

## The Effect of Web Enhanced Course (WEC) and Web Centric Course (WCC) towards Student Learning Results on Reproduction System Concept

(Accepted 29 January 2017; Revised 12 November 2017; Published 30 November 2017)

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### **Abstract**

Based on studies, many schools use e-learning web centric course (WCC) as an effort to improve student learning results. But in fact, WCC still has a lot of weaknesses. Therefore, this research was conducted for another e-learning which is based on web enhanced course (WEC) to overcome these WCC's weaknesses. This study aimed to determine the effect of e-learning WCC and WEC for student learning results in grade XI in human reproduction system concept. The research methods used quasy experimental with non-equivalent group pretest posttest design and sample used 2 experimental groups that are WEC and WCC class in one of the high schools in Bandung with 30 students for each group which obtained by purposive sampling. Instruments used are multiple choice questions as the main data, questionnaires and interview guides as secondary data. Based on the result, average posttest for WEC is 81.90 and WCC is 69.96 with the hypothesis test result  $Z_{\text{count}} = 3.89$  in the retained area for  $Z_{\text{table}} = 1.96$ . Based on these results, it can be conclude that there is learning effect of using e-learning WEC with WCC in students learning results in human reproductive system concept and using e-learning WEC can further increase student learning results when compared with WCC.

**Keywords:** E-learning, Web Enhanced Course, Web Centric Course, Learning Results, Human Reproductive System

## INTRODUCTION

The development of information technology in recent years is growing very rapidly. One area that gets a significant impact with the development of this technology is the field of education. This led to the birth of the idea of e-learning (Jethro, et al, 2012). which is expected to improve student learning results. Many schools have utilized this technology presence by using a web-centric e-learning center (WCC), where students have 2 learning sessions, face-to-face sessions in the classroom and online sessions outside school hours (access the learning web) (Noesgaard & Ørngreen, 2015). WCC-based e-learning has a number of advantages in which students can learn by accessing the web of learning anytime with updated material and various types of learning media that can make it easy to learn abstract concepts, one of which is the materials in Biology. However, WCC-based e-learning has several disadvantages, such as not being able to touch affective part like traditional teachers in the classroom, and low motivated students will find it difficult to learn independently by using the web outside of this school (Soekartawi, 2003).

Related to the literature study that has been done, the author tried to provide solutions to overcome the

weaknesses found in the implementation of WCC-based e-learning by developing a new e-learning model that makes computer technology and the internet as a learning medium that is assisted by the existence the presence of teachers as mentors when learning in the classroom. The development of this new model is called a web-based enhanced course (WEC) (Noesgaard & Ørngreen, 2015), where face-to-face sessions and online sessions are united. So it is expected that students who do not have high learning motivation can be encouraged and guided by the teacher so that the results of learning to be better. This WEC-based e-learning enables students to learn abstract concepts commonly found in Biology subjects, one of which is the concept of the human reproductive system, where it is not possible to practice in the learning process. With the WEC, students will be tech-savvy and will feel helped by the learning materials in the web such as text, images, video, animation and even quiz that students can access with the teacher as a mentor and facilitator of learning (Ardiansyah et al, 2014).

The general purpose of this study is to know the effect of WEC and WCC based e-learning on student learning results on the concept of human reproductive system.

## METHOD

The method used in this research is quasi experiment. This research method is also referred to as experiment research which is not actual, because in this research used 2 group of research which sampling is not random (Arikunto, 2006). The objective is to obtain information that is approximate for information that can be obtained with actual experiments in circumstances where it is not possible to control or manipulate all relevant variables (Margono, 2007). The quasi experiment method is used to investigate the effect of WEC and WCC based e-learning use in improving student learning results in the concept of human reproductive system. The research design used is Non Equivalent Group Pretest-Posttest Design that samples are given treatment for a certain time. In this design, two experimental groups were given preliminary tests and the final test subsequently sought gain between experimental groups 1 and 2. The gains obtained from the two groups were converted into N-gain and tested statistically. Two of these classes get the same test twice before the pretest and the posttest test. The subjects of this study were students in two classes XI in one of the SMA Negeri in Bandung regency in 2010/2011, numbered each

of 30 people selected by purposive sampling.

The instruments used in the entire series of research activities are grouped into 3 types, namely: 1) the learning test instrument to assess the quality of student learning results from the cognitive aspect, student response questionnaire, teacher interview guide, web learning (Figure 1) complete with various features such as chat feature to consult with teacher especially for WCC class (Figure 2), discussion page, student attendance list, etc.

The influence of the use of WEC and WCC based e-learning in improving high school student learning results on the concept of human reproductive system is reviewed by testing hypothesis to test whether or not the hypothesis is accepted. In this study the data is homogeneous with the normal distribution, and the number  $n > 30$ , the parametric statistic method is used, that is the Z test to test the equality of the average value of the two large samples, here is the test formula Z (1) (Margono, 2007).

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{S_1^2}{m_1} + \frac{S_2^2}{m_2}\right)}} \quad (1)$$

## RESULT AND DISCUSSION

Learning results are captured with multiple-choice objectives provided

before and after the learning takes place. Pretest aims to know the initial knowledge of students and posttest to know the final knowledge of students about the material of the human reproductive system. Recapitulation of pretest and posttest value in experiment 1 (WEC) and experiment 2 (WCC) class can be seen in Table 1

Based on the data from Table 1, it was found that the students' pretest results in the WEC class and WCC class were still quite low as below the average score of learning completeness of  $>65$ . This was allegedly due to the lack of preparation of learning undertaken by students in both classes. Furthermore, the normality and homogeneity test to determine the distribution of data in variables to be used in the study. In Table 2, the sample came from a normally distributed population because for both classes WEC and WCC, yielded  $\chi^2_{\text{count}} < \chi^2_{\text{table}}$ . Then, Table 3 shows the homogeneity test was done to find out the uniformity of the sample variance taken from the same population. Based on the F test it is known that the data is homogeneous. After hypothesis testing on the initial ability of WEC and WCC class students using Z test found that  $Z_{\text{count}} (1.85) < Z_{\text{table}} (1,96)$  can be seen Table 4, so  $H_1$  is rejected, so it can be said that there is no significant difference

between pretest value of WEC class with value pretest WCC class.

Since there is no significant difference for both pretests it is immediately continued to test the posttest results by using the Z test (for reasons, the data remains normal and homogeneous distributions and  $n > 30$ ). Based on the posttest Z test results, it can be seen that  $Z_{\text{count}} (3,89) > Z_{\text{table}} (1,96)$ , so  $H_1$  is accepted and it can be said that there is a significant difference between posttest grade experiment 1 (WEC) with experiment class 2 posttest value (WCC) so that student learning results through e-learning based learning web enhanced course is higher than student learning results through web-based e-learning learning centric course. There is a significant difference in posttest value between the two classes, especially the WEC class which is proven to increase the students' learning results can occur due to various internal and external factors. One of the internal factors that influence learning results is the interest of students who will spur the motivation of students to learn through the internet independently at school hours accompanied by the teacher so that students can be more controlled when independent learning, and help students become more active when it finds information that is not understood in on the web.

Table 1 Recapitulation of Learning Results of Experimental Classes 1 and 2

Component	Pretest		Posttest	
	WEC	WCC	WEC	WCC
N	30	30	30	30
$\bar{X}$	40,56	46,43	81,90	69,97
SD	13,53	10,15	10,97	13,47
Highest	68	64	96	92
Lowest	16	28	60	40

Table 2 Normality Test

Normality Test				
$\chi^2_{count}$	3,61	9,39	4,02	4,06
$\chi^2_{table}$	9,49	9,49	9,49	9,49
Conclusion	Normal	Normal	Normal	Normal

Table 3 Homogeneity Test

Homogeneity Test		
$F_{count}$	1,52	1,79
$F_{table}$	1,86	1,86
Conclusion	Homogen	Homogen

Table 4 Hypothesis Test

Hypothesis Test		
$Z_{count}$	1,85	3,89
$Z_{table}$	1,96	1,96
Conclusion	$H_1$ rejected	$H_1$ accepted

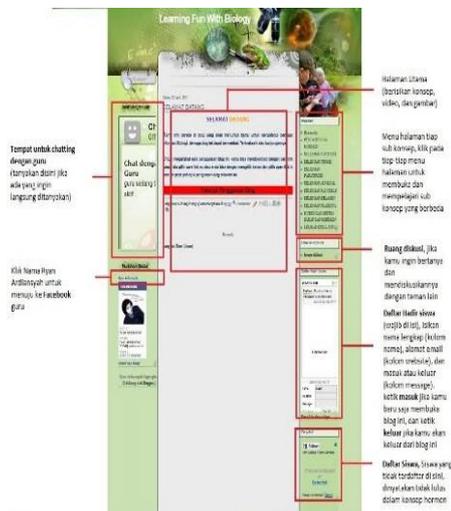


Figure 1. Web E-learning Used

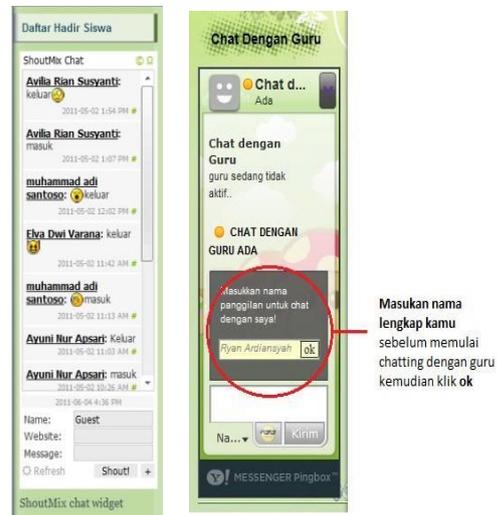


Figure 2. A Chat Feature that Students Use to Communicate with Teacher When an Online Session (WCC class only)

Unlike the students in the WCC class, based on the questionnaire of students response to this learning as much as 48.33% of students said that e-learning outside the class there are many difficulties, of course these two things will reduce student interest in learning so that affect learning results. Although in fact when students in the WCC class access the web outside of school hours, students can still communicate with teachers using the chat facility, only this facility is rarely used by students, making it difficult for teachers to control student activities on the web so students can definitely learn with using the web. Most of the other students (73.33%) stated that learning on the web outside of school hours (WCC) cost a lot, because not all students have internet access at home. This compulsion will certainly decrease the students' learning motivation so that it affects the learning results (Slameto, 2010).

Unlike WEC classes, students are more free to ask teachers directly when they discover things that are not understood on the web and students are more controlled when looking for information on the web so teachers can ensure students are not accessing the wrong information. As many as 94.67% of students in the WEC class thought that following WEC learning in the classroom is a new experience and

easier in remembering the concept. When students experience new experiences that are more challenging then learning results will tend to increase (Survani et al, 2014).

Both e-learning models are still inseparable from the shortcomings and advantages. The WCC has advantages such as students can access information and tasks anytime and anywhere (Munir, 2008), the only drawback is the interaction between teachers and students is reduced so that it can slow the formation of values in the teaching-learning process, and other deficiencies of the WCC class are likely to ignore academic aspects or social aspects, so it tends toward training rather than education. While the WEC model has its advantages is not to reduce the interaction between teachers and students, even can lead to interaction between students and other students and the role of teachers as facilitators actually appear in the WEC class. The lack of WEC is that the internet connection in the school's laboratory is a bit slow because the same URL address is accessed simultaneously by the school students so the internet network slows down a bit. Obstacles found in learning will be a cognitive load that will burden students in terms of adding information (Survani, et al 2014).

## CONCLUSION

Based on the results of research and discussion, it can be concluded that the results of student learning before the material given the human reproductive system through e-learning learning web-based enhanced course and web centric course, ie there is no significant difference between pretest value experiment class 1 (web enhanced course) with a pretest grade of experiment 2 (web centric course). Student learning results after being given human reproductive system materials through e-learning web-based enhanced course and web centric course, such as there is a significant difference between the value of posttest experimental class 1 (web enhanced course) with the value of posttest experiment class 2 (web centric course). Thus, there is a significant difference in learning results, between students learning through e-learning based on web enhanced courses with students learning through e-learning based on web centric course on the concept of human reproductive system and e-learning web-based enhanced course can further improve student learning results compared to the web centric course on the concept of the human reproductive system.

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