Journal of Educational Research on Children, Parents & Teachers, Volume 4, Number 2, 2023, 125-134
ISSN: 2664-3812, https://ercptjournal.org/

IMPACT OF COMMUNITY RESOURCES ON ACADEMIC PERFORMANCE OF SECONDARY SCHOOL STUDENTS IN BIOLOGY

Martha Ijok Adibe NJOKU
Martha.njoku@iaue.edu.ng
Department of Biology, Ignatius Ajuru University of Education, Port Harcourt, Nigeria

Abstract
The aim of the study was to investigate the effect of community resources on the academic performance of secondary school students in Biology in Obio/Akpor Local Government Area. The design adopted for the study was Quasi-experimental research design. Two schools Obio/Akpor Local Government Area were randomly selected for the study, which are; Community Secondary School, Rumuepirikom and Community Secondary School, Ogbogoro. In each school, SS2 A class was selected and using a coin, the two classes were assigned experimental and control groups respectively. The sample size of the study consists of 153 students. The instruments used for data collection were Biology Performance Test (BPT) developed by the researcher. Validity and reliability of the instrument were established. Cronbach alpha and Kuder-Richardson formular (K-R20) to obtain correlation coefficient values of 0.76 and 0.82 for BPT and QCR respectively. The data were analyzed using mean, standard deviation for research questions and t-test for hypothesis. The findings of the study show that the available community resources were health center, farm, garden and zoo, creek and ponds. The museum was not available. It also revealed that available community resources were not adequately utilized by Biology teachers. Finally, use of community resources has a positive impact on the academic achievement of Biology students. Further test for gender difference in achievement, showed no significant difference. It was recommended among others, that teachers should incorporate community resources into their teaching Biology in secondary schools.

Keywords: Community, Resources, Performance, Biology, Students, Academic.

Introduction
Community-based learning is a high-impact strategy that can enhance student engagement and retention as well as aid in information absorption, retention, and transfer. The term "community-based resources" refers to a broad range of educational tools and approaches that teachers utilize to link what is being taught in the classroom to the local community, including local institutions, historical and literary works, cultural traditions, and natural settings (Akpan, 2017). It is also driven by the idea that all communities have inherent educational resources and assets that teachers may employ to improve their lessons and the learning experiences of their students.

Students who study Biology gain fundamental life skills and processes that serve to position them to be contributing members of society. According to Azuka (2015), teachers must successfully teach Biology in order to meet this requirement. This is only possible if teachers are inclined to employ the proper techniques and tools when instructing and

studying about the subject. Such technique as using community resources for lesson delivery.

Resources in the classroom can be divided into two main categories: visual resources and audio materials. Visual resources are those that appeal to the sense of sight, while audio materials appeal to the sense of hearing. Audio-visual (A-V) materials are those resources that combine both of these qualities. According to Isola (2010) in Makinde and Abdulsalam, (2022), instructional resources are things or tools that the teacher uses to help students understand a subject much better. Objects that give auditory, sight, or both to the senses during instruction are referred to as instructional resources (Agina-obu, 2005 as cited in Asogwa et al., 2021).

Community resources were described as anything available in the community, outside of the school, that has educational value for instruction and falls under the stated parameters for usage in schools. These community resources are quite useful in science teaching. Museums, nature centers, interactive science centers, aquaria, gardens, and zoos are just a few examples of community resources that can improve Biology teaching and learning. Other resources include outstanding people, other human resources, social institutions and/or agencies, natural phenomena in the community, materials that can be borrowed or purchased, and places to explore that are specific to the local school (such as a nearby creek, pond, city street, or business). In order to provide a unique source of high-quality Biology teaching and learning that involves observation and material manipulation to demonstrate specific subject matter that has been learned in class through lecture-discussion and textbooks, community resources are used. Thus, a field trip within the community gives the students the chance to engage in research and inquiry activities, which is thought to improve the quality of education. Several studies relating to gender and achievement, availability and utilization of instructional resources and achievement in Biology have been carried out in several locations.

Friday et al. (2019) carried out a study to investigate the availability and utilization of Biology Instructional Materials in the secondary Schools in Jos North LGA and findings show that instructional materials are not sufficient in the schools and there are no biological gardens for practical in the schools. Also, the finding shows that Biology teachers make use of the available instructional materials in the teaching of the subject. The findings also revealed that instructional material are very important to influence and enhance effective learning of Biology. In another study, Iniobong and John (2022) carried out a study on “Availability, utilization and efficacy of community resources in the teaching and learning of science for knowledge transfer in senior secondary schools in Akwa Ibom State, Nigeria.” Findings revealed that private and public secondary schools in Akwa Ibom State lacked most community resources for science delivery, some of the community resources available were not utilized, science teachers’ rating of the efficacy of community recourses in instructional delivery was high and there was no significant difference in the use of community resources between private and public secondary

school science teachers. It was concluded that for science teachers to be effective in carrying out their instructional functions, there is need to harness and use the abundant resources of the surrounding communities in their teaching.

Mukagihana et al. (2020) carried out research titled “Biology instructional resources availability and extent of their utilization in teaching pre-service Biology teachers.” The study unveils that the education of pre-service science teachers necessitates inquiry and resource-based instruction to ensure the production of both hands-on and mind-on skilled science teachers. This becomes possible when a variety of instructional resources regularly support the teaching process.

The findings revealed that Biology instructional resources like classroom chairs, chalkboards, laboratories, microscopes, centrifuge, slide projectors, Biology textbooks were available while resources like a class whiteboard, classroom overhead projectors, electrophoresis unit, recorders, Polymerase chain reaction machines, among others, were absent. The findings also revealed low-level use of available Biology instructional resources in teaching pre-service Biology teachers. Makinde, and Abdulsalam (2022) in a study on “Perceived Influence of Teaching Resources Availability and Utilization on Senior Secondary School Student’s Performance in Biology in Ilorin Metropolis.” Findings revealed that secondary schools are not adequately furnished with required learning resources and the non-availability of learning resources hindered effective learning of Biology in secondary Schools thereby giving rise to poor academic performance. It was recommended among others that government should ensure that learning resources like textbooks, libraries, and laboratories are adequate in all categories of secondary schools. Odagboyi (2015) researched the Effect of Gender on the Achievement of Students in Biology Using the Jigsaw Method. A t-test analysis showed that there was a significant difference between the mean scores in favour of the males. This showed that the males gained more from the jigsaw method compared with the females. It was recommended that in order to get the best out of instruction, various methods, or a combination of them must be employed for a better result that will be visible in the quality of graduates produced.

Njoku and Mgbomo (2021) in a study on effect of field trips and demonstration methods on the achievement of secondary school students in Biology, found out that field trips better enhanced the achievement of students in Biology and that there is no significant difference in the achievement of male and female students taught Biology using field trips. Field trip is one of the ways to use community resources in teaching secondary school Biology.

Most students graduate from secondary school without acquiring the knowledge of scientific skills and understanding of the complexity of the physical world, which is contrary to the objectives of secondary school or post basic education (FRN, 2013). These students fail to understand some of the theories and concepts in Biology and this

has invariably affected their overall performance. What then could be responsible? Could it be that community resources which are useful in the teaching and learning of Biology are not available? Or could it be that the available ones are not adequately utilized by the teachers? The problem of this study, therefore, is to examine the use of community resources in the teaching of Biology in secondary schools in the Obio/Akpor Local Government Area of Rivers State and also fill the gap in literature on the use of community resources in the teaching of Biology.

In order to achieve the aim of this study, four research questions; i. what are the available community resources for teaching Biology in Secondary Schools in Obio/Akpor L.G.A. of Rivers State? ii. are the available community resources adequately utilized by Biology teachers in Secondary Schools in Obio/Akpor L.G.A. of Rivers State? iii. what is the impact of community resources on academic achievement of Biology students in Secondary Schools in Obio/Akpor L.G.A. of Rivers State? and iv. what is the influence of gender on the academic achievement of Biology students? were put forward and one research hypothesis postulated in null form; HO1: There is no significant difference on the academic achievement of male and female students taught Biology using community resources, to guide the study.

Methodology

The study adopted quasi-experimental design. Two schools Obio/Akpor Local Government Area were randomly selected for the study, which are Community Secondary School, Rumuepirikom and Community Secondary School, Ogbogoro. In each school SS2 A class was selected and using a coin, the two classes were assigned experimental and control group respectively. The sample size of the study consists of one hundred and fifty-three (153) students as intact classes were used. The experimental group consisted of 71 students (36 males and 35 females) while control group was 82 students.

The instruments for data collection; Biology Performance Test (BPT) and Questionnaire on Community Resources (QCR) were subjected to face and content validation. After validation, BPT contains twenty (20) multiple choice questions with options, A, B, C, D based on the selected content area in the SS2 Biology, which was; vertebrate skeleton, supporting tissues in plants, the ecosystem and biotic community. While the structured questionnaire; QCR contains ten questions The validated instruments were administered outside the study area to 20 SS2 students. The data so collected were put through analysis using Cronbach alpha and Kuder-Richardson formular (K-R20) to obtain correlation coefficient values of 0.76 and 0.82 for BPT and QCR respectively.

Based on the selected Biology topics; Vertebrate Skeleton, Supporting Tissues in Plants, The Ecosystem and Biotic Community, lesson plans were written and the class teachers were used as research assistants to teach the experimental group with community resources and control group taught without community resources. The two groups were taught these topics for four weeks, thereafter, BPT was administered. Mean and standard deviation (SD) were used in answering the research questions while t-test was used to analyze the research hypothesis.

Results

Research Question 1: What are the available resources for teaching Biology in secondary schools in Obio/Akpor L.G.A of Rivers State?

Table 1: mean and standard deviation showing the available resources for teaching Biology in secondary schools in Obio/Akpor L.G.A. of Rivers State

S/N	Items	Mean	Std. Deviation	Decision
1.	Health centre	3.42	0.69	Accepted
2.	Museums	1.80	0.75	Not Accepted
3.	Farm	3.06	1.07	Accepted
4.	Garden and Zoo	3.52	0.67	Accepted
5.	Creek and Pond	3.73	0.44	Accepted

Table 1 above reveals that health center, farm, garden and zoo are the available resources for teaching Biology in secondary schools in Obio/Akpor L.G.A of Rivers State based on the mean value above the criterion mean 2.50 revealed while museums are not available as the mean value is below the criterion mean 2.50.

Research Question 2: Are the available community resources adequately utilized by Biology teachers in secondary schools in Obio/Akpor L.G.A. of Rivers State?

Table 2: Mean and standard deviation showing the available community resources adequately utilized by Biology teachers in secondary schools in Obio/Akpor L.G.A. of Rivers State

S/N	Items	Mean	Std. Deviation	Decision
6.	Teachers are not using community resources to teach Biology in my school	3.53	0.46	Accepted
7.	We go out for field trip to learn different concepts in Biology	2.00	0.63	Not Accepted
8.	We make use of the community zoo to study different characteristics of animals	2.20	0.98	Not Accepted
9.	Biology teachers make use of bacteria growing kit for Biology practical	1.80	0.75	Not Accepted
10	Guest speakers from the community come to speak to us about using community resources to learn Biology	1.40	0.49	Not Accepted

Result on Table 2 show that teachers are not using community resources to teach Biology in my school. Students don't go out for field trip to learn different concepts in Biology. Majority of the respondents reported that they don't use community zoo to study different

characteristics of animals. They also reported that Biology teachers do not make use of bacteria growing kit for Biology practical. Lastly, it's also obvious from the result that Guest speakers from the community do not come to speak to us about using community resources to learn Biology.

Research Question 3: What impact do community resources have on the academic achievement of Biology students in Obio/Akpor L.G.A. in Rivers State?

Table 3: Mean and standard deviation on the impact of community resources on students' academic achievement

Group	N	Mean	Std.dev
Experimental	71	44.64	3.09
Control	82	29.25	2.65

Table 3 reveals that the experimental group had mean 44.64 and standard deviation 3.09 while control group had mean 29.25 with standard deviation 2.65.

Research Question 4: What is the influence of gender on the achievement of students taught Biology using community resources in Rivers State Obio/Akpor L.G.A. have on their academic performance.

Table 4: Mean and standard deviation showing influence of gender on the achievement of students

Gender	N	Mean	Std.dev
Male	36	42.36	2.85
Female	35	41.28	2.87

Table 4 shows the result of the influence of gender on the achievement of students taught Biology using community resources at Rivers State's Obio/Akpor L.G.A. result reveals that male students had mean 42.36 with standard deviation 2.85 while their female counterparts had mean 41.28 with standard deviation 2.87.

HO1: There is no significant difference on the academic achievement of male and female students taught Biology using community resources.

Table 5: t-test analysis on the academic achievement of male and female students taught Biology using community resources

Gender	N	Mean	Std.dev	df	t-cal	Sig	Decision
Male	36	42.36	2.85	69	0.45	0.52	NS
Female	35	41.28	2.87				

From Table 5, the result revealed that t-cal was 0.45 and a p-value of 0.45 was recorded at df = 67. Since the p-value of p=0.52 is greater than 0.05, it implies that there is significant difference on the academic achievement of male and female students taught

Biology using community resources. Thus, the null hypothesis that says there is no significant difference is not rejected.

DISCUSSION

Table 1 reveals that health center, farm, garden and zoos are the available resources for teaching Biology in secondary schools in Obio/Akpor L.G.A of Rivers State based on the mean value that is above the criterion mean 2.50. while museums are not available as the mean value is below the criterion mean 2.50. The findings disagree with the views of Iniobong, and John (2022); Makinde and Adusalam (2022) and Friday et al., (2019) who posited that secondary schools lacked most community resources for science delivery. This disparity may be due to difference in location or communities.

Table 2 shows that teachers were not using available community resources to teach Biology. Students do not go out for field trip to learn different concepts in Biology. Majority of the respondents reported that they do not use community zoo to study different characteristics of animals. They also reported that Biology teachers do not make use of bacteria growing kit for Biology practical. Lastly, it is also obvious from the result that guest speakers from the community do not come to speak to the students about indigenous Biology concepts. This finding agrees with Iniobong and John (2022); Mukagihana et al., (2020) who stated that science teachers do not utilize available resources but disagrees with Friday et al., (2019) who said that Biology teachers make use of available instructional resources for teaching.

Furthermore, table 3 reveals that the experimental group (those taught with community resources) had mean 44.64 and standard deviation 3.09 while control group (those taught Biology without community resources) had mean 29.25 with standard deviation 2.65. This shows that experimental group performed better, which corroborates the finding of Njoku and Mgbomo (2021) who stated that field trips enhanced the academic achievement of secondary school students in Biology.

Table 4 and 5 show the result of the influence of gender on the achievement of students taught Biology using community resources, the result revealed that t-cal was 0.45 and a p-value of 0.45 was recorded at df = 67. Since the p-value of p=0.52 is greater than 0.05, which implies that there is significant difference in the academic performance of male and female students taught Biology using community resources. The finding is line with that of Njoku and Mgbomo (2021) and Odagboyi (2015) who posited that there were no significant differences in the performance of male and female students in Biology when taught with field trip and jigsaw respectively.

Conclusion

Based on the findings of this study, the following conclusions were reached:

That most of the community resources under study were available except museum yet Biology teachers are reluctant to use these community resources to drive home Biology concepts. It is possible that these teachers are not aware that community resources could

be used to teach Biology effectively. Since findings show that use of community resources have positive impact on the academic performance of Biology students and there is no significant difference the performance of male and female students taught with community resources, then community resources should be an integral part of Biology teaching.

Recommendations

Based on the findings, the following recommendations were made:

- Conducting a thorough assessment of the community's natural resources, such as parks, wetlands, forests, and local ecosystems and identify potential guest speakers, experts, and organizations in the community that can contribute to Biology education.
- There should be an encouragement and promotion of field trips and outdoor education. Schools should organize regular field trips to local natural areas to provide hands-on experiences for students via collaboration with local parks, nature reserves, and environmental organizations to facilitate educational field trips and workshops.
- Community members should be encouraged to participate in Biology education by inviting experts, scientists, or environmentalists to give guest lectures or lead discussions.
- There should be an Establishment of partnerships with local organizations to provide resources, guidance, and opportunities for students.
- Educational administrators should encourage the development of community-focused Biology projects that allow students to address real-world issues. These projects can include environmental conservation, habitat restoration, or local species studies and the support of students in conducting research and taking action to address Biology-related challenges in the community.
- The fostering of interdisciplinary connections by collaborating with other subject teachers, especially those teaching environmental science, geography, and social studies, to explore cross-curricular themes related to Biology.

References

Akpan, A. (2017). Effect of manipulating science materials and equipment on science process skills by Nigerian students, Jos. *Journal of Education 2*(1), 103-109.

Asogwa, V. C., Isiwu, E. C., & Ugwuoke, C. U. (2021). Effect of instructional materials on students' academic achievement in fishery in senior secondary schools. *Global Journal of Educational Research, 20*, 153-163.

Azuka, B. F. (2015). Activity based learning in the mathematics classroom. *Journal of Education and practice, 4*(13), 68 – 75.

Federal Republic of Nigeria (2013). National policy on education (6th edition). NERDC

Press.

Friday, J., Abdullahi, N. S., Samson, K.**,** Nkwoka, J. U., & Sarki M. (2019). A Study on the availability and utilization of Biology instructional materials in secondary schools in Jos North Local Government Area, Plateau State. *Journal of Contemporary Education Research, 17*(6), 1-17.

Iniobong, F. A., & John, O. B. (2022). The availability, utilization and efficacy of community resources in the teaching and learning of science for knowledge transfer in senior secondary schools in Akwa Ibom State, Nigeria. *KIU Journal of Social Sciences, 8*(2), 257-265.

Makinde, S. O., & Abdulsalam, A. B. (2022). Perceived influence of learning resources availability and utilization on senior secondary school student's performance in Biology in Ilorin metropolis. *Nigerian Online Journal of Educational Sciences and Technology (NOJEST),* 4(2), 71-79.

Mukagihana, J., Nsanganwimana, F., & Aurah, C. M. (2020). Biology instructional resources availability and extent of their utilization in teaching pre-service Biology teachers. *African Journal of Educational Studies in Mathematics and Sciences. 16*(2), 33-52.

Njoku, M. I. A., & Mgbomo, T. (2021). Effect of field trip and demonstration methods on the achievement of secondary school students in Biology. *Rivers State University Journal of Education (RSUJOE), 24*(2), 55-64.

Odagboyi, I. A. (2015). Effect of Gender on Academic Competence of Primary Education Department Students of College of Education Akwanga Nasarawa State Nigeria. *Advances in Social Sciences Research Journal, 2*(10), https://doi.org/10.14738/assrj.210.1532