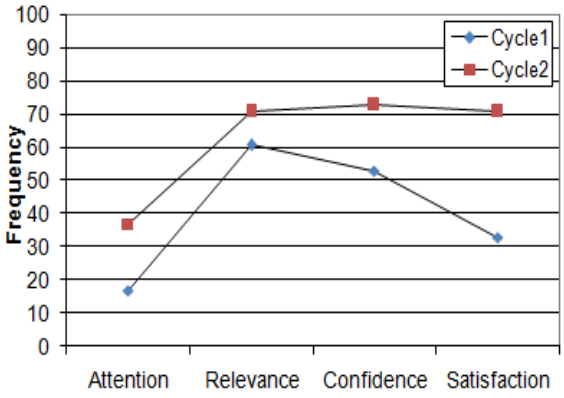

Fig.7 Positive motivation of Bina Insan students

Fig.7shows the Bina Insan student activity increased by 23.70% in the learning cycle (41.67% to 65.36%).

6.6 Learning evaluation results

Results of the evaluation of student learning Bina Insan in cycles of action research shows an increase in the competence of 58.33% with an average value of 77.71.

Table 3 The paired t-test of the difference in the mean scores of learning evaluation results of Bina Insan students.

Bina Insan	N	Mean	Std. Dev	t	Sig(2 tailed
Bef.	24	69.58	5.299	-12.306	0.000
Aft.	24	77.71	5.706		

The data in the table 3 shows that an increase in the average learning outcomes. It means that the motivation determining learning outcomes.

7. CONCLUSION

Implementation of interactive media based Wireless LAN technology is a new innovation in the learning system that combines (blended learning) model of traditional teaching and online learning. This learning system can be applied to groups of classroom learning, and allows teachers to manage classes on distributed learning system centrally.

Learning system has been running optimally, and improve the quality of learning. In general, the

implementation of learning systems has enhanced the learning process and the average student's motivation to learn(positive learning activity increased by 17.45% in vocational students YPTK Bangkinang, and 23.70% in Bina Insan vocational students in Kampar regency).

8. RECOMMENDATIONS

1. In light of the results of the study, the Researchers recommend that teachers should implement a system of learning (educational media innovation, learning methods) and utilizing ICT education so that the learning process more effective and efficient.
2. Moreover, the Indonesian Ministry of Research and Technology and Education is recommended to the make high speed internet facilities more accessible and reliable in all areas of public and private schools.

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