



Pakpahan, Nurmi Frida Dorintan Bertua. (2022). The Effectiveness of Achieve Student Competency Between Learning Using Video-Based Media and Power Points in Environmental Science Courses. *International Online Journal of Education and Teaching (IOJET)*, 9(1). 604-611.

Received : 05.10.2021  
Revised version received : 28. 12.2021  
Accepted : 30.12.2021

## **THE EFFECTIVENESS OF ACHIEVE STUDENT COMPETENCY BETWEEN LEARNING USING VIDEO-BASED MEDIA AND POWER POINTS IN ENVIRONMENTAL SCIENCE COURSES**

Nurmi Frida Dorintan Bertua Pakpahan  (0000-0002-0215-2580).

[nurmipakpahan@unesa.ac.id](mailto:nurmipakpahan@unesa.ac.id)

State University of Surabaya, Surabaya, Indonesia

### **Biodata:**

Nurmi Frida Dorintan Bertua Pakpahan, M.Pd., is an instructor at the Department of Civil Engineering, Faculty of Engineering at the State University of Surabaya. Dr. Nurmi's research interests cover student competency and environmental science.

*Copyright © 2014 by International Online Journal of Education and Teaching (IOJET). ISSN: 2148-225X.*

*Material published and so copyrighted may not be published elsewhere without written permission of IOJET.*

# THE EFFECTIVENESS OF ACHIEVE STUDENT COMPETENCY BETWEEN LEARNING USING VIDEO-BASED MEDIA AND POWER POINTS IN ENVIRONMENTAL SCIENCE COURSES

Nurmi Frida Dorintan Bertua Pakpahan

[nurmipakpahan@unesa.ac.id](mailto:nurmipakpahan@unesa.ac.id)

## Abstract

Environmental problems still require a lot of solutions that need to involve various groups including universities. Through effective environmental education learning, it can have an impact on awareness and achievement of student competencies in Environmental Science courses. The application of learning media by utilizing digital technology is expected to be effective in explaining material on global environmental issues related to human relations with the environment, environmental principles, pollution, utilization of natural resources. The objectives of this study were to: 1) obtain the level of student competence through video-based learning media in the Environmental Science course; 2) obtain the level of student competence with power point learning media; 3) obtain the effectiveness of student competency achievement between learning with video-based media and powerpoint media. This research is a descriptive quantitative study to determine the effectiveness of student competency achievement between video-based media learning and power point media learning. The object of research is video-based learning media and power point learning media in Environmental Science courses. The subjects of this study were a group of students with video-based media learning as many as 30 people and a group of students with power point media learning as many as 32 people. The research instrument is a student competency test (pret-test and post-test) to measure the effectiveness of video-based media compared to power point media after learning Environmental Science material. The test contains 25 multiple-choice questions with a per-item score of 0 or 1 and a score range of 0-100. The results showed: first, the final competence of all students after learning using video-based media was at a high level with an average score of 78.80 75. Second, the final competence of all students after learning using power point media was still at a moderate level, namely with an average score of 72.13 75. Third, the competence of students with learning using video-based media obtained an average score of 78.80 75. The average score of student competence with learning power point media is 72.13 75. That is, the effectiveness of learning using video-based media is higher than using power point media in Environmental Science courses.

**Keywords:** Student Competence, effectiveness, video-based media, power point media

## 1. Introduction

Environmental Science course is a science that studies the environment and studies a systematic study of the environment and the proper position of humans in it. The orientation of Environmental Science material is to study a combination of concepts and various sciences such as ecology, biology, biochemistry, hydrology, oceanography, meteorology, soil science, geography, demography, economics and so on. The learning aims to study and solve problems concerning the relationship between living things and their environment both from the social, economic, and health aspects. The issue of environmental problems has recently hit and become a global concern. Especially in Indonesia, many environmental problems still need to

be resolved. The problem is a multidimensional problem that needs to involve various groups including universities as the spearhead that plays an important role in solving environmental problems. Solving environmental problems is important because the quality of the environment can directly affect the quality of human life now and in the future. Through effective environmental education, it is a process to build a human population in the world who are aware and care about the environment in total and all the problems associated with it, and a society that has the knowledge, skills, attitudes and behavior, motivation and commitment to work together, both individually and collectively, to be able to solve current environmental problems, and prevent new problems from arising (UNESCO, Tbilisi Declaration, 1977).

Implementing environmental education learning effectively can have an impact on optimizing student awareness and achieving competence in Environmental Science courses. The application of appropriate learning media by utilizing digital technology is expected to be effective in explaining material on global environmental issues related to human relations with the environment, environmental principles, pollution, utilization of natural resources. Based on the background that has been described, the following problems can be formulated: 1) what is the level of student competence with video-based media learning in Environmental Science courses?; 2) how is the student's competence with power point media learning in the Environmental Science course?; 3) how is the effectiveness of student competency achievement between learning with video-based media and powerpoint media in Environmental Science courses?

## 2. Literature Review

Learning media is a teacher's tool in teaching (pictures, models, objects and other tools) that can provide concrete experiences, motivation to learn, enhance absorption, and students' memory. In its development, various tools are used to convey messages through sight and hearing to avoid verbalism. Utilization of information technology is always developed for film-based learning, video, multimedia and others. The message is poured in the form of communication symbols (verbal and non-verbal) which is interpreted by the recipient of the message. Communication can be successful thanks to the role of media in learning that can be designed in an integrated manner and classified as audio-visual media in the form of animated images: films, video compact disks (VCD), television (TV) and others. Implementation of learning using electronic technology is very effective in delivering, supporting, and improving teaching, learning and assessment. The main consideration in choosing learning media is to meet learning needs, so that the explanation is more concrete, and more attractive to the recipient of the message. It should be noted that the selection is learning objectives, characteristics of the recipient of the message, the type of message, the reach of the message. As commonly developed in learning today is power point. Power point is a program (software) that offers the convenience of making computer-based audio-visual learning presentation media. Various efforts have been made to create interesting learning presentation media. Gagne and Briggs (1979) explicitly say that learning media includes tools that are physically used to convey the content of teaching materials. Media is a tool used to deliver learning materials. The application of multimedia-based interactive learning media has a very important role to improve the quality of learning. Educators can develop their subject matter with attractive designs, so that they can produce optimal quality of learning targets that are expected by teachers, namely the achievement of student competencies.

According to Mulyasa (2004), competence is a combination of knowledge, skills, values and attitudes that are reflected in the habits of thinking and acting. Competence is to utilize knowledge and work skills in order to achieve optimal performance. Thus, competence is

everything that is owned by a person in the form of knowledge, skills and other individual internal factors to be able to do a job. In other words, competence is the ability to carry out tasks based on the knowledge and skills possessed by each individual. Loy, Dierdonck, and Gemmel (1998) further explain that competence is a human characteristic that is related to performance effectiveness, this characteristic can be seen as a style of acting, behaving, and thinking. The ability or capacity of a person to do various tasks in a job, where this ability is determined by two factors, namely intellectual ability and physical ability. A person's ability or competence is also included in overcoming various problems in their environment.

Various environmental problems in Indonesia and the world must be identified the causes and find solutions. Efforts are needed in the form of the competence of each individual in overcoming critical problems that plague environmental degradation. Solutions are needed for the sustainability and sustainability of human life on earth not to worry. This is because nature is a source of fulfilling all the needs of human life, namely providing air, water, food, health, aesthetics, and others (Soerjani, et al., 1987). Damage to nature means the same as the carrying capacity of human life. Students as future leaders who are active in their environment, must be able to develop their potential in participating in maintaining environmental cleanliness and even managing waste and pollution in their environment.

### **3. Method**

This research includes descriptive quantitative research. The purpose of this study was to determine the effectiveness between the groups with the treatment of video-based media learning and power point media learning. This study aims to describe the data to determine the description or condition of the respondents who became the sample in this study. The object of research is video-based learning media and power point learning media in the Environmental Science course with the scope of the material including: 1) global environmental issues, 2) damage to natural resources and; 3) pollution or pollution. The subjects of this study were a group of students with video-based media learning as many as 30 people and a group of students with power point media learning as many as 32 people who programmed Environmental Science courses.

Video-based learning media was declared very feasible after research on the development of the 4-D model was carried out. Overall, the feasibility of video-based media in the Environmental Science course which was validated by 3 validators obtained an average value of 4.73 with a very decent category. The results of research on student learning outcomes with an average value of 80.17, which can be used as an indicator that this video-based media is very feasible (Pakpahan, 2019).

The research instrument is a student competency test (pret-test and post-test) to measure the effectiveness of video-based media compared to power point media after learning Environmental Science material. The test contains 25 questions with a per-item score of 0 or 1 and a score range of 0-100. Pre-test is an activity to test students' initial competence on the material before learning using media is carried out. While the post test is an activity to test the final competence of students after learning activities using media are carried out. Pre-test and post-test items are in the form of multiple choice as many as 25 items which include Environmental Science course material developed in Video and Power point-based media including: 1) global environmental issues, 2) damage to natural resources and; 3) pollution or pollution.

## 4. Results and Discussion

### 4.1. Data Description and Discussion of Student Competencies in Video-Based Media Learning

Student competence with regard to learning outcomes as indicated by the acquisition of student scores obtained before learning (pre-test results) and after learning (post-test results) using video-based media. The results of data acquisition can be seen in the table recapitulation of the results of student competency achievement through learning with video-based media in the following table.

Table 1. *Frequency Distribution of Student Competence Results of Pre-Test and Post-Test in Video-Based Media Learning*

Competence with Video Media	Pre-Test			Post-Test		
	f	%	Average	f	%	Average
High (75-100)	12	40.00	79.00	19	63.33	85.65
Medium (65-74)	13	43.33	69.85	8	26.67	71.00
Low (0-64)	5	16.67	57.60	3	10.00	62.67
Total	30	100	71.47	30	100	78.80

High competence is stated by the criteria for obtaining an average score greater than or equal to 75, meaning that students are declared to have competence if they get a minimum score of 75. In the table it can be seen that the initial competence of students before learning using video-based media is at a moderate level, namely with a score an average of 71.47 75. This shows that most of the students as many as 13 people or 43.33% have competence at a moderate level.

The final competence of all students after learning using video-based media is at a high level with an average score of 78.80 75. The table shows that as many as 19 people or 63.33% have competence at a high level with an average score of 85.65. While at the moderate level of competence, as many as 8 people or 26.67% of students obtained an average score of 71. Low level competence only obtained 3 people or 10% with an average score of 62.67.

The achievement of student competence after learning using video-based media shows that 6 out of 10 students have a high level of competence, 2 to 3 out of 10 students have a moderate level of competence, and 1 out of 10 students have a low level of competence. Overall, the acquisition of the prices above shows that the group of students who have low level of competence, especially those with moderate level of competence, is still possible to be improved and upgraded to a high level of competence.

### 4.2. Data Description and Discussion of Student Competencies in Power Point Media Learning

The acquisition of student competence is indicated by the acquisition of the average score of students before learning (pre-test results) and after learning (post-test results) using power point media. The results of the acquisition of student competencies can be seen in the table for recapitulation of competencies through learning with power point media in the following table.

Table 2. *Frequency Distribution of Pre-Test and Post-Test of Student Competencies in Power Point Media Learning*

Competence with Power Point	Pre-Test			Post-Test		
	f	%	Average	f	%	Average
High (75-100)	13	40.62	79.38	15	46.88	79.20
Medium (65-74)	13	40.62	69.23	12	37.50	69.00
Low (0-64)	6	18.75	58.67	5	15.62	59.20
Total	32	100	71.38	32	100	72.13

In table 2 above, it can be seen that the initial competence of students before learning using power point media is at a moderate level, with an average score of 71.38 75. Table 2 shows as many as 13 people or 40.62% have competence at a moderate level.

After learning using power point media, the final competence of students is still at a moderate level with an average score of 72.13 75. The table shows that as many as 15 people or 46.88% have competence at a high level with an average score of 79.20. Meanwhile, at the moderate level of competence, as many as 12 people or 37.50% of students obtained an average score of 69. Low level competence was only obtained by 5 people or 15.62% with an average score of 59.20.

The acquisition of student competency achievement by learning using power point media shows that, 4 to 5 out of 10 students have a high level of competence, 3 to 4 out of 10 students have a moderate level of competence, and 1 to 2 out of 10 students have a low level of competence. Based on the price obtained in the table above, it shows that the group of students who have a low level of competence, especially with a medium level of competence, is still possible to be improved and upgraded to a high level of competence

#### 4.3. Data Description and Discussion of Student Competencies in Video-Based Media Learning and Power Point Media

The initial competence of students before learning to use media was carried out (pre-test results) both in groups of students with learning using video-based media and power point media showed that the average score was not different, namely 71.47 and 71.38. The effectiveness of competency achievement is shown by the final results after learning (post-test results) using video-based media and power point media. The achievement of student competencies can be seen in the table for recapitulation of student competencies through learning with video-based media and power point media below.

Table 3. *Frequency Distribution of Student Competencies Between Video-Based Media Learning and Power Point*

Power Point Competence	Learning with Video-Based Media			Learning with Power Point Media		
	f	%	Average	f	%	Average
High (75-100)	19	63.33	85.65	15	46.88	79.20
Medium (65-74)	8	26.67	71.00	12	37.50	69.00
Low (0-64)	3	10.00	62.67	5	15.62	59.20
Total	30	100	<b>78.80</b>	32	100	<b>72.13</b>

An indicator of the effectiveness or success of learning Environmental Science courses is when the average competency achievement score of all students obtains a minimum score of 75. The table above shows that, the competence of students with learning using video-based media obtained an average score of 78.80 or greater than 75. Meanwhile, the average score of student competence by learning using power point media is 72.13 or less than 75. The average score of these two groups of students shows that the group with learning using video-based media gets a score of more than 75, which means that learning using video-based media is more effective than learning using power point media in Environmental Science courses.

## 5. Conclusion

Based on the results of the study, it can be concluded that the competence of students with video-based media learning in Environmental Science courses has reached a high level with an average score of more than 75. In addition, student competencies with power point media learning in Environmental Science courses are at a sufficient or moderate level with an average score of less than 75. The results of the two average scores can be used as a reference that the effectiveness of learning using video-based media is higher than learning using power point media in Environmental Science courses. The indicator of the effectiveness of learning using video-based media is shown by the achievement of an average student competency score of more than 75.

The recommendation from the results of this study is that students' competence at low and moderate levels is still possible to be improved and upgraded to a high level in other subjects other than Environmental Science. Of course, the application of learning using video-based media must adapt to the material to be applied and follow the standards of the learning process according to the provisions. In addition, the application of digital technology-based learning can be developed in a more innovative and creative direction while still referring to producing quality learning media and achieving optimal student competencies.

## **References**

- Mulyasa. 2004. Kurikulum Berbasis Kompetensi. Bandung: Penerbit PT Remaja Rosdakarya
- Nazir, Moh. 1988. Metode Penelitian. Jakarta: Ghalia Indonesia.
- Looy, Van, Van Dierdonck, dan Paul Gemmel (1998) Service management: An Integrated Approach (Online). London: Financial Times Management.
- Gagne, R.M., & Briggs, L.J., 1979, Principle of Instructional Design, New Yorks: Holt Rinehart and Winston.
- Pakpahan, Nurmi F.D.B. 2019. Penelitian: Pengembangan Media Pembelajaran Berbasis Video Pada Mata Kuliah Ilmu Lingkungan Bagi Mahasiswa Teknik Sipil (Belum dipublikasikan).
- Priyanto Y., dkk. 2013. Pendidikan Berperspektif Lingkungan Menuju Pembangunan Berkelanjutan. Jurnal Wacana Vol. 16 No. 1: 41-51.
- Robbins, Stephen P. dan Coulter, Mary. 2010. Manajemen Edisi Kesepuluh. Jakarta: penerbit Erlangga.
- Robbins, Stephen P. dan Coulter, Mary. 2007. Manajemen. Jakarta: PT. Indek.
- Sudjana, Nana dan Rivai, Ahmad. 2013. Media Pengajaran. Bandung: Sinar Baru Algesindo Offset.
- Soerjani, M., dkk., 1987. Lingkungan, Sumber Daya Alam dan Kependudukan Dalam Pembangunan. Jakarta: UI Press.
- Undang-Undang Republik Indonesia No. 32 tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup.