(RESEARCH ARTICLE)

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Effect of problem-solving teaching methods on students' interest and academic performance in animal husbandry in secondary schools for sustainable development in Nigeria

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Abstract

This study investigated the effects of Problem-solving teaching method on Animal Husbandry Students' interest and academic performance in Senior secondary schools in Benin City, Edo State, Nigeria. The Theory of experiential learning was used to explain how learning by active participation in the learning process can increase interest in the learning process. Quasi-experimental. Specially, the pre-test post-test control group were used to collect data from 251 students using an intact class. The results showed that students interest increase as the result of the treatment. The study found that students. performance also increases as a result of their interest in studying Animal Husbandry. The study concludes that teaching using problem solving can increase students interest in studying Animal Husbandry and also improve their performance in the subject for sustainable development in Nigeria. Recommendations include that animal Husbandry teachers should constantly use problem solving teaching methods in teaching animal Husbandry to encourage students to learn animal Husbandry effectively in secondary schools.

Keywords: Animal Husbandry; Problem-solving; Interest; Academic Performance

1. Introduction

Animal Husbandry refers to the care, management, and utilization of animals for food, fiber, and other product, while ensuring their welfare, health, and productivity. It encompasses the application of scientific principles and technologies to optimize animal production, improve efficiency and minimize environmental impact. (1). Is the art, science, and practice of breeding, raising, and caring for domesticated animals including livestock, poultry, and companion animals. (2). It also the management and care of animals, including their breeding nutrition, health, and welfare, to produce food, fiber, and other products. (3). (4) stated that Animal Husbandry is the process of domesticating animals for economic or recreational purposes and it entails   proper feeding, health care, housing and many other activities given to the animals.

Animal husbandry is the science and art of rearing farm animals for food, social and economic value. Animal husbandry as a Senior Secondary School (SSS) entrepreneurship subject was introduced by Nigerian Educational Research and Development Council (NERDC) in 2007 with the aimed at ensuring that graduates from secondary schools have relevant functional trades and entrepreneurship skills needed for poverty eradication, job creation and wealth generation ,self-sustainability, food security as well as occupation and professions (5)Maximized livestock production can only be achieved if the teaching and learning in schools are geared towards mastery of the technical skills involved in livestock production. This technical skill is best taught through problem solving methods since it involves student's active participation in the learning process (6) Teaching students using the lecture method can make students to become bored during the instructional process, as a result, students may dislike the subject (7). (8) defined interest as a

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subjective feeling of concentration or curiosity over something. She pointed out that interest can be expressed through simple statements by individual of their likes and dislikes and one is likely to do well in a discipline of interest.

Interest has a significant impact on students' academic performance of learners (9). Kate Found that when students saw value and relevance in what they were learning and how it could help achieve their goals, they were more likely to have increased interest, put forth effort, and graduate– going on to post-secondary opportunities in addition, the more competent they felt about their abilities, the more likely they were to commit to continued study and education. Student's interest is a major determinant of their academic performance.

Academic performance refers to the measure of a student's success in meeting educational goals and standards. Academic performance has been regarded as the extent to which both students and the teachers, together with the school, have attained learning outcomes that are usually determined by national examinations or regular assessment tests, using varying grading structure students' academic performance improve when active learning methods are used. (10). Increased problem- solving ability and transfer to new situations (11). problem -solving improved student's attitude towards learning and motivation (12). (13) found that school environment significantly influences students' academic performance. They confirmed that students from well-established schools with adequate infrastructure, excellent relationships between teachers and students, as well as, favourable learning environment, perform well. (14) in their findings reveals that there is significant difference between the performance of urban students and rural students. This study is set to ascertain the effectiveness of problem solving teaching methods on student's interest and academic performance in animal husbandry in Senior Secondary Schools in Edo State.

1.1. The Purpose of the Study

This study was to carried out to compare the effectiveness of problem solving method on student's interest and academic performance in Animal husbandry in senior Secondary schools Edo State Nigeria.

- Determine the effect of problem solving method on student's interest in studying Animal Husbandry in senior Secondary schools in Edo State.
- Determine the post-test mean score of students' academic performance taught animal Husbandry with problem solving and lecture teaching method in Edo State.
- Determine the post-test mean score of student's interest and academic performance taught animal Husbandry with problem solving and lecture teaching method in Edo State.

1.2. Research Question

- What is the effect of problem solving method on student's interest in studying Animal Husbandry in senior Secondary schools in Edo State?
- What is the mean academic performance score of students taught Animal Husbandry performance using problem solving and those taught with lecture methods in senior secondary schools in Edo state?
- What is the post-test mean score of student's interest and academic performance taught animal Husbandry with problem solving and lecture methods in Edo state?

2. Material and Method

This study was conducted in the south-south of Edo state. The study investigated the effects of problem-solving and lecture teaching methods on students' Academic Performance in Animal Husbandry in Senior Secondary schools in Edo State Nigeria. The research design used in this study was quasi-experimental. The population comprised 24498 and a sample size of 251 SSII Animal Husbandry students. Two major instruments were used for data collection and two materials from where the content to be taught was generated in this study. The two research instrument used for this study were, (a) teacher made test which titled: Animal husbandry Performance Test (AHPT). AHPT test which was adapted from WACE past questions by the researcher to measure students' performance before and after teaching as pre-test (Pre-AHPT) and post -test (post-AHPT) respectively and a questionnaire titled Animal Husbandry Interest questionnaire (AHIQ)

The Animal husbandry and interest questionnaire consisted of two sections: A and B, section A gathered information about the student's demographic characteristics especially students age, sex, and class. Section B consisted of twenty (20) items on student's attitude towards animal husbandry and twenty (20) items on student's interests on animal husbandry framed on four likert scale of strongly Agree(SA), Agree(A), Disagreed(D) and Strongly disagree (SD). The scoring of the responses follows this order SA=4, A=3, D=2, SD=1,

The research instrument was analysed using mean and standard deviation while Analysis of Co-variance (ANCOVA), t-test and Regression were used to test the hypotheses at 0.05 level significance. The use of ANCOVA was to control the errors of initial non- equivalence arising from the use of intact classes as subjects of the study. If the Mean gain difference is positive, it has a favourable effect and if it is negative it has an adverse effect.

3. Results and Discussions

3.1. Research Question 1

What is the effect of problem solving method on student's interest in studying Animal Husbandry in senior Secondary schools in Edo State?

Table 1 Mean rating of extent of which problem solving affect students interest in studying Animal HusbandryN124

Statement of Items	Pre-test		Post-test		MD	Decision
	Mean	SD	Mean	SD		
I am excited when it is time for Animal Husbandry	2.10	0. 986	2.96	1.02	0.86	Positive
I like Animal Husbandry because my teacher uses problem solving method	2.61	1.01	2.89	0.95	0.28	Positive
I solve most of my class work myself	2.16	1.06	2.98	1.03	0.82	Positive
I feel dissatisfied when I get low grades in animal husbandry	2.12	1.01	2.98	0.96	0.85	Positive
I like animal husbandry because my teacher always encourage me to learn on my own	2.65	1.09	3.06	0.99	0.41	Positive
I like animal husbandry because it deals with practical skills	2.52	1.13	3.05	1.04	0.53	Positive
I have confidence that I will do well in animal husbandry when husbandry when taught with problem solving.	2.37	1.14	3.03	1.03	0.66	Positive
I try to serve problem giving to me by my group	2.77	1.07	2.94	1.01	0.17	Positive
I participate actively in my group	2.34	1.13	3.18	. 92	0.84	Positive
My teacher give clear direction	2.57	1.198	2.79	1.14	0.22	Positive
The teacher make learning interesting	2.24	1.19	3.02	1.13	0.78	Positive
The teacher provides feedback on student's work	2. 15	1.05	3.05	1.12	0.9	Positive
The teacher shown concern for student learning	2.85	1.00	3.17	1.05	0.32	Positive
I was compact able contributing to the class	2.14	1.02	2.90	1.02	0.76	Positive
I work harder when working in group	2.57	1.06	3.10	. 998	0.53	Positive
My grades are better when I work in group	2.61	1.095	2.97	1.08	0. 36	Positive
I find it easier to ask questions when working in group	2.12	0. 97	2.82	1.08	0.7	Positive
It help me show my teacher what I can do	2.01	0. 97	2.89	1.16	0.88	Positive
I will recommend problem solving teaching techniques to other students	2.53	1.21	2.91	1.16	0.38	Positive
I like animal husbandry because there is prospect in it	2.64	1.18	3.05	1.04	0.41	Positive

The table 1: Above revealed that the commutative mean of item which is 2.89 is greater than the criterion means of 2.5 This implies that all the items are problem solving related factors that have effects on student's interest in learning Animal Husbandry in the study area. The finding revealed further that most students participate actively in group (3.18) also that the teacher make learning interesting in problem Solving class (3.17) and like Animal Husbandry because their teacher always encourage them to learn on their own (3.06)

3.2. Research Question 2

What is the mean academic performance score of students taught Animal Husbandry using problem solving and those taught with lecture methods in senior secondary schools in Edo state?

Table 2 Mean Academic Performance score of Animal Husbandry Students in the Experimental and Control Groups

Group	N	(PRE-TEST) Mean	SD	POST-TEST Mean	SD	MD
Experimental (PSM)	124	13.69	8.13	76.99	11.20	63.3
Control(LTM)	127	16.28	7.53	64.23	12.25	47.95

Key: SD=Standard deviation, MD= Mean difference, PSM=Problem Solving, LTM=Lecture teaching Method, N: number of respondent. The academic performance mean score of students

The results in Table 2 revealed a pre-test mean (x)score of 13.69 and 16.28 and the standard deviations of 8.13 and 7.53 and post-test mean score of 76.99 and 64.23 and the standard deviation 11.20 and 12.25 and a mean difference of 63.3 and 47.95 for the experimental and control group respectively. This means that there was no difference in the pre-test academic performance means scores of Animal Husbandry students in experimental and control groups before exposure to treatment using problem solving method. Students who took part in the study were given pre-test. The examination was marked and graded out of one hundred percent. The pre-test score was used as a covariate in the subsequent analysis. Because the students had not been taught the topic prior to the pre-test, their performance on the pre-test was dismal. This is due to the fact that the students were not entirely prepared for the pre-test. The students' dismal performance was unsurprising because they had not been taught the topic or introduced to sections of the entire topic by their teachers, resulting in very little effort on their side to study the topic independently. As a result, the low student outcomes in the pre-test were expected. The Table also revealed that the post- test mean score for students taught Animal Husbandry using problem was higher than the mean score of those not exposed to the technique. This implies that the mean score of students in the experimental groups was significantly higher as a result of the treatment they were exposed to.

3.3. Research Question 3

What is the post-test mean score of students' interest and academic performance taught animal Husbandry with problem solving and lecture teaching methods in Edo state?

Table 3 Post test results for students who received instruction through problem solving and Lecture teaching method.

Group	N	Performance M	SD	Interest M	SD
Experimental	124	76.99	11.201	2.9870	0. 10
Control	127	64.23	12.252	2.9570	0.13
Mean Difference		12.76		0.03	

The results in figure displays post test results for students' interest, attitude and Performance who received Animal Husbandry instruction through problem solving and Lecture teaching method.

As shown in Table3 descriptive statistics were used to analyse the performance, Interest, and attitude of students who were taught using problem solving and Lecture teaching method. The results show that the mean score of students who were taught Animal Husbandry using problem solving method scored 76.99 and standard deviation of 11.201 on the Animal Husbandry Performance Test. Similarly, the post-test students score for Lecture Teaching Method were located

in the 64.23 mean score range and a standard deviation of 12.252. In general students' performance increased as a result of problem solving intervention.

In comparison to their pre-test scores students' performance in post-test scores under the problem solving teaching technique was quite good. Many students scored between 51 and 60 marks category, accounting for 30% of all students who were taught through problem solving teaching method. This excellent performance was followed by 24.3 percent of students who scored between 61-70 marks category. This result confirms that problem solving teaching method instruction enhances students' Performance. The results can be classified as satisfactory. In the pre-test, students had a mean of 6.31 and a standard findings showed a mean and standard deviation of 76.99 and 11.20 respectively. When compared to the pre-test mean, the post-test results show that the problem solving teaching method has a higher mean score (76.99) to pre-test mean score (67.23). As a result of the treatment procedure, the mean difference is 3.3 Problem solving teaching method had a major impact on learner problem solving in Animal Husbandry performance, according to the findings. To establish the associations among frequencies of students' scores in problem solving teaching method, similarly students interest increase as a result of the treatment with a mean of (2.9870)

4. Discussion of Findings

4.1. Extent of which problem solving affect students interest of students in studying Animal Husbandry

The findings revealed that Problem Solving Teaching Method has more effect on student's interest in learning Animal Husbandry in Senior secondary schools in Edo State. From the experiment carried students became interested in Animal Husbandry when they have to work in team/ group, it was found that most students are excited when it is time for Animal Husbandry class. The report also showed that students like Animal Husbandry because their teachers used problem-solving method, as they solve their problems themselves. Moreover, the students agreed that they are always encouraged by their teachers. It was found out from the study that the students always solved their assignment themselves because they do not find it difficult to ask their teachers for more explanation on lessons taught. This agreed with the (15) that for teaching and learning to be done in a classroom setting, it is important to ensure that the two-way communication channel exists between the teacher and the students. Students are expected to develop cognitive and practical skills that will enable them to apply their knowledge to explain phenomena that happen around them and to solve the problem. However, there is no significant difference between the effect of problem solving and lecture method on students' interest in studying animal Husbandry in senior Secondary schools in Edo State. This implies that students were interested in Animal Husbandry after the treatment. This finding is also in line with (16) which found that when students see value and relevance in what they are learning and how it could help them achieve their goals, they were more likely to have increased interest.

4.2. Academic Performance score of Animal Husbandry Students in the Experimental and Control Groups

The findings from the analysis of research question also showed that the Animal Husbandry students' academic performance mean scores in experimental and control was not different significantly. The result revealed that X =16.28 and X = 13.69 experimental group and control group respectively. Their standard deviations are 7.529 and 8. 129 which indicated that the mean difference is insignificant. This implies no significance difference in mean performance score pre-test and is supported the findings of (17) who in their study found out that experimental and control group were equal in problem solving before the intervention strategies. This result showed that there was no significant difference between the mean academic performance scores of Animal students in the experimental and control group. This Findings is in line those of (18) which established that the Problem based learning method was more powerful in enhancing Students achievement in Agricultural science subject.

4.3. Results for students who received instruction through problem solving and Lecture teaching method.

As a result of the treatment procedure, the mean difference is 3.3 Problem solving teaching method had a major impact on learner problem solving in Animal Husbandry performance, according to the findings. To establish the associations among frequencies of students' scores in problem solving teaching method, similarly students interest increase as a result of the treatment with a mean of (2.9870) This finding is in line with the finding(19) which indicated that learners who were exposed to Problem based learning teaching Method achieve better results compared to students who were taught using conventional Lecture Teaching Method. In the same view (20) revealed that Problem Solving strategy can be used to enhance effective teaching and learning of any subject even at higher level of education, which indicate that students taught with Problem Solving teaching method performed better than those taught with conventional Lecture teaching method.

5. Conclusion

Based on the objectives of this study, the study concludes that teaching through Problem solving is more effective in producing improved academic results when compared to the lecture teaching method for Senior secondary students taking Animal Husbandry subject. Therefore, the use of problem solving in Edo State has resulted into higher interest in Animal Husbandry subject by the students.

Recommendation

On the basis of the findings, discussion and conclusion, it was recommended that;

- The curriculum used for teaching schools should be reviewed to include innovative students -cantered teaching and learning methods and technique such as problem solving teaching method for effective teaching and learning in secondary schools. The ministry of education, curriculum planners and the Nigeria Education Research and Development Council (NERDC) should note this in subsequent review of the curriculum of instruction in secondary school level. standards

Compliance with ethical standard

Acknowledgments

Disclosure of conflict of interest

The Author declares that he has no conflicts of interest for this article.

Statement of ethical approval

Statement of informed Consent to collate the opinion of Senior secondary students from Edo State government-owned schools was given by the school principals and each respondent before the instrument was administered.

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