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EFFECTS OF PRACTICAL AND PROJECT-BASED LEARNING APPROACHES ON STUDENTS' SOCIAL SCIENCE PROCESS SKILLS ACQUISITION IN CHRISTIAN RELIGIOUS STUDIES (CRS) IN AWKA EDUCATION ZONE

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ABSTRACT

The main purpose of the study is to examine the effects of practical and project-based learning approaches on students' social science process skills acquisition in CRS in Awka Education Zone. Two research questions and hypotheses guided the study. The study adopted a quasi-experimental research design of pre-test and post-test. The study was carried out in Awka Education Zone of Anambra State. The population of this study comprised of all the 1098 (senior secondary year two CRS students (546 males and 552 females) that are offering CRS in Awka Education Zone of Anambra State. The sample for the study was one hundred and five (105) CRS students (57 males and 48 females). The sample of the study was obtained using multi-stage sampling procedure in five stages. The instruments that were used for data collection for this study was Social Science Process Skills Acquisition Test (SPSAT). The instruments were validated by three experts. The reliability coefficient of the SPSAT was established using Kuder Richardson Formula 20 and internal consistency of 0.94 was obtained. Mean and Standard Deviation were used to answer the research questions. Analysis of Covariance (ANCOVA) was used to test the hypothesis at 0.05 level of significance ($p<0.05$). It was used in order to eliminate the error of non-equivalence. The findings of the study indicated that students in the practical based learning group taught CRS have higher science process skill acquisition score than those taught the same CRS concept using project-based learning. Based on the findings of the study, it recommended among others that all stake holders should prioritize practical-based learning (PBL) for CRS instruction and other science instructions in science subjects.

Keywords*:* Christian Religious Studies, Practical and Project-Based Approach, Learning, Gender and Social Science Process Skills

Introduction

The high level of moral decadence and insurgencies in Nigerian nation is an indication that there is poor religious teaching in secondary school system. Christian religious studies (CRS) as one of the religious subjects taught in secondary school in Nigerian takes a central position in ensuring moral and spiritual well-being of individuals in the society. The key roles of CRS in equipping the individuals and ensuring high level of morality is made clear

in the objectives of CRS at the senior secondary level which include; to provide more opportunities for Nigerian youths to learn more about god and thereby develop their faith in god; to enable the youths to accept Christ as their savior; to help the youths develop Christian attitude and moral values (such as humility, respect, love, and justice, etc); to instill in the youth the spirit of tolerance , reconciliation, peaceful co-existence and non-violence as well as to develop and foster in the youth the spirit of respect for all people and human life (Universal Basic Education Curriculum (UBA), 2013).

Without effective religious studies Nigerian nation will likely to end up in conflict, religious crisis, insurgencies and social unrest among other things. This is because religious control human actions in both social, political, economic and otherwise (Eluu, 2019). The teaching of CRS dates back to the 19th century with the pioneers of Nigerian education (Banjo, 2013). During the missionary administration because of the moral values, it teaches the people.

Following the government takeover of schools, Nigerian, secondary school curriculum was reviewed and more emphasis was placed on the studies of science and technological subjects. This shift affected the study and interest of students in CRS in school system leading to poor enrollment in CRS. Gbenda (2014) stresses that student's enrollment and interest in CRS could as well be as of result of inadequate provision of teaching aids, fewer professional teachers and lack of incentives among other things. Njoku (2019) equally adduced that poor enrollment of student in CRS could be attributed to teacher's instructional delivery system and teachers' personality. CRS is taught in all the senior secondary schools in Nigerian as an elective subject. The elective nature of the subject in senior secondary schools in Nigeria equally reduced the number of students that register for the subject in West African examination council (WAEC) and national examination council (NECO) as well as other internal examination. CRS is a subject that bases its teaching on the life and teaching of Jesus Christ (Ugwu, 2011) as a teaching subject, it is not only geared towards converting people to Christianity, but is necessary for value formation, orientation and reorientation of value system as well as spiritual upliftment of the student. Ali and Akubue in Njoku (2019) observed that, CRS is a subject which aims at developing and fostering in the lives of the students' Christian attitudes and values such as respect to life, obedience to constitutional authority, responsible self, selfless series to God and humanity. To them, CRS is seen as an academic discipline that is designed to provide the leaner with moral and spiritual transformation.

This shows that CRS is the study of Christian lifestyles such as love, caring, patience, faith, forgiveness and hope in God as well as good relationship among men. Obanya in Njoku (2014) maintained that CRS like every other subject has five features. These features are; a set of rational theoretical formulation, inherent capacity for growth, applicable solution to human problems, organized Body of the knowledge and a degree of uniformity with other area of academic activities. In the context of this study, CRS is defined as a

social science subject that teaches students good moral behaviour, fearing of God, knowledge and skills that will make them to contribute their quota in socio-economic and moral development in senior secondary schools. The inclusion of sound religions and moral values in the life of students invariably could help in the development of spiritual and moral sound being of the students. These important values attached to the study of CRS in schools cannot be achieved if teachers do not utilize effective teaching method that appeals to all the senses of students in leaning situations.

Organizing for effective teaching of Christian Religious studies is centered on certain factors such as "what to teach", "when to teach" and "how to teach". The teacher does not only teach the most relevant, meaningful and useful materials for specific students, he must also recognized and adopted a good and well-researched method of teaching that guarantees better understanding and also stimulates and motivate students' achievement (Abdukamid, 2010).

Christian Religious Studies is one of the subjects taught in secondary schools in Nigeria.
The teaching of the Christian Religious Studies (CRS) could be dated back as 19th century with the pioneers of Nigerian Education (Banjo, 2003). In attempting to discuss the concept of Christian Religious Studies beneficially, it is imperative, to begin by clarifying various terms with rigour and exactitude to avoid any possible news conceptions in the mind of any reader.
The word 'Christian' etymologically comes from these Greek words 'Christian' and Christos;
meaning "follower of Christ" and anointed one", it is used three times in the New Testament of the Bible (Act11:28, 1 Peter 4:16). The Bible tells us "it was in Antioch of Syria that the followers of Jesus were first called "Christian". The question that borders the mind of the reader, which the researchers consider in this definition process, is 'who is a Christian? The answer to this question can be formulated only in a cumulative fashion. Thus, a Christian is a social human person in whom God is present in grace but who is at, same time, prone to act against the, divine preference. Isreal (2011) states that a Christian is one who professes and belief in Jesus Christ or fellows the religion based on the life and teachings of Jesus Christ. Anole added that a Christian is a person who adheres to Christianity and Abraham, monotheistic religion based on the life and teaching of Jesus of Nazareth, who Christian belief is the Messiah. Okoro (2010) opines that a Christian is a particular kind of human being, not in the sense that a Christian has a different biological or psychic structure, but in the sense that a Christian has moved to a different level of human consciousness. Anih (2010) equally

state that a Christian is a follower of Jesus Christ,
that a person who believes and practices the tenets of the Christian faith in the Holy Scripture
(Bible).

However, in the context of this study, a Christian is referred to as students who practice
Christianity and learn it in school as one of a religion in the world. Religion in the other way has
been heated with lots of debate about the meaning and its practices in human society. Its
etymology can help to define the concept. Religion is derived the Latin noun 'religio', but with some ambiguities arising from these different verbs that are allied with the noun – 'religion' (to
turn constantly" or to observe conscientiously") 'religari (to bind on self) (back) and 'religere'
("to choose again") (Okoro, 2010). Each of these verbs according to Okoro points to three
possible religious attitudes. Though it is not clear from which verb the noun is derived, each of
the verbs is consistent with the view that religion "a relation to God." McBrien in Okoro (2010)
says that religion thus has to do with the whole human existence, and not merely with some
special sector of it. He further stresses that religion is the whole complex of attitudes, convictions, emotions, gestures, rituals, beliefs and institutions by which we come to terms with
and express our most fundamental relationship with reality (God and the created order,
perceived as coming from gods creative hand). Religion therefore, presupposes and flows from
faith. It is an individual social and institutional manifestation of some implicit faith in God.
Religion not only has to do with the impact of the holy upon us, but with human responses to the
holy as well. From this thought there is no doubt on the saying that a religion without the element of the Divine is like a house without foundation. Religion in line with etymology viewpoint is the medium through which man unites himself with God in worship, adoration and
service. Anih (2010) maintained that religion refers to both personal practices related to communication stemming from shared conviction. It is often described as a communal system
for the coherence of belief focusing on a system that is considered to reverence for a supernatural power or powers regarded as creator or governor of the universe. Religion therefore, has to do with the whole of human existence, and not merely with some special sector
of it. In the context of this study, religion is conceived as the belief in the teaching of Jesus
Christ such as love, provision, protection, leadership and the nature of Heavenly Kingdom
among other things which help people to live peacefully and harmoniously in the society. Christian religious studies is an aspect of learning that deals with the inculcating in the

students certain elements of education intellectual theory and practices of Christ as contained in the Holy Bible.

Eluu (2011:284) defines Christian Religious Studies as the education for the development of spiritual, moral and mental, growth of pupils or students" in essence, Christian religious studies is expected to give children an understanding of the universe and the interpersonal relationship between human beings and the supreme beings. Ugwu (2001) opines that CRS is a type of religious studies that bases its teachings in the life and teaching of Jesus Christ, Ali and Akubue in John (2009) observe that Christian religious studies is a subject which aims at developing and fostering in the lives of the students' Christian attitudes and values such as respect for life, obedient to constituted authority, responsible self, selfless services to God and humanity. They further said that CRS is an academic discipline that is designed to provide the learner with moral and spiritual transformation. In the context of this study, the researcher viewed CRS as a social science subject that teaches students good moral behaviour, fearing of God, knowledge and skills that will make them to contribute their quota in socio-economic, political and moral development in senior secondary schools in Nigeria.

The introduction of CRS in school curriculum is not a new thing. During the missionary administration of schools, CRS was given a priority in the school curriculum because of its moral values. Following the Government take-over of schools, Nigerian secondary school curriculum was reviewed and more emphasis was placed on the studies of science and technological subjects who invariably affected the growth of the discipline (Njoku, 2009) in Nigeria, many secondary schools equate Bible studies or "religious education" lessons with moral education. The nation curriculum of religious studies in secondary schools approved by the Nigerian educational research and development council (NERDC) through universal basic education programmes (UBE) (2013) and the federal ministry of education recognized the need for God and to be sound citizen who will be responsive and responsible to national calling. The curriculum covers the introduction of Christian Religious Studies; man and his relation to God, historical activities of prophets, teaching of Christ and apostles, significance of Birth of Jesus Christ, death and resurrection of Christ, Holy Spirit, Acts of Apostles, Jews and Gentiles. Miracles of Jesus Christ, commandment of God, Repentance, faith, love, believe and among others (NERDC, 2013).

Aims/Objectives of Christian Religious Studies

In the past, several aims were proposed for Christian religious studies in Nigerian secondary schools. Such of these aims is briefly discussed below according Gotan (2005);

To Teach the Bible: CRS as an academic field of study aimed at teaching the student the Bible contents. Rani in Ugbo (2003) opines that the Bible is the master textbook and in fact, in most times, the title given to the subject was Bible.

To Teach Morals: The teaching of morals has been a long-standing aim recommended for teachers of Christian religious studies in secondary schools and other institutions of learning (Nwachukwu, 2010). Morality is very important concept especially in this era of moral decadence all over the world. Moral education as over the years impacted largely through literature in the forms of legend about the gods and heroes of Greece (Gotan, 2005). Gottan admitted that in the Judeo-Christian tradition the link between morality and religions has been so close that people still
regard them as inseparable. Gotan (2005) maintains that to admit logical distinction between
religion and morality does not, however, mean that they are antagonistic realms of human
experience or that their objectives are mutually exclusive

The view that CRS aims at teaching catechesis or Christian nature underlies the frequent
demand by the various churches that Christian religious studies in schools should be given to
their adherents by teachers who are members of their own religious denomination. The view
seeks to awaken, nourish and develop one's personal belief and to hand on the received tradition
so as to build up the ecclesial community, (Mangan, 2006). Although, most religious educators
today, however, insist that confessional teaching of religion is not appropriate in the school content, its parochial nature offers scope for dealing with the practical problems of religious
diversity in modern pluralistic societies. This therefor requires a teaching method that will enhance students' learning. The methods that come to mind at this time are the practical and project-based learning approaches.

Project-based learning is a teaching strategy that focuses, directs and motivates the students to tackle real world problems on their own with little or no guide in order to achieve their set goals with promotion of collaboration and teamwork among students. According to Ulya (2022), the project approach is a concentrated, problem-based learning experience that fosters achievement and productive collaboration, where students gain greater significance than the teacher's imparted knowledge with the teacher serving as the motivational force and the students eagerly completing most of the work. This is because it is a part of real life and is completed in its natural environment, the

project approach allows work to be completed in a friendly manner.

Outi and Maija (2021) noted that Project-based learning include elements that encourage collaboration between teachers and students, with the primary goal being for students to recognize and comprehend each step needed to reach a logical conclusion. Project-based learning is notably a promising teaching method in education that has gained momentum and lots of potentials to enhance social science process skills and engages students in real-world tasks. On the other hand, practical method of teaching which is seen as a teaching method that gives the students first-hand information of living and non-living organisms and its processes is a must for CRS students and should be embraced as it will increase the students' enthusiasm to develop interest in any course of study.

According to Omeodu (2018), project-based learning increases knowledge acquisition of the learners, develops skills and competencies required to meet scientific and technological demands of the nation, makes scientific phenomena more real and during the practices, social interaction is enhanced. When CRS is taught through practical activities (experimentation), it is expected that the students learn more, retain it longer, seem more satisfied with their practical work, and do better on exams than when other teaching strategies are used.

The best way for most students to enhance their learning and acquisition of social science process skills is through hands-on activities. As noted by Hamisu (2017), it helps them to progress within each topic from the handling of actual objects to a stage where pictures or diagrams can be used to represent these objects and finally to a stage where symbols are used that can be manipulated in abstract ways. This allows them to think through the biological ideas that are contained within the various activities they undertake at the same time they are carrying out these activities. Practical method is no doubt a teaching method that engages the students to conduct laboratory experiments, observe and analyze phenomena over the theory aspects learned on a topic or before the topic with the ethics of science inculcated into the students in the process of the practical activity. This practical learning method which can be done in the laboratory, workshop and as a field trip, etc. will nurture, guide and develop the students' interests as they look forward to learn CRS which will in turn enhance the interest of the students. Moreover, the students' social science process skills may not only be affected by the teaching methods used in teaching but also may be influenced by students' gender.

Gender is a significant variable in educational research, academics and educators continue to be concerned about it. The difficulties surrounding gender equity have become more nuanced and sophisticated in recent years, making it impossible to completely benefit from education in a setting where stereotypes of gender discrimination are fostered (Muokwe, 2021). Gender bias remains widespread in Nigeria, continuing even in science classrooms. It is concerning that female students still believe that projects and practical work are the domain of men, and this belief has caused them to become disinterested in the task

given to them. Therefore, it is important to plan and implement science education activities such that boys and girls have equal opportunity to learn and apply science. Teachers should also give work in groups and not gender based like boys should bring these while girls should bring this, let all be grouped together irrespective of gender so that the females will not feel that difficult work or concepts are done by the males.

It is obvious that students will acquire, develop social science process skills in CRS lessons if given the opportunity, time and gender unbiased to do practical and project activities on their own. Hence the need for the study, effects of practical and project-based learning on students' social science process skills acquisition in CRS in Awka Education Zone.

Purpose of the Study

The main purpose of the study is to examine the effects of practical and project-based learning approaches on students' social science process skills acquisition in CRS in Awka Education Zone. Specifically, the study sought to determine the:

1. Social science process skills acquisition mean scores of students exposed to practical and project-based learning in CRS in Awka Education Zone.
2. Science process skill acquisition mean scores of male and female students when taught CRS using practical and project-based learning approach in Awka Education Zone

Research Questions

The study seeks to find answers to the following research questions:

1. What are the social science process skill acquisition mean scores of students exposed to practical and project-based learning in CRS Awka Education Zone?
2. What are the social science process skill acquisition mean scores of male and female students when taught CRS using practical and project-based learning approach in Awka Education Zone?

Hypotheses

The following hypotheses were formulated for the study and they were tested at 0.05 level of significance.

1. There is no significant difference in the social science process skills acquisition mean scores of students exposed to practical and project-based learning in CRS.
2. There is no significant difference in the mean scores of male and female students in science process skill acquisition when taught CRS using practical and project-based learning approach.

Method

The study adopted a quasi-experimental research design of pre-test and post-test. The study was carried out in Awka Education Zone of Anambra State. The population of this study comprised of all the 1098 (senior secondary year two CRS students (546 males and 552 females) that are offering CRS in Awka Education Zone of Anambra State. The

sample for the study was one hundred and five (105) CRS students (57 males and 48 females). The sample of the study was obtained using multi-stage sampling procedure in five stages. The instruments that were used for data collection for this study was Social science process skills Acquisition Test (SPSAT). The instruments were validated by three experts. The reliability coefficient of the SPSAT was established using Kuder Richardson Formula 20 and internal consistency of 0.94 was obtained. Mean and Standard Deviation were used to answer the research questions. Analysis of Covariance (ANCOVA) was used to test the hypothesis at 0.05 level of significance ($p<0.05$). It was used in order to eliminate the error of non-equivalence.

Results

Research Question 1: What are the social science process skill acquisition mean scores of students exposed to practical and project-based learning in CRS Awka Education Zone?

Table 1: Mean and Standard Deviation of social Science Process Skill Acquisition Scores of Students Exposed to Practical and Project-based Learning in CRS

		Pretest		Posttest		
Groups	N	Mean	SD	Mean	SD	Mean Gain
Practical	48	40.08	13.25	77.60	5.52	37.52
Project	57	32.47	12.64	70.30	9.66	37.83.

The result presented in Table 1 reveals the pretest and post-test science process skill acquisition scores of students taught CRS using practical and project-based learning approaches. The pretest mean science process skill acquisition scores for the groups in the practical and project-based learning are 40.08 and 32.47 with standard deviation scores of 13.25 and 12.64 respectively. The post-test mean science process skill acquisition scores are 77.60 and 70.30 with standard deviation scores of 5.52 and 9.66. The standard deviation scores for the pretest for both groups were higher than the standard deviations for the posttest. This suggests more variability in the pretest mean science process skill acquisition scores of the students than the posttest mean science process skill acquisition scores. More of the scores near the mean in the pretest than in the post test. Since the pretest mean science process skill acquisition score is smaller than the posttest mean science process skill acquisition score in both groups, the practical based learning improves students' science process skill acquisition in CRS than project-based learning.

More so, the mean gain science process skill acquisition scores of students taught CRS using Practical and those taught using project-based learning are 37.52 and 37.83 which depicts that the students in the practical based learning taught CRS have

higher science process skill acquisition score than those taught the same CRS concept using project-based learning.

Research Question 2: What are the science process skill acquisition mean scores of male and female students when taught CRS using practical and project-based learning approach in Awka Education Zone?

Table 2: Mean and Standard Deviation of Science Process Skill Acquisition Scores of Male and Female Students Exposed to Practical and Project-based Learning in CRS

		Pretest		Posttest		
Groups	N	Mean	SD	Mean	SD	Mean Gain
Practical	48					
Male	26	37.92	13.89	77.46	6.75	39.54
Female	22	42.64	12.27	77.77	3.74	35.13
Project	57					
Male	31	33.77	12.95	71.58	9.48	37.81
Female	26	29.09	9.82	69.81	11.17	40.72

Table 2 shows mean and standard deviation science process skill acquisition scores of male and female students taught CRS using practical and project-based learning. From the result the pretest and posttest mean science process skill acquisition score of male students taught CRS using practical based learning were 37.92 and 77.46 while the standard deviations were 13. 89 and 6.75 with mean gain scores of 39.54. Also, the pretest and posttest mean of science process skill acquisition score of female students taught CRS using practical based learning were 42.64 and 77.77 while the standard deviations were 12.27 and 3.74 with mean gain scores of 35.13. The standard deviation scores in pretest for the male and female students were higher than the standard deviations in posttest. This suggests more variability in pretest scores than the posttest scores in both male and female students taught CRS using practical based learning. Since posttest mean score for female is higher than the posttest mean score of the male, the female students' science process skill acquisition is higher than their male counterpart in use of practical based learning.

More so, the result from table 2 also reveals that the pretest and posttest mean science process skill acquisition score of male students taught CRS using project-based learning were 33.77 and 71.58 while the standard deviations were 12.95 and 9.48 with mean gain scores of 37.81. Also, the pretest and posttest were 29.09 and 69.81 while the standard deviations were 9.82 and 11.17 with mean gain scores of 40.72. The standard deviation scores for the pretest for male students is higher than the standard deviations for posttest. This suggests more variability in pretest scores of male students than their posttest scores. While the standard deviation scores for the pretest for female students is lower than the standard deviations for posttest. This suggests more variability in posttest scores of female students than their pretest scores. This implies that male

students' science process skill acquisition is better than their female counterpart in the use of project-based learning in the CRS concepts taught.

Hypothesis 1: There is no significant difference in the social science process skills acquisition mean scores of students exposed to practical and project-based learning in CRS.

Table 3: Analysis of Covariance (ANCOVA) of Students' Mean Social science process skills Acquisition Scores between Practical and Project-based Learning in CRS.

Source	Type III Sum of Squares	df	Mean Square	F	Sig	Decision
Corrected Mode	l1571.035[a]	2	785.517	4.679	.011	
Intercept	1022.432	1	1022.432	6.090	.015	
Posttest Practical And Project SPSAT Learning Strategies	62.150	1	62.150	.370	.544	.004
Practical And Project	1027.562	1	1027.562	6.120	.015	S
Error	17125.727	102	167.899			
Total	154417.000	105				
Corrected Total	18696.762	104				

a. R Squared = .084 (Adjusted R Squared = .066)

b. Computed using alpha = .05

The results in Table 5 reveals that there is significant difference in the social science process skills acquisition mean scores of students exposed to practical and project-based learning in CRS, F (1,1027.562) = 6.120, p = 0.015. Since the obtained p-value is less than the stipulated 0.05 level of significance, the null hypothesis which stated that there is no significant difference in the social science process skills acquisition mean scores of students exposed to practical and project-based learning in CRS is thereby rejected. This implies that the mean social science process skills acquisition score of students taught CRS concept using practical and project-based learning has a significant difference in mean social science process skills acquisition scores in respect to this study. This implies that there is a significant difference in the social science process skills acquisition mean scores of students exposed to practical and project-based learning in CRS in favour of those taught with practical based learning.

Hypothesis 2: There is no significant difference in the mean scores of male and female students in science process skill acquisition when taught CRS using practical and project-based learning.

Table 4: Analysis of Covariance (ANCOVA) of Male and Female Students' Mean Social science process skills Acquisition Scores between Practical and Project-based Learning in CRS.

Source	Type III Sum of Squares	df	Mean Square	F	Sig	Decision
Corrected Mode	l756.838[a]	2	378.419	2.152	.122	
Intercept	448.667	1	448.667	2.551	.113	
Posttest Practical And Project SPSAT	509.467	1	509.467	2.897	.092	
Gender Practical And Project	213.366	1	213.366	1.213	.273	NS
Error	17939.924	102	175.882			
Total	154417.000	105				
Corrected Total	18696.762	104				

a. R Squared = .040 (Adjusted R Squared = .022)

b. Computed using alpha = .05

The results in Table 6 reveals that there is no significant difference in the mean scores of male and female students in science process skill acquisition when taught CRS using practical and project-based learning, F (1,213.366) =1.213, p = 0 .273. Since the obtained p-value greater than the stipulated 0.05 level of significance, the null hypothesis which stated that there is no significant difference in the mean scores of male and female students in science process skill acquisition when taught CRS using practical and project-based learning is uphold. This implies that there is no significant difference in the mean scores of male and female students in science process skill acquisition when taught CRS using practical and project-based learning.

Discussion of Findings

The findings of the study reveals that students in the practical based learning group taught CRS have higher science process skill acquisition score than those taught the same CRS concept using project-based learning in Table 1. The reason could be practical-based learning enables direct hands-on exploration, immediate feedback, and concrete variable manipulation. The finding is also in line with (Anaekwe and Nnaka, 2020) who indicated in their different findings that practical based learning improves students' science process acquisition more than traditional learning process. The study also shows that female students slightly have higher science process skill acquisition than their male counterpart in the use of practical based learning in the CRS concepts taught while male students'

science process skill acquisition is better than their female counterpart in the use of project-based learning in the CRS concepts taught. The findings of the study also show there is no significant interaction effect of gender and instructional strategies on the science process skill acquisition mean scores of students in CRS. This implies that the instructional strategies (practical and project-based) have equal effect on male and female students' science process skill acquisition in CRS concepts taught. The finding is in accordance with Abidoye (2017) who revealed the effectiveness of CRS teachers in science process skill of observing, inferring, classifying, communicating, measuring and predicting, interaction was not significantly influenced by gender and years of teaching experience.

Conclusion

Based on the investigation into effects of practical and project-based learning on students' science process acquisition in CRS in Awka Education Zone it can be concluded among others that students in the practical based learning taught CRS have higher science process skill acquisition score than those taught the same CRS concept using project-based learning. Furthermore, female students slightly have higher science process skill acquisition than their male counterpart in the use of practical based learning in the CRS concepts taught while male students' science process skill acquisition is better than their female counterpart in the use of project-based learning in the CRS concepts taught.

Recommendations

Based on the findings of the study, and the conclusion drawn, the following recommendations are made:

1. All stake holders should prioritize practical-based learning (PBL) for CRS instruction and other science instructions in science subjects.
2. Teachers should always give assessment that align with science process skill acquisitions and interest dimensions in CRS concepts so that the students will be acquainted with it.
3. As the use of practical-based learning of CRS teaching has been found to be effective in promoting achievement and interest of students in CRS and since research evidence has shown that it is rarely used by the teachers in classes, students should be expose to the use of role-play in learning of CRS in schools.
4. Government agencies and professional bodies whose responsibility is to design and revise curriculum for secondary schools should incorporate and emphasize the use of practical-based learning method in teaching of CRS in secondary schools.
5. Teachers of CRS should endevour to note that gender does not account for students' interest rather the method used by teachers in teaching a particular subject. Therefore they should often change their method of teaching in order to promote students' interest in CRS and achievement in secondary schools in Nigeria.

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