Implementation of Webquest in teaching Circulatory System

Monera A. Salic-Hairulla1*, Lea May L. Agad1*, Daryl Jean A. Pitonang1, Tyra Faye Terrado1 and Chokchai Yuenyong2

1 College of Education, Mindanao State University – Iligan Institute of Technology, Iligan City, Philippines
2 Faculty of Education, Khon Kaen University, Khon Kaen, Thailand
*Corresponding author’s e-mail address: leamay.agad@g.msuit.edu.ph

Abstract. This study aimed to determine the performance of the respondents in using the developed Webquest in the Google site. The study used the quasi-experimental design method making use of pretest-posttest design. The result of the study showed that there was a significant improvement in the respondents’ conceptual understanding in the concept of Circulatory System. The respondents exposed to the developed webquest had significant high test scores in the post-test as compared to the pre-test. The developed instruction was implemented to 30 Grade 6 Elementary pupils and another 30 pupils for traditional lecture method from selected public schools who were enrolled during the SY 2016 - 2017. Moreover, the result also showed that there is a significant difference between the post test scores of control group and experimental group. Result implies that the developed Webquest has a positive impact in teaching Circulatory System.

1. Introduction

The impact that technology has had on today’s schools has been quite significant [1]. This widespread adoption of technology has completely changed how teachers teach and students learn. Teachers are learning how to teach with emerging technologies (tablets, iPads, Smart Boards, digital cameras, computers), while students are using advanced technology to shape how they learn. By embracing and integrating technology in the classroom, teachers are setting their students up for a successful life outside of school. Moreover, textbooks are a great source of reliable information and ready-made activities, but the content they provide can be generic and not particularly engaging for students [2]. By leveraging the instructional potential of web-based resources, learners can increase student engagement, expose them to authentic content, and engage them in collaborative activities that trigger critical thinking and creativity. It is fact that it can offer students a "virtual teacher" because students can access the instructional materials anytime, anywhere. This allows students who were absent from the opportunity to access instructional materials away from school, and even the possibility to accommodate students in a course when their schedule is full [3].

Recent advancements in educational technologies have yielded positive results in our education sector [4]. The idea of webquest, a web-based teaching material, has become increasingly popular. A Webquest engages students in an inquiry, problem-based learning activity that integrates teamwork, higher order thinking, and access to information on the Internet [5] The use of web in learning by students is increasing as it enriches the experience in learning, making the students to be responsive of the existing development. The role of educators has become more challenging as the education sector
to date requires the teachers to have knowledge and skills in ICT. Significantly, it is pertinent because of the technological advancement in developing ideas and creativity among teachers and students [6].

This paper will examine the effects on the implementation of the developed webquest in teaching circulatory system among Grade Six pupils.

2. Statement of the Problem

This research aimed to utilize Webquest in teaching Circulatory System among Grade Six pupils in Sgt. Miguel Canoy Memorial Central School. Specifically, this study seeks to find answers to the following:

1. What is the profile of the respondents according to electronic devices
2. What is the performance of the respondents in the developed Webquest in?
   a. Pre-test
   b. Post-test
3. Is there a significant difference on the performance of the experimental between pre-test and post-test?
4. Is there a significant difference of the control group’s performance and experimental group’s performance?

3. Methods

This chapter presents in details the methods and procedures of this study. It includes subjects of the study, research design, instruments of the study, and data gathering procedure.

3.1. Subjects of the study

The respondents were 30 Grade 6 Elementary pupils for the experimental group and 30 pupils for the traditional group from selected public schools who were enrolled during the SY 2016 - 2017.

3.2. Research Design

This study used the quasi-experimental design method making use of pretest-posttest design. The developed instruction was utilized to the experimental group and the traditional lecture method was implemented to the control group. In the selection of the respondents, a purposive sampling was used in choosing the subjects of the study. Alternatively, purposive sampling method may prove to be effective when only limited number of people can serve as primary data sources due to the nature of research design, aims and objectives. Correspondingly, the researchers chose Grade VI pupils who belong to the first section both in experimental and control group.

3.3. Instruments of the Study

The researchers formulated one set of questionnaire each consisting 30 items that was pilot-tested and validated by the thesis adviser and science teachers; pre-test and post-test, with exactly the same content to be handed before and after the implementation of the class discussion. This was face validated by the Science teacher experts, panel members and thesis adviser. And learner’s perception checklists were also provided. The questionnaire was used to determine the learners’ motivation through the Webquest in learning the circulatory system. It was composed of 5 items that corresponds whether they agree or disagree to the perception on the developed Webquest as an instructional material for teaching circulatory system.

3.4. Data Gathering Procedure
The researchers submitted a letter-request to conduct a study on the said schools from the Schools Division Superintendent. After the permit was approved, the researchers secured a permit from the School Principal of Sgt. Miguel Canoy Memorial Central School and Hinaplanon Elementary School to push through with the study. The first group, the control group, will be exposed on the traditional method which is the Grade IV pupils from Hinaplanon Elementary School. The second group, the experimental group will be exposed on the use of Webquest which is the Grade VI pupils from Sgt. Miguel Canoy Memorial Elementary School. Internet connection must be considered for the experimental group. Prior to the administration of the two groups with the varied method mentioned, they answered a pre-test to ensure a justifiable correlation to the post test results, which was given after administering the two methods.

![Figure 1. Flow Chart of the Data Gathering Procedure](image)

4. Results and discussion
The researchers found the profile of the respondents who owned electronic devices to determine their accessibility to internet. With technology playing a bigger role in the classroom and children utilizing computers, tablets, and apps to learn, making sure children know how to use these different types of media is becoming more important [7]. 32% of the respondents use mobile phone followed by tablet which is 24%. On the other hand, only 6% use Ipad. This means that the biggest slice of the pie which is mobile phone is used as the means to connect on the internet and the least is Ipad. It indicates that 10 out of 30 respondents in Sgt. Miguel Canoy Memorial Central School has mobile phone. Mobile phones are a popular form of communication in today's society, and respondents of all ages own cell phones [8].
The researchers used 30-item test for the pretest and posttest. The table below shows the descriptive statistics of the performance of the respondents in using Webquest. Their pre-test scores have an average of 14.43 with minimum score of 7 and maximum of 26. The total score of the respondents is 433. The standard deviation is 3.91 which means that the scores are dispersed from the mean. For the post test, scores are way better than the pre-test scores. The average score is 21.13 and the total score is 634. The minimum score is 13 while the maximum is 27. The standard deviation of 3.58 is also good because it indicates that scores are closer to the mean. It shows that the respondents performed well during the discussion in association with the implementation of Webquest.

| Variable | Mean | Standard Deviation | Minimum | Maximum | Sum |
|----------|------|--------------------|---------|---------|-----|
| Pretest  | 14.43| 3.91               | 7       | 26      | 433 |
| Posttest | 21.13| 3.58               | 13      | 27      | 634 |

The paired t-test result shows that there is a difference between the pre-test and post test scores of the respondent’s performance. The null hypothesis of the test is that, there is no significant difference between the two test scores is rejected since there is a significant difference between the two test scores. The researcher set the level of significance to be 0.05. The statistical test used is paired t-test since the data are results of before-and-after situation. Based on the results below, the difference between the means of the test scores is -6.7 and the p-value is 0.000. Hence, the null hypothesis is rejected and the researchers conclude that there is a significant difference between the test scores.

| Variable       | Mean Difference | t-statistic | p-value |
|----------------|-----------------|-------------|---------|
| Pretest-Posttest| -6.7            | -10.841     | 0.000   |
Based on the results below, the test statistic is -8.462 and the p-value is 0.000. Hence, the null hypothesis that there is no significant difference between the post test scores of the two schools is rejected and concluded that there is a significant difference between the post test scores of the two schools. The researcher set the level of significance to be 0.05. The statistical test used is independent sample t-test since the data came from two independent samples.

**Table 3.** Two Sample T-Test For The Post-Test Of The Control And Experimental Group.

| Variable             | Mean   | t-statistic | p-value |
|----------------------|--------|-------------|---------|
| Posttest Control     | 11.07  | -8.462      | 0.000   |
| Posttest Experimental| 21.13  |             |         |

The table below shows the distributions and percentage of learners’ perception on the developed Webquest as an instructional material for teaching the circulatory system. All of the respondents agreed that they enjoyed the topics of the circulatory system by using the Webquest and the Webquest activity is interactive. This means that the introduced Webquest can be enjoyed in an interactive way. There were 93.30% of the respondents agreed that they can easily understand the topics on the circulatory system by using the Webquest and it motivates them to learn more, and 6.70% of them disagreed to the statements. This means that the introduced Webquest is simple and instructional. There were 86.70% of the respondents agreed that the Webquest develops their critical thinking skills and 13.3% of them disagreed. This means that the Webquest aims to develop the Higher Order Thinking Skills (HOTS) of the learners. There were 80% of the respondents agreed that the Webquest can be easily manipulated without the supervision of the teacher and 20% of them disagreed. This means that without the aid of the teacher the learners can learn through their own. Overall, the table says that the learners have learned and enjoyed the Webquest. From the student’s perception questionnaire, the respondents found that the Webquest was enjoyable, motivational, entertaining, interactive, easy to learn, and helped them develop their critical thinking skills.

**Table 4.** Percentile distributions of learners’ perception on the Webquest

| Learner’s Perception                                                                 | Agree | Disagree |
|--------------------------------------------------------------------------------------|-------|----------|
| 1. I can easily understand the topics on circulatory system by using the Webquest.  | 28    | 2        |
|                                                                                      | 93.3  | 6.7      |
| 2. The Webquest develops my critical thinking skills.                                | 26    | 4        |
|                                                                                      | 86.7  | 13.3     |
| 3. I have enjoyed the topics on the circulatory system by using the Webquest.        | 30    |          |
|                                                                                      | 100   |          |
| 4. The Webquest motivates me to learn more.                                          | 28    | 2        |
|                                                                                      | 93.3  | 6.7      |
| 5. The Webquest activity is interactive.                                             | 30    |          |
|                                                                                      | 100   |          |
5. Conclusion
The profile of the students showed that they were able to use the developed Webquest because of its gadget and internet ownership. There is highly significant difference between the pre-test and post test scores of the respondents based on their performance. There is a difference between the post test scores of control group and experimental group. This also concludes that the Webquest is helpful and effective in teaching Circulatory system among Grade 6 pupils. The Webquest was really enjoyable, entertaining, interactive, easy to learn and easy to use. It really helped the learners to develop their collaboration skills and creativity especially in making their outputs.

Acknowledgement
Sincere gratitude is due to the following: To our dear parents for the unconditional love and gave us words of encouragement and to Mindanao State University – Iligan Institute of Technology for providing the researchers’ an avenue for learning and growth. To the DEPED office of the division of Iligan City, the Schools Division Superintendent, School principals and the Teachers of the schools of Sgt. Miguel Canoy Memorial Elementary Central School and Hinaplanon Elementary School, for allowing us to conduct this research. This accomplishment would not have been possible without them. Finally, to the Almighty God for the guidance and protection.

References
[1] Cox, J. (2015). Benefits of technology in the classroom. K-12 Teachers Alliance. Retrieved May 21, 2017
[2] Simon, E. (2015, April 28). Teaching With Web-Based Resources. George Lucas Educational Foundation
[3] Mathew, N., & Dohery-Poirier, M. (2000, March 6). Using the world wide web to enhance classroom instruction. First Monday
[4] Ramey, K. (2013, March 14). The use of technology - in education and teaching process. Use of Technology
[5] Deutsch N. (2014). Why Use WebQuests for Today’s Learners. The WizIQ Blog
[6] Nordin N. et.al (2012). Development and Evaluation of Webquest for Science Subject. The International Journal of Learning
[7] Locklear, M. (2017, May 12). Even very young children require media literacy to learn from technology. Blog on Learning and Development.
[8] Watson, E. (2010). Advantages of cellphones for students. Leaf Group Ltd. Leaf Group Media.