Effects of resource-based learning strategy on the performance in biology of Grade 8 learners

Mota John Christopher T.1, Alia Leemarc C.2*

1Department of Secondary and Elementary Education, Undergraduate Student, Mindanao State University at Naawan, Naawan, Misamis Oriental, 9023, Philippines
2Department of Secondary and Elementary Education, Faculty of College of Education and Social Sciences, Mindanao State University at Naawan, Naawan, Misamis Oriental, 9023, Philippines
*Corresponding author’s e-mail address: leemarc.alia@msunaawan.edu.ph

Abstract. This study aims to find out the effectiveness of Resource-Based Learning Strategy on the performance in Biology. Specifically, to find out the significant difference on the pretest and posttest scores in Biology of the learners. Experimental research design, the pretest posttest control group design was used. The study was conducted at Manticao National High School, Grade 8 learners section Faith and Generous. There were thirty-five randomly selected learners taught using Resource-Based Learning and thirty-five learners exposed to Lecture Method respectively. T-test revealed showed that there was no significant difference on the learners’ pretest scores of the two groups, since the p-value is 0.1474 which is greater than 0.05. Moreover, there was a significant difference on the learners’ posttest scores in Biology when taught using Resource-Based Learning and Lecture Method as shown with the p-value of 0.0228 which is lesser than 0.05 level of significant. Paired T-test showed that there was a significant difference on the learners’ pretest and posttest scores in Biology when taught using Resource-Based Learning and Lecture Method. Resource-Based Learning strategy on enhancing learners’ performance in experimental group, as shown in the p-value of $5.18 \times 10^{-07}$ and Lecture Method has a p-value of 0.0005 and both p-value is less than 0.05 level of significance. This study concluded that Resource-Based Learning strategy can improve the learners’ performance in Biology by the use of more resources that helps them discover further definitions, concepts and ideas and making their learnings more meaningful by sharing their ideas on what they have researched to the class and would help the learners developed their communication skills and to have a lifelong learning.

1. Introduction
During recent years, the role of educational resources has undergone a metamorphosis. The changes have not only transformed media, they have distributed production of and access to digital resources while altering fundamentally how, when, and for what purposes resources are created and used. The metamorphosis has been propelled by growth of information systems such as the Internet and the and the ubiquitous presence of enabling technologies in classrooms, libraries, homes, businesses, and communities.

One successful method for developing information literacy skills through resource-based learning which involves having learners assume more responsibility for locating the very materials from which to learn. This approach develops lifelong learning skills because learners are learning from the same
Resource-based learning offers promise for broad applicability across a variety of contexts to provide access to an expanding global library of digital resources. The following are the benefits of RBL: it accommodates individual differences in learning styles, abilities, needs, interest’s and prior knowledge. Learners are able to learn at their own pace; the process encourages learners to be responsible for their own learning. It becomes memorable then since they are personally discovering; it promotes the development of problem-solving, decision-making and evaluating skills; it provides opportunities for learners to become effective users of information technology; and, learners learn how to learn. Becoming more information literate, they will develop positive attitudes and skills that are useful throughout life [2].

Resource-Based Learning (RBL) provides the training ground for the development of the necessary information literacy skills for learners to navigate the changing, sometimes confusing, landscape of information sources. Information literacy, according to the Association of College and Research Libraries (ACRL), is a set of abilities requiring individuals to recognize when information is needed and to acquire the ability to locate, evaluate, and use effectively the needed information. Information literacy forms the basis for lifelong learning[3]. It is common to all disciplines (meaning it is found in all disciplines, not that it is the same in all disciplines), to all learning environments, and to all levels of education. Information literacy is a potential tool of empowerment for all learners, reached through a “Resource-Based” learning approach. Information literacy and the resource-based learning programs that foster it – counteracts the information dependency created by traditional schooling, where learners must rely on the teacher to dispense information[4].

2. Theoretical Background

This study anchored on the theory of Piaget’s Constructivism theory, Bruner’s Constructivism theory, Vygotsky’s Social learning theory, Ausubel’s Meaningful learning theory, Dewey’s Learning-by-Doing[6]. This study is grounded on the belief that learners learn best when they construct their own knowledge and apply or generalize its meanings to new situations. The constructive paradigm as advocated by Piaget and Bruner stresses that whatever gets into the mind has to be constructed by the individual through knowledge discovery.

**Figure. 1** shows the relationship of the independent variable (Resource-Based Learning Strategy) to the dependent variable (Learners’ Performance in Biology).
2. Methods

The study used true experimental design, the randomized pretest-posttest control group design. Two sections are used, with one group being taught to Resource-Based Learning strategy and other group with Lecture Method. Random assignment was used to form the groupings. The performance of learners was measured through giving of pretest and posttest before and after implementation of the topics chosen by the researcher. The subject of the study were the grade 8 learners of Manticao National High School, SY 2017-2018. This study involved two sections the grade 8 Faith and Generous with total of 70 learners. It is located in Barangay Pagawan, Manticao, Misamis Oriental.

An instrument used was table of specification to determine the level of cognitive domain in each test questions. There were six lesson plans used during the implementation of the study. These lesson plans served as a guide during the conduct of the study. The topics and activities of the biology topics were stated in the lesson plans. Of the six lesson plans, the three lesson plans were used in the experimental group and the other three were used in the control group. A pretest was given before the implementation of the study and the posttest was conducted after the implementation of the study. Percentage, T-test and paired T-test were used for the statistical analysis of the data.

3. Results and Discussion

![Figure 2: Grade 8 students’ pretest score in biology](image-url)
Figure 2 reveals the percentage distribution on the learners’ pretest score in biology of grade 8 learners when grouped to Resourced-Based learning strategy and lecture method. For the Resource-Based learning strategy, one hundred percent (100%) learners got the score ranging from 0 to 17 which means that the learners did not meet the expectation. For the lecture method group, one hundred percent (100%) learners got the score ranging from 0 to 17 which means that the learners did not meet the expectation. One hundred percent (100%) of the respondents got a score that ranges from 17 and below which means did not meet the expectation. And none of the respondents in the Lecture Method group got a passing score. It implies that all of the learners who grouped to Resource-Based learning strategy and Lecture Method that have taken the pretest find it difficult for the reason that they have taken the pretest without any background knowledge of the topic included in the test. The pretest must give to the learners at the beginning of the topic or lesson discussion to fully determine their knowledge capacity and achievements. Hence, it was expected that the respondents got low score and it was found out that all of them got a score ranging from 17 and below which means did not meet the expectation. In other words, the respondents were equal in terms of learning capacity.

Figure 3 shows the percentage distribution of the learners’ posttest score in biology of grade 8 learners when grouped to Resource-Based learning strategy and Lecture Method. Resource-Based Learning strategy group, seventy-two point four percent (72.4%) of the respondents got a score ranges from 17 and below which means did not meet the expectation, seventeen point two percent (17.2%) of the respondents got a score ranges from 18 to 20 which means fairly satisfactory, six point nine percent (6.9%) of the respondents got a score ranges from 21 to 22 which means satisfactory and three point five percent (3.5%) of the respondents got a score ranges from 26-30 which means outstanding. For Lecture method group, eighty-six point two percent (86.2%) of the respondents got a score ranges from 17 and below which means did not meet the expectation, six point nine percent (6.9%) of the respondents got a score ranges from 18 to 20 which means fairly satisfactory and six point nine percent (6.9%) of respondents got a score 21-22 which means satisfactory. This implied that the
Resource-Based learning strategy group and the Lecture Method group has improved their performance in the posttest. Although the experimental group or the Resource-Based learning strategy group have better performance than of the Lecture Method group. And you can really see that the learners in the experimental group have improved a lot than of the controlled group and they have more positive outcomes than of the others.

**Difference on the learners’ pretest scores in Biology when grouped to Resource- Based learning strategy and Lecture Method**

Independent T-test result showing the differences on the learners’ pretest scores

| Group          | N  | Mean score | Mean Difference | T-value | P-value | Remarks          |
|----------------|----|------------|-----------------|---------|---------|------------------|
| Pretest        |    |            |                 |         |         |                  |
| Strategy       | 35 | 10.17      | 1.10            | 1.4693  | 0.1474  | Not Significant  |
| Lecture Method | 35 | 9.07       |                 |         |         |                  |

*With 0.05 level of significance*

Table 1 presents the difference on the learners’ pretest score when grouped to Resource-Based learning strategy and Lecture Method. The analysis reveals no significant difference on pretest scores of the learners when grouped to Resource-Based learning strategy and Lecture Method. It also shows the mean difference which is 1.10 and T-value which is 1.4693. T-test showed that there was no significant difference on the learners’ pretest scores in biology when grouped to Resource-Based learning strategy and Lecture Method. It revealed no significant, since the p-value was 0.1474 and it is greater than 0.05 level of significance. Therefore, the null hypothesis is not rejected. It implies that the learners’ pretest scores when grouped to Resource-Based learning strategy and Lecture Method do not differ with each other. It means that the respondents were equal in terms of their performances and background knowledge.

**Difference on the learners’ posttest scores in Biology when taught using Resource- Based learning strategy and Lecture Method**

Table 2. Independent T-test result showing the differences on the learners’ posttest scores of the two groups

| Group          | N  | Mean score | Mean Difference | T-value | P-value | Remarks  |
|----------------|----|------------|-----------------|---------|---------|----------|
| Posttest       |    |            |                 |         |         |          |
| Strategy       | 35 | 15.07      | 2.66            | 2.3406  | 0.0228  | Significant |
| Lecture Method | 35 | 12.41      |                 |         |         |          |

*With 0.05 level of significance*
Table 2 displays the difference on the learners’ posttest score when taught using Resource-Based learning strategy and Lecture Method. The analysis reveals there was a significant difference on the posttest score of the learners when taught using Resource-Based learning strategy and Lecture Method. It also shows the mean difference which is 2.66 and T-value which is 2.3406. T-test showed the significant difference on the learners’ posttest scores when taught using Resource-Based learning strategy and Lecture Method. The analysis revealed that there was a significant difference on the learners’ posttest scores when taught using Resource-Based learning strategy and Lecture Method in favor of Resource-Based learning strategy, since the p-value was 0.0228 and it is less than 0.05 level of significance. Therefore, the null hypothesis is rejected. The results revealed that there was a significant difference on the posttest scores of the learners and this means that the experimental group or the Resource-Based learning strategy have better performance than of the controlled group or the Lecture Method.

### Difference on the learners’ pretest and posttest scores in Biology when taught using Resource-Based learning strategy and Lecture Method

Table 3 shows the difference on the learners’ pretest and posttest score of the two groups.

| Variable        | N  | Mean score | Mean Difference | T-value | P-value | Remarks         |
|-----------------|----|------------|-----------------|---------|---------|-----------------|
| **Strategy**    |    |            |                 |         |         |                 |
| Pretest         | 35 | 10.17      | -4.53           | -6.4727 | 5.18E-07 | Significant     |
| Posttest        | 35 | 15.07      |                 |         |         |                 |
| **Lecture Method** |   |            |                 |         |         |                 |
| Pretest         | 35 | 9.07       | -3.3448         | -3.9288 | 0.0005  | Significant     |
| Posttest        | 35 | 12.41      |                 |         |         |                 |

*With 0.05 level of significance*

Table 3 presents the difference on the learners’ pretest and posttest score when taught using Resource-Based learning strategy and Lecture Method. The results that there is a significant difference on the pretest and posttest score of the learners when taught using Resource-Based learning strategy and Lecture Method since the p-value are 5.18X10^-07 and 0.0005 respectively. It also shows the mean difference which is -4.53 and T-value which is -6.4727 of the Resource-Based learning strategy and the mean difference which is -3.3448 and T-value which is -3.9288 of the Lecture Method. Paired t-test showed significant difference on the learners’ pretest and posttest scores when taught using Resource-Based learning strategy and Lecture method. For the Resource-Based learning strategy the analysis reveals that there is a significant difference in their pretest score and posttest score since the t-value is -6.4727 corresponds to the p-value which is 5.18X10^-07 and is lesser than p≤ 0.05 level of significance. The analysis revealed that there was a significant difference on their pretest score and posttest score in favor of posttest, since the t-value which is -3.3448 corresponds to the p-value which is 0.0005 is lesser than 0.05 level of significance. Therefore, the null hypothesis is rejected. This unveils that Resource-Based learning strategy has highly significant results in terms of learners’ performance in biology. This proves that Resource-Based learning strategy is effective in teaching biology.
References

[1] Beswick, N. 1977. Resource-based learning. London: Heinemann. Breivik, P.S. 1996. Information literacy: When computers aren’t enough. Learning and Leading with Technology, 23, p.p.65-67.

[2] Chen. Hsu. And Hung. 2000. Course Design for Resource Based Learning Social Science, Oxford, UK: The Oxford Centre for Staff Development.

[3] Joosten, V. & Ling, P. 1998. A quality framework for resource based learning. Royal Melbourne Institute of Technology University Australia. Retrieved December 13, 2010, from http://www.herdsa.org.au/wpcontent/uploads/conference/1998/PDF/LeadMgmt/ling.pdf

[4] Macklin. 2001. ICT and resource-based learning: Implications for the future. Br. J.Educ. Technol., 33(4), 393–401.

[5] Sitepu, B. P. (2010). The role of learning resources center in improving the access & quality of education. State University of Jakarta. fromhttp://bintangsitepu.wordpress.com/2010/07/02/the-role-of-learning-resources-center/ Retrieved February 4, 2011

[6] Vygotsky, L.S. 1978. Mind in Society: The development of higher psychological processes. Cambridge, MA: Harvard University Press.

[7] Yuenyong, C. (2017). Enhancing Thai Students’ Thinking Skills about Energy issues: Influence of Local Values. Chemistry: Bulgarian Journal of Science Education, 26 (3): 363 – 376