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COMPARATIVE ANALYSIS OF SECONDARY SCHOOL STUDENTS' PERFORMANCE IN BIOLOGY AND CHEMISTRY IN ONDO AND EKITI STATES, BEFORE COVID-19

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Abstracts: *Education is a fundamental process that facilitates human learning, skill development, and knowledge transfer. It plays a pivotal role in fostering economic growth, improving quality of life, and shaping societies. This study focuses on the performance of secondary school students in Biology and Chemistry in the Nigerian states of Ondo and Ekiti from 2015 to 2018. The research examines the comparative performance of these subjects and explores factors that might contribute to variations. Using an ex-post facto research design, the study analyzed data from the West African Senior School Certificate Examination (WASSCE) to determine academic outcomes. The results indicate significant differences in performance between the two subjects and the two states. Students in Ondo state performed better in Biology, while those in Ekiti state excelled in Chemistry. Factors that caused the differences in their performances included access to learning tools, student attitudes, students' resource availability, students' interpersonal relationship, students' regularity to class, parental education, and the learning environment, were discussed. The study suggested that laboratory facilities be improved, teacher should be trained, and class sizes be optimized to enhance student achievement.*

Keywords: *Comparative analysis; secondary school Students; Performance; Biolog; Chemistry.*

Introduction

Education is the entire process of human learning, including the transfer of knowledge, the use of faculties, and the development of skills. One of the most crucial elements of growth in any area is education. Without significant investments in human capital, no nation can attain long-term economic greatness. People's perspectives and understanding of the world around them are widened by education. Since education enhances people's quality of life, it is advantageous to both individuals and society. It improves people's overall health while enhancing their productivity and creativity. The growth of a nation is sometimes seen as being gauged by its level of education (Olojo, 2021). The aforementioned has highlighted the crucial role that education plays in bringing about positive social change to encourage and support a country's and its residents' overall growth. A child's education aims to increase their creativity and objectivity, among other things. It promotes a child's total development, which includes intellectual, moral, social, emotional, and physical growth. Students serve as the center of all educational activities, and education is frequently seen as a nation's primary driver of progress and development (Olojo, Boris, & Popoola, 2021).

The major objective of education should be to maximize profit by offering high-quality instruction that produces educated, skilled, and well-mannered people who match the needs and requirements of a quickly changing labor market. Education should be seen as a profitable industry. Every educational innovation will be a colossal failure without great academic accomplishment (Achombo, 2010). Therefore, it should always be attempted to maintain a high school level.

The classic definition of science is a rigorous examination of how nature functions with the aim of understanding and directing it for human benefit. It is a technique for gathering knowledge, including facts, guidelines, and theories. According to Pember and Humbe (2009), science education is an approach to teaching or training, typically in schools, to improve one's knowledge of the environment and to help one become more environmentally aware; to develop one's skill of systematic inquiry as well as attitudinal one's characteristics, and to help one become more environmentally aware. Science education focuses on sharing scientific knowledge with people who aren't typically regarded as being part of the scientific community, such as students, farmers, market vendors, or an entire community (Aina, 2013).

In addition to being crucial to Nigeria's educational system, secondary schools also bridge primary and post-secondary education. Asikhai (2010) asserts that secondary education should serve as the cornerstone and basis for future education at post-secondary institutions. Biology and chemistry are two of the three divisions of science taught in secondary schools in Nigeria. These subjects are essential to Nigeria's growth as a country and the achievement of its great potential. There are several problems with how science is taught in secondary schools nowadays. Fashina and Akanji (2017), claim that Biology has the greatest enrollment in Nigeria and the lowest test scores. In senior secondary classrooms, several variables work against students' academic performance in science in general and Biology and Chemistry in particular. Because it is important as the science of life, biology has a special place in the high school curriculum. The secondary biology curriculum in Nigeria aims to foster students' ability to apply scientific knowledge to everyday life in a variety of contexts, including personal, community, health, and agricultural issues (Federal Ministry of Education, 2009). Additionally, it seeks to increase students' knowledge of and enthusiasm for biological sciences. Chemistry is the branch of science that examines the characteristics of distinct atoms, how they combine to form molecules, the interactions between various types of molecules, and the resulting energy changes. Chemistry is a branch of science that studies the composition, structure, and characteristics of matter as well as the structural, compositional, and energetic changes brought about by chemical processes. Any country's technical advancement is dependent on its study of science, particularly chemistry (Eremie & Ekpete, 2008). As a science, chemistry is designed to help students learn about the nature of chemicals (such as facts, concepts, and principles), procedures, and attitudes before giving them the skills necessary to become professional chemists.

Purpose of the Study

The study investigated a comparative analysis of secondary school students' academic performance in Biology and Chemistry in the Ondo and Ekiti states. The study specifically examined:

i. comparative analysis of secondary school students' academic performance in Biology and Chemistry in the Ondo and Ekiti states

ii. performance of students in Biology and Chemistry subjects in the selected secondary schools in Ondo state?

iii. performance of students in the Biology and Chemistry subjects in public secondary schools in Ekiti State?

Research Questions

The following research questions were raised to guide the study:

i. What is the comparative analysis of secondary school students' academic performance in Biology and Chemistry in the Ondo and Ekiti states?

i. Does the performance of students in Biology and Chemistry subjects in the selected secondary schools in public secondary schools in Ondo state difference?
ii. Does the performance of students in the Biology and Chemistry subjects in public secondary schools in Ekiti State difference?

Research Hypotheses

This null hypothesis was generated for this study:

Ho1: There is no significant difference in students' performance in Biology and Chemistry subjects in public secondary schools in Ondo state

Ho2: There is no significant difference in students' performance in Biology and Chemistry in public secondary schools in Ekiti State.

Literature Review

Theoretical framework

Attribution theory by Bernard Weiner (1974)

Attribution theory is concerned with how individuals interpret events and how this relates to their thinking and behavior. Weirner developed a theoretical framework that has become a major research paradigm of social psychology. Attribution theory assumes that people try to determine why people do what they do either attribute causes to behavior. A person seeking to understand why another person did something may attribute one or more causes to that behavior.

A three-stage process underlines an attribution

1. The person must perceive or observe the behavior.
2. Then the person must believe that the behavior was intentionally performed.
3. The person must believe the other person was forced to perform the behavior (in which case the cause is attributed to the situation) or not (in which case the cause is attributed to the other person). Weiner focused his attribution theory on achievement (Weiner, 1974). He identified ability, effort, task difficulty, and hick as the most important factors affecting attributions for achievement.

Attributions are classified along three causal dimensions:

i. Locus control
ii. Stability
iii. Controllability
iv. The locus of control dimension has two poles:

v. internal versus external locus of control.

Weiner holds the following belief regarding hearing and education.

1. There is a significant relationship between attitude and achievement.
2. That people's behavior is attributed to internal and external causes that influence people's behavior (Wikipedia 2011). Maintain that our view of the world, our previous experiences with a particular person or situation, and our knowledge of the behavior play an important role in our attempt to explain the world and to determine the cause.
3. The students with higher ratings of themselves and with higher school achievement tend to attribute success to internal, stable, uncontrollable factors such as ability, while they attribute failure to either internal, uncontrollable factors such as efforts or external uncontrollable factors such as task difficulty.
4. Weiner emphasized the fact that students' disposition or attitude (internal factors) can cause poor academic achievement in chemistry.

1.1. 1. Theory of Constructivism by Jean Piaget (1955)

The theory of constructivism which was propounded by Jean Piaget states that people construct their understanding and knowledge of different things through experiencing things and reflecting on those experience; constructivism learning theory by Jean Piaget generally explain that; when a person or learner encounters with something new, first they have to reconcile it with their previous ideas and experiences, maybe to change what they believed or maybe to the new information as irrelevant. In his words, people are the active creators of their knowledge. Piaget elaborates on nine (9) principles that guide constructivism learning theory, learning is an active process whereby learners use sensory input and construct meaning out of it, the crucial action of constructing meaning is metal (cognitive) hence, it happens in the mind and people learn to learn as they learn. Other principles include; learning is a social activity so learning is intimately associated with learners' interactions with human beings and the environment around them. Learning uses language hence the language used to influence learning is contextual people learn about what is known believed and observable.

The theory of constructivism by Jean Piaget has relevance to this study because the theory is particularly applicable to the teaching and learning of various things including science subjects (biology and chemistry). Achievement is an outcome of learning; hence ways of learning determine outcome, or achievement in a science subject (biology and chemistry) is an outcome of how the subjects were learned. The process of teaching and learning science subjects involves asking questions, experimenting, observing, exploring, and assessing

and all those activities are elaborated as the main principles of constructivism learning theory. Its basic assumption is that learning is the construction of ideas, knowledge, and understanding through experience, observation, and reflection and there are independent variables that are the influencing factors in the process of learning biology and chemistry and have relation to dependent variables which are an academic achievement in grades.

Conceptual framework of the study

Academic Success and Student Attitudes

Knowledge of human behavior requires knowledge of attitude. An attitude is typically characterized as a complicated mental state comprising beliefs. Khan, Ramzan, Qadeer, and Hussion Ali (2011). According to Olatude (2009), it is a habitual tendency for an individual to react favorably or unfavorably to things, persons, groups of people, institutions, or events. The term is described as a subjective or mental preparation for action within the context of social psychology. It describes the way people behave and what they believe. What each person sees, hears, thinks, and does is determined by their attitudes. Since they are based on experience, they do not develop into automatic routine behavior. Both positive and bad attitudes are possible, such as prejudice. Interest or sentiment in studying science is expressed by one's attitude toward it. Olatude (2009), when someone approaches an issue, evaluates a concept, or chooses the sciences, they are said to be taking a scientific attitude. In any educational system, teachers play a crucial role. However, just because a teacher is competent doesn't mean that they will always have a favorable attitude toward teaching. Simply put, teacher attitudes matter because they have an impact on the students. The classroom atmosphere, which is influenced by students' self-efficacy and, in turn, their conduct, is greatly influenced by the attitudes of the teachers. According to Wolfolk (2007), all of these variables—which can broadly be classified as environment, personal characteristics, and behavior—interact and feed off one another in a cyclical fashion. According to Papanastasion (2001), people who have a good attitude toward science typically outperform their peers in the field. Science attitudes are learned, and classroom emotional behaviors are closely related to academic success.

Students' Resource Availability and Academic Achievement

Science examines natural phenomena. These phenomena cannot be adequately studied by just theoretical or abstract debate. Currently, math and science instruction in all educational systems is designed to include practical work. Most science students (Kwale SMASSE 2005) find that real things, models, or live things give phenomena enough concreteness to be grasped. A classroom teacher needs a variety of

teaching aids, including textbooks, equipment, chemicals, charts, models, movies, and other materials, to improve the quality of his or her education, according to Maundu, Muthwii, and Samili (2005). Any source of knowledge, skill, supply, or assistance qualifies as a resource. Resources are crucial for improving the conditions for teaching and learning (Frany, 2007). When using resources for learning, a variety of human senses are occasionally involved. This helps to express the desired aim and facilitates learning. Bhagwan (2005) notes that an increasing body of research in cognitive science indicates that students learn and remember information better when they are involved in "authentic" learning assignments. According to Twoli (2006), the school chemistry curriculum is more laboratory-based in many nations, and learning time is largely spent engaging in practical or hands-on activities. The teacher will supervise the students as they manage physical items, specimens, tools, and chemicals throughout the practical sessions, the author continues. Among many other advantages, this enhanced engagement between students and teachers has produced positive results. The degree to which students use learning resources, especially those that support the practical application of chemical principles in classes, greatly influences their overall performance in chemistry. In 2007, Frany. Only through the actual use of or contact with the materials will the learner be able to adequately acquire these concepts and skills. This is crucial in the sciences, where it has been shown that a hands-on approach to learning is essential for developing conceptual knowledge, the memory of the material given, and the capacity to think scientifically. According to Okafor (2009), 5% of the post-primary schools in Lagos State, Nigeria had a laboratory, and those that did had both people and material resources available. These elements, which are not peculiar to Lagos State alone, are probably going to have an impact on how well students perform in chemistry.

Students' Inter-Personal Relationship and Academic Achievement

Positive student-teacher relationships are a beneficial resource for students, according to Humre & Pianta (2006). They indicated that having a good relationship with a teacher enables students to work on themselves because they know they can rely on their teachers to identify and address problems when they arise. They concluded that developing strong and supportive relationships with teachers allows students to feel safer and more secure in the school environment, feel more competent, make more positive connections with peers, and achieve greater academic gains. They also advised that talking with a teacher and conducting classroom observations will provide important and unique information for designing interventions.

Field, crouch, Downer, Howes, Laparo, and Little (2012). Humre, and

Pianto Burchinal (2006). suggested that for learning to take place, teachers must be actively involved in interactions with students. In Downey (2008), conducted study synthesizing research in education on the elements that affect academic success. It was shown that teachers' one-on-one interactions with their students had a big impact. According to Downey's et al (2006) view, teachers should focus on their students' skills and set high, realistic expectations for achievement while also developing strong interpersonal relationships with them. Strong teacher-student relationships, which are essential to a student's academic achievement, should be founded on mutual respect, trust, and caring. Cohesion and a sense of belonging are also byproducts of these relationships.

Downey says in his conclusion that the study was a potent reminder of the importance of regular teacher-student interactions in the classroom. Children's intellectual development at home and school is closely tied to the social interactions in which it develops, according to Cazden (2001). Cazden thinks that building a learning environment where all the stakeholders are invested would have a beneficial impact on the learning that will take place. Embedded familiarity improves responsiveness, which plays a vital role in learning.

According to Marzano (2003), helpful question for anyone trying to understand elements that improve students' progress. He claims that decisions made at the school level have much less of an influence than those made by a single teacher. Showing interest in students as persons has a favorable effect on their learning, according to Marzano, who claims that "the core of effective teachers-student relationships is a healthy balance between dominance and cooperation" (Marzano, 2003).

Students' Regularity to Class and Academic Achievement

Since students who attend school regularly are more likely to thrive academically, regular attendance is vital (Pascopella, 2007). According to Stanca (2006), attending lectures has advantages for college students. Academic achievement, according to Scorts (2012), is defined as how well a student completes his or her assignments and studies. Grades are unquestionably the most well-known indicator of academic achievement. Grades are what students "score" for their classes, and overall term grades are typically a tallying or average of assignment and test scores. They can also be significantly influenced by other factors like attendance and the instructor's perception of the student.

Arulampalam, Naylor, and Smith (2012) revealed that while missing class appears to have an impact on students of lesser ability, it only appears to hurt more able students' progress. Park and Kerr (2000) used "A multinomial logit approach" to research the factors influencing academic accomplishment, and they found that class attendance had a

statistically significant impact on students' grades in those classes. Their research in particular showed that a student's poor attendance was statistically important in explaining why they obtained a D instead of an A, B, or C.

The statistical test used found that regular attendance in class was a major factor in reducing a student's likelihood of obtaining a D or F. Romer (2003) found, in his research, that students with better attendance had significantly higher mean GPAs than those with worse attendance. In a meta-analysis of the correlation between class attendance, grades, and student characteristics, Crede, Roch, and Kleszynka (2010) found that the highest performing students had either very good or very poor attendance and that these students in the lowest quintile grades were most likely to have average (rather than poor) attendance. Additionally, they note a decline after the gap between kids with average attendance and students with extremely good attendance was greater than the gap between the two.

According to a study by Jaykaran, Yadaau, Chavda, Kantharia, and Yadaau (2011) conducted in a school where it is suggested that attendance be made mandatory at a minimum of 70% rate as a criterion for students was divided into two groups; students who had at least 75% class attendance, it was found that there was a statistically significant difference between the two groups for mean marks. In the group where attendance was at least 75%, mean grades were higher.

Material and Method

The procedure of the data collection in this methodology is describe under the below sub heading: Methods, Background, Participants, Procedure, Results and Analysis. In this study, the ex-post facto research design was used. All students who took the West African Examination Council (WAEC) in the states of Ekiti and Ondo between 2015 and 2018 made up the study's population. Students who took the WAEC at secondary schools in Ekiti and Ondo State were chosen as the study's sample using a purposive sampling technique. An inventory of the outcomes from the Senior Secondary School Certificate Examination served as the study's tool. The inventory was used to gather student data for the West African Senior School Certificate Examination in May/June of 2014/2015, 2015/2016, 2016/2017, and 2017/2018 sessions in the scientific subjects of Biology and Chemistry. Letter of introduction was collected from the department of Science Education. This letter was given to the appropriate authorities in each of the selected sample secondary schools in which the results of the WAEC results was collected from. The external inspecting body had previously standardized the data gathered through the inventory; thus validity and reliability were not required. Analysis of Variance

(ANOVA) was used to test the stated hypothesis, with a significance level of 0.05, and frequency counts, percentages mean, and standard deviation was used in the analysis of the data gathered. The analysis employed frequency count and percentage to address the demographic data of the respondents, the research questions were analyzed with the use of mean and standard deviation and ANOVA analytical tool was used to test the hypotheses formulated at alpha level of 0.05 significance.

Results: Research Question One: What is the performance of students in Biology and Chemistry subjects in the selected secondary schools?

Table 1 revealed the performance of students in the three biology and chemistry in public secondary schools in Ondo State. The result showed that out of 1009 respondents in the 2014/2015 session, 681 representing 67.49% had between A1-C6 in Biology, and 547 representing 54.21% had A1-C6 in Chemistry. The result showed that out of 1261 respondents in the 2015/2016 session, 699 representing 55.43% had between A1-C6 in Biology while 586 representing 46.47% had A1-C6 in Chemistry.

The result showed that out of 1209 respondents in the 2016/2017 session, 813 representing 67.72% had between A1-C6 in Biology, and 702 representing 58.06% had A1-C6 in Chemistry. The result showed that out of 1283 respondents in the 2017/2018 session, 794 representing 61.89% had between A1-C6 in Biology, and 651 representing 50.74% had A1-C6 in Chemistry.

Table 1: *Performance of students in Biology and Chemistry*

Year	No. Reg.	BIOLOGY A1-C6 (%)	BIOLOGY D7-F9 (%)	CHEMISTRY A1-C6 (%)	CHEMISTRY D7-F9 (%)
2014/15	1009	681 (67.49)	382 (37.86)	547 (54.21)	462 (45.79)
2015/16	1261	699 (55.43)	562(44.57)	586 (46.47)	675 (53.53)
2016/17	1209	813 (67.72)	396 (32.28)	702 (58.06)	507 (41.94)
2017/18	1283	794 (61.89)	489 (38.11)	651 (50.74)	632 (49.26)

Results: Research Question Two: What is the mean average performance of students in the Biology and Chemistry subjects in public secondary schools in Ekiti State?

Table 2 revealed the performance of students in the two science subjects in public secondary schools in Ekiti State. The result showed that in the 2014/2015 session, out of 6691 students that sat for Biology,

3974 representing 59.4% had between A1-C6, and out of 6072 who sat for Chemistry respectively, 4580 representing 75.4% has between A1-C6 in Chemistry respectively.
The result further showed that in the 2015/2016 session, out of 2022 students that sat for Biology, 4730 representing 78.5% had between A1-C6, out of 5189 who sat for Chemistry respectively, and 4403 representing 84.9% has between A1-C6 in Chemistry.
Moreover, it was revealed that in the 2016/2017 session, out of 5641 students that sat for Biology, 4453 representing 78.9% had between A1-C6, and out of 5258 who sat for Chemistry, 4894 representing 93.1% has between A1-C6 in Chemistry.
Furthermore, it was shown that in the 2017/2018 session, out of 5578 students that sat for Biology, 4637 representing 83.1% had between A1-C6, and out of 5155 who sat for Chemistry, 4322 representing 76.9% has between A1-C6 in Chemistry.

Table 2:
Performance of students in Biology and Chemistry subjects

Year	Subject	No. Reg	A1 – C6 (%)	D7 – F9 (%)
2014/15	Biology	6691	3974 (59.4)	2717 (40.6)
	Chemistry	6072	4580 (75.4)	1492 (24.6)
2015/16	Biology	6022	4730 (78.5)	1292 (21.5)
	Chemistry	5189	4403 (84.9)	786 (15.1)
2016/17	Biology	5641	4453 (78.9)	1188 (21.1)
	Chemistry	5258	4894 (93.1)	364 (6.9)
2017/18	Biology	5578	4637 (83.1)	941 (16.9)
	Chemistry	5155	3964 (76.9)	1191 (23.1)

Testing of Hypotheses
Ho1: There is no significant difference in students' performance in Biology and Chemistry subjects in public secondary schools in Ondo state
The result in Table 3 presented in Table 5 showed that the F-cal value of 3.486 is significant because the P value (0.033) < 0.05 at 0.05. Hence, the null hypothesis is rejected. This implies that there is a significant difference in students' performance in the Biology and Chemistry subjects in public secondary schools in Ondo state. To investigate the source of the differences observed, Post – hoc analysis (Scheffe) with a mean difference was carried out.

Table 3:
Analysis of Variance (ANOVA) for the difference in students' performance in the two science subjects

Groups	SS	df	MSF	Sig.

Between Groups	.811	1	.405	3.486*.033
Within Groups	20.585	177	.116	
Total	21.396	179		

*P < 0.05

In Table 4, a significant difference was found between the performance of students in Biology and Chemistry in favor of students' performance in Biology. The result of the post – hoc test also showed that students performed best in Biology, followed by Physics while they performed least in Chemistry.

Table 4:
Post – hoc Analysis and Mean for Difference in Students' Performance in Biology and Chemistry Subjects

Groups	Mean	Biology	Chemistry
		2.6957	2.5333
Biology	2.6957		
Chemistry	2.5333	0.1623*	

* P < 0.05

Ho2: There is no significant difference in students' performance in Biology and Chemistry in public secondary schools in Ekiti State.

Result 5 presented in Table 5 showed that the F-cal value of 3.174 is significant because the P value (0.032) < 0.05. Hence, the null hypothesis is not upheld. This implies that there is a significant difference in students' performance in Biology and Chemistry in public secondary schools in Ekiti State. To investigate the source of the differences observed, post-hoc analysis (Scheffe) with a mean difference was carried out.

Table 5:
Analysis of Variance (ANOVA) computation for the difference in students' performance in the three science subjects

Groups	SS	df	MS	F	Sig.
Between Groups Within Groups	.711	1	87.062		
	585.709	2	295.240	3.174*	.032
Total	586.42	3	56.800		

In Table 6, a significant difference was found between the performance of students in Biology and Chemistry to the advantage of students in Chemistry. The result of Post-hoc test showed that students performed better in Chemistry than in Biology.

Table 6:
Post-hoc Analysis of Mean for differences in students' performance in the three science subjects

Groups	Mean	Biology	Chemistry
		3.2741	4.2133
Biology	3.2741	0.1537*	
Chemistry	4.2133		

*p<0.05

Summary of Major Findings

The following are the summary of major findings in this study;

1. The results indicated significant differences in performance between the two subjects and the two states.

2. There was significant difference in students' performance in the Biology and Chemistry subjects in public secondary schools in Ondo state. (Students in Ondo state performed better in Biology)

3. There was significant difference in students' performance in Biology and Chemistry in public secondary schools in Ekiti State. (Students in Ekiti state excelled in Chemistry.)

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Declaration of interest statement

The study was from Lecturers from university of Ilorin, Ilorin, Kwara State, Nigeria

Hereby, we as the authors consciously assure that for the manuscript " " the following is fulfilled:

This material is the authors' own original work, which has not been previously published elsewhere.

The paper reflects the authors' own research and analysis in a truthful and complete manner.

The results are appropriately placed in the context of prior and existing research.

All sources used are properly disclosed.

Discussion

The results of the study showed that there was a significant difference in students' performance in the biology and chemistry subjects in public secondary schools in Ondo state and Ekiti state, with a

significant difference found between students' performance in biology in Ondo state and students' performance in chemistry in Ekiti state. According to the results of the post-hoc test, students in Ondo State performed better in Biology than Chemistry, while in Ekiti State, students performed better in Chemistry than Biology. This may be related to the following factors that are responsible for students' performance that the provision of ICT / internet facilities is necessary for the accomplishment of all educational goals and objectives. This is in agreement with finding of Oludare et al., (2022) who observed Comparative analysis of secondary school student's performance in science subjects in Ekiti state, Nigeria and the result indicated better in performed in Chemistry than Biology.

The finding shows that Students in Ondo state performed better in Biology than the students in Ekiti State. This may be as a result that there were more opportunities for the student to participate actively in class and form meaningful relationships with both their peers and teachers. This is in the agreement with the finding of Mugure (2020) who observed the Impact of Resource Utilization in Education as Perceived by Teachers in Secondary Schools in Mathioya District, Muranga County and the finding shows better performance of the students.

The study shows that *Students in Ekiti state excelled in Chemistry in their performance. This may be as a result that* Students in smaller courses may have more opportunities to participate actively in class and form meaningful relationships with both their peers and teachers, in addition to having a more favorable learning environment. Demuyakor & Abakah (2018) Effects of information and communication technology on students' academic performance: A case study of the University of Education, Winneba. The result indicated that class size can also have an impact on academic attainment.

Conclusion

According to the results of this study, students at public secondary schools in the states of Ondo and Ekiti performed differently in the areas of biology and chemistry. Ondo students performed better in biology, while Ekiti students performed better in chemistry. Factors that caused the differences in their performances included access to learning tools, student attitudes, students' resource availability, students' inter-personal relationship, students' regularity to class, parental education, and learning environment, were discussed.

Recommendation

The following recommendations were given based on the study's findings, the government should make every effort to supply and outfit

schools' laboratories with enough tools and other facilities that contribute to a better lab. To improve teachers' effectiveness, the government could also assist and motivate them by periodically hosting workshops and training sessions on science-related topics. Parents and other education stakeholders should help governments by paying their fair share in schools. Enough time should be outlined in the schedule for both teaching and practicing science courses.

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