



The Impact of Contextual Teaching Approach on Divergent and Convergent Learning Styles

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ABSTRACT

This research aimed to examine the impact of the Contextual Approach on the academic performance of students with varying learning styles in the teaching of Electrochemistry compared to the traditional lecture method. The study was conducted among 4305 second-year chemistry students from sixteen public secondary schools in Bauchi State, Nigeria. A balloting method was used to randomly select 162 students (94 males), and 68 females), and ANOVA and Scheffes Post hoc were utilized to divide them into experimental and control groups based on their academic ability. To gather data, two tools were used: the Electrochemistry Performance Test (EPT) to assess student performance, and the Convergent and Divergent Identification Test (CDIT) to categorize them into convergent and divergent learning styles. Both instruments had reliability coefficients of $r = 0.70$ and $r = 0.60$, respectively. The study formulated three research questions and three null hypotheses, which were answered using descriptive statistics and tested using ANOVA and t-test. The research findings revealed that the Contextual Approach significantly improved the academic performance of divergent and convergent students in Electrochemistry, with the experimental group showing higher performance. Additionally, the performance of male and female convergent students did not differ significantly when exposed to Electrochemistry using the Contextual Approach, indicating that this teaching method is gender-friendly. Similarly, teaching Electrochemistry using the Contextual Approach significantly enhanced the performance of both male and female divergent students, suggesting that this approach is gender-inclusive. This finding contradicts earlier studies that suggested gender differences in mathematical abilities influence academic performance. To sum up, this research highlights the effectiveness of the Contextual Approach in improving the academic performance of students with different learning styles in the teaching of Electrochemistry.

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INTRODUCTION

Science and technological education serve as the cornerstone of most country's progress. This is founded on the notion that

science and technology provide a way to use a country's resources for its advancement efficiently. Brist (2012) defined scientific literacy as the development of attitudes, perspectives, and

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abilities necessary for adjusting to a constantly changing environment as well as the ability to solve problems and make decisions in daily life. According to Dantani (2011), students can use the knowledge they gain in math, physics, biology, health science, introductory technology, and chemistry to understand science and use it to solve problems in their rapidly changing society.

Chemistry, as an integral component of science, serves as a unifying force across all scientific disciplines. Ogenyi (2015) contends that it forms the cornerstone of a nation's pursuit of progress in science and technology. Chemistry involves grasping concepts, establishing principles, laws, and theories, along with engaging in substantial hands-on laboratory work. Oloyede (2010) recognizes the global significance of chemistry in national development. Dahiru (2013) underscores the crucial role of chemistry in all scientific and technological fields, making it imperative to include chemistry in the curriculum of post-primary education in Nigeria.

LITERATURE REVIEW

Electrochemistry which is a sub-discipline in chemistry Yakubu, Ezenwa, Wushishi, and Jonathan (2019), deal with the study of the relationship between conversions of chemical energy to electrical energy. Electrochemistry is a fundamental aspect of chemistry Ali and Yohannes (2022) rely on other aspects of chemistry for the integration of chemical knowledge because it includes the mole concept, chemical laws, redox equations, elements, and positions of ions in electrochemical series. Electrochemistry was reported as one of the difficult areas in chemistry by Ali et al. (2022) because students have conceptual difficulties an improper understanding of mole concepts, and an inability to write and balance chemical equations. Poor understanding of electrolytic laws and abstract methods used for teaching the concepts were some of the problems associated with the understanding of electrochemistry and chemistry subject. The history of electrochemistry is adventurous Ali et al. (2022) and has contributed to a crucial role in the advancement and development of chemistry and technology that structured the production of industry and daily life

in the 21st century. Despite the importance of chemistry evidence abounds that tends to support the claim of poor performance in the subject (Jegade 2010, Oloyede, 2010, Dahiru, 2013; Suleiman 2014). Eze (2002) and Adamu (2014), posited that the rationale for students' theoretical difficulty and underwhelming performance in Chemistry and electrochemistry was the persistent use of the lecture teaching method, which most students find lacking in interest. According to Njoku(2007) and Duniya (2016) approaches like demonstration, guided inquiry, and discovery teaching have been shown to improve student's performance but have not significantly assisted the learner in seeing the interconnected correlation present between academic aspects of chemistry subject provided in an academic setting and application in practical life situation. Okoli (2006) and Okeke (2018) proposed using an activity-oriented strategy that will allow students to excel in external examinations and apply the knowledge gained in everyday life. Innovative approaches such as class-wide peer tutoring, collateral instructional strategy, and Contextual Approach have been developed in teaching and learning science.

The contextual approach has been defined by Bannett (2003) and Elmas (2012) as the teaching of science in a way that learners will acquire knowledge and skills to solve real-life problems. Contextual teaching and learning, according to Peni (2011), helped learners apply topics and concepts to real-world scenarios. As a creative teaching method, also helped learners to apply the material learned to practical and real-world settings. Students learn from travel and experience faster than studying a textbook. Contextual teaching and learning practices do not only emphasize field trips but also involve practices such as learning by doing, problem-solving, and cooperative learning. Hudson & Whistler (2007); and Suleiman, Olorukooba, Jibrin, and Shuaibu (2019), saw contextual teaching and learning as an approach to learning that cannot be separated from behaviorism and constructivism theories.

Magwillang (2016) found that contextual learning was highly efficient in enhancing learners

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comprehension, academic success and fluency, mostly in chemical and energy topics. More so, it also builds up learners' self-efficacy in learning chemistry as a subject. Similarly, the results of Schwartz (2006) indicated that the contextual approach was better in terms of writing ability. Adam, Okebukola & Oladejo (2021) observed a meaningful difference in the mean scores (student achievement) of vocational students taught using the contextual approach and those students taught using the traditional lecture method. Sukri (2014) posited that the adoption of a contextual approach could enhance the learning outcome of students in solving mathematically inclined processes like "addition and reduction of fractions". Agustan, (2016), investigated collaborative versus contextual learning and students' achievements in biology subject among year II students in Omoku, Rivers State. The result revealed that students exposed to both collaborative and contextual instructions performed better significantly. It was also found that the two strategies were gender friendly. Nwabo and Aham (2015) observed that the populations of students in a class in most cases are made up of varying intellectuals and learning styles which to a large extent affect academic performance. Shuaibu (2017) posited that the classroom environment consists of students with different learning abilities and psychological constructs, some are extroverts, some are introverts, and some are independent personalities, while others are dependent personalities among others. In addition, students' thinking and information processing significantly differ, which has a direct impact on their academic performance in various subjects. Various documented cognitive styles influence students' academic performance according to Shuaibu (2017) including visual and haptic, visualized and verbalized, field dependent and field independent, holist and serialist, and convergent and divergent. According to Mukherjee (2002) and Adamu (2010), a converger is a learner who performs better in intelligence exams when compared to open-ended questions or exams. The convergent learner thinks along conventional lines in an attempt to find answers to problems. In this

context, an intelligence test is taken to be a test in which there is only one correct answer possible for every item of the test. Convergent thinking involves the generation of ideas from given information with an emphasis on conventionally acceptable problem solutions. On the other hand, a diverger is a learner who performs better, mostly in unrestricted exams than in intelligence exams. This refers to a learner with innovative and imaginative thinking that diverges from the typical and traditional way to generate alternative answers to a problem. Divergent learning is closely associated with creativity.

Researchers like Richmond, and Cummings (2005), Uzuntiryaki, (2007), and Dike (2011) believed that paying attention to the learning style of students is important in making learning and instruction attuned to the individual needs. Abubakar & Dantani (2005), and Dike (2011) were of the view that teachers should identify learners' preferred learning style and then modify their approach to teaching to match the students' learning style. Koe (2005) investigated the impact of convergent and divergent teaching on performance in biology among high school students in California America. The findings of the study among others revealed that the convergent and divergent instruction was more efficient in fostering convergent thinking' than the divergent one. Lipoff (2012) conducted similar research to investigate the performance of Convergent and Divergent Learning instruction in biology. The outcome revealed convergent students had performed better than divergent students in Nairobi Kenya. However, there was no observed difference in the performance of males and females taught using the same method of instruction.

STATEMENT OF PROBLEM

The variety of students' learning styles is one of several variables that can be blamed for poor performance in chemistry. Additionally, due to its abstract principles, mathematical complexity, multidisciplinary nature, and intricate laboratory work, electrochemistry poses significant difficulties for students. A creative teaching approach is necessary to effectively handle these

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issues, especially in light of the differences in students' educational experiences, skills, and various information processing styles. To encourage students to learn by exploring their environment, fostering cooperative learning, and including hands-on learning experiences, the researcher used the contextual approach as a teaching strategy. This strategy attempted to see how students with different learning styles, most especially the convergent and divergent students' involvement in electrochemistry can enhance various learning preferences and improve understanding and performance in this challenging field.

OBJECTIVES OF THE STUDY

This study focused on three objectives;

1. To determine the difference in the performance score of divergent and convergent learners taught Electrochemistry by the use of the Contextual Approach and those taught by the use of the traditional method?
2. To find out difference in the performance score of male convergent and female convergent learners taught Electrochemistry by the use of the Contextual Approach?
3. To examine the difference in the performance score of divergent male and divergent female learners taught Electrochemistry by the use of the Contextual Approach?

RESEARCH QUESTIONS

This study focused on three research questions:

1. Is there any difference in the performance score of divergent and convergent learners taught Electrochemistry by the use of the Contextual Approach and those taught by the use of the traditional method?
2. Is there any difference in the performance score of male convergent and female convergent learners taught Electrochemistry by the use of the Contextual Approach?
3. Is there any difference in performance scores of divergent male and divergent female

learners taught Electrochemistry by the use of the Contextual Approach?

NULL HYPOTHESES

Three null hypotheses were formulated and tested at a significant level of $P \leq 0.05$:

- H01:** There is no difference in performance scores of divergent and convergent learners taught Electrochemistry by the use of the Contextual Approach and those taught by the use of the traditional method.
- H02:** There is no difference in performance scores of convergent male and convergent female learners taught Electrochemistry by the use of the Contextual Approach.
- H03:** There is no difference in performance scores of divergent male and divergent female learners taught Electrochemistry by the use of the Contextual Approach.

MATERIALS AND METHODS

Quasi-experimental research design was used in this study. This comprised the experimental and the control. The experimental group was engaged in experimental treatment. That is, teaching using the Contextual Approach while the control was taught by the use of the conventional method without treatment. This design was prescribed by Kerlinger (1975). Two classes (one experimental and the other control groups) were used for the study. The participants in the two groups were subjected to a pretest to determine the equivalence in academic ability levels by using the Electrochemistry Performance Test (EPT). The two groups found to have equivalent mean scores were selected into the experimental and the control groups respectively, with the aid of balloting. Convergent and Divergent Identifications Test (CDIT) was given to both groups before treatment to identify the students' learning styles and categorize them into convergent and divergent students. The teaching was done for six weeks. The two groups were taught Electrochemistry Concepts in chemistry for six weeks.

Because gender was involved in the study, only co-educational schools were selected. Fourteen Schools in the population are co-

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educational, comprising 4305, (2116 males and 2189 females). The schools were divided into four groups based on the districts. The names of schools in the four groups under the population were written on separate pieces of paper and the papers were placed in four different containers. One school each was drawn out, one at a time, from the four containers using a simple balloting method. The four schools chosen were given the research instrument, EPT, to answer. This served as a pretest for the participants in the four schools chosen to compare the mean scores.

Furthermore, the pre-test results were subjected to Analysis of Variance (ANOVA) and Scheffe's test. Two schools that were found to have similar academic abilities were then chosen

as participants for the study. Two schools were then placed into experimental and control categories by using a simple balloting method. All the students from the two Classes selected were used for the study. The CDIT instrument was used to categorize the students into convergent and divergent students. The classification using CDIT indicated that the experimental group comprised 82 students. Convergent male students (34), and female students (22), divergent male students (14) and female students (12). While control group had 80 students which comprised of convergent male students (34) and female students (12), divergent male students (12) and female students (22) as reflected in Table 1.

Table 1: Sample of the Study

No	Schools	Male		Female		Total No
		Con.	Div.	Con.	Div.	
1.	Experimental (EG)	34	14	22	12	82
2.	Control (CG)	34	12	12	22	80
	Total	68	26	34	34	162

Source: Field Work (2021).

INSTRUMENTS

Electrochemistry Performance Test (EPT)

EPT was a performance test whose item was adapted from the West African Examination Council's past question papers between the years 2010 and 2020. It consisted of 50 structured multiple-choice items with one correct answer and three distracters for each set of items. The test covered all the topics taught. The Electrochemistry Performance Test (EPT) was used for pretest and posttest. A single score of 1 mark was awarded for each question.

Convergent and Divergent Identification Test (CDIT)

The CDIT was an instrument for the classification and identification of students into

- a. Basket = 5 marks
- b. Knife = 5 marks
- c. Bucket = 5 marks
- d. Cup = 5 marks
- e. Broom = 5 marks
- f. Spoon = 5 marks
- Total = 30 marks**

convergent and divergent learning styles. The instrument was made up of common objects that we use in homes and everyday life. These objects include a bucket, basket, broom, knife, and cup. They are called the Modified Use of Objects and Things Test adapted from Adamu, 2010, and Shuaibu, 2017). This test contains two sections Section A contains information like Name of school, admission number, and gender. Section B contains six (6) objects in the form of specimens and the Students were asked to write five (5) uses of each in 8 minutes. Each correct answer attracted 1 mark and the total mark for each object was 5 marks. The total for all six (6) objects was 30 marks.

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The test item is scored over thirty (30) and was used for categorizing the students into two learning styles (i.e. convergent and divergent) (Kolb, 2008; Adamu, 2010 & Shuaibu, 2017). Students' score between 0-14 marks was taken for convergers and scores between 15-30 marks were taken for Divergers.

RESULTS AND DISCUSSION

Research Question One: Is there any difference in performance scores of divergent and convergent learners taught Electrochemistry by the use of the Contextual Approach and those taught by the use of the traditional method?

Table 2: Post-test performance score of the Experimental and Control

<i>Dependent Variable: Performance</i>					
Group	Learning Styles	N	Mean	Std. Deviation	Mean diff
Experimental	Convergent	56	12.71	1.89	10.44
	Divergent	26	23.15	3.06	
Control	Convergent	46	8.54	1.33	7.96
	Divergent	34	16.50	2.14	
Experimental	Convergent	56	12.71	1.89	4.17
Control	Convergent	46	8.54	1.33	
Experimental	Divergent	26	23.15	3.06	6.65
Control	Divergent	34	16.50	2.14	
	Convergent	102	10.83	2.66	
	Divergent	60	19.38	4.19	
	Total	162	14.00	5.29	

Table 2 presents descriptive statistics revealing disparities in the performance scores of senior secondary school chemistry students categorized as divergent and convergent. In the experimental group, the mean scores for Divergent and Convergent students were 23.15 and 12.71, respectively, resulting in a mean difference of 10.44 in favor of Experimental Divergent students. Meanwhile, in the Control group, Divergent and Convergent students had mean scores of 16.50 and 8.54, with a mean difference of 7.96 in favor of Divergent students.

The table further highlights the mean scores of Experimental Convergent and Control Convergent, which were 12.71 and 8.54, respectively, showing a mean difference of 4.17 in favor of Experimental Convergent students.

Similarly, the mean scores for Divergent Experimental and Divergent Control were 23.15 and 16.50, respectively, with a mean difference of 6.65 favoring the divergent experimental group.

Overall, the descriptive statistics indicate higher mean performance scores for both Divergent and Convergent students in the experimental group compared to the control group. However, to ascertain the significance of these observed mean differences, hypothesis testing was conducted.

Null hypothesis one (H01): There is no difference in performance scores of divergent and convergent learners taught Electrochemistry by the use of the Contextual Approach and those taught by the use of the traditional method.



Table 3: Two-Way ANOVA on Academic Performance of Divergent and Convergent Students in Experimental and Control

Tests of Between-Subjects Effects						
Dependent Variable: Performance						
Source		Type III Sum of Squares	Df	Mean Square	F	Sig.
Intercept	Hypothesis	34523.484	1	34523.484	10.964	.187
	Error	3148.946	1	3148.946 ^a		
Group	Hypothesis	1090.291	1	1090.291	19.005	.144
	Error	57.370	1	57.370 ^b		
Styles	Hypothesis	3148.946	1	3148.946	54.889	.085
	Error	57.370	1	57.370 ^b		
Group * styles	Hypothesis	57.370	1	57.370	13.760	.000
	Error	658.726	158	4.169 ^c		

The results obtained from the two-way analysis of variance (ANOVA) indicate a notable distinction in the performance mean scores of senior secondary school chemistry students classified as divergent and converging. Specifically, the comparison involves the teaching of electrochemistry using the contextual approach versus the lecture method. The calculated p-value of 0.000 is below the 0.05 level of significance, and the computed F-value of 13.760 surpasses the F-critical value of 2.60 at df 1. These results suggest that the contextual approach is effective in

enhancing the understanding of electrochemistry concepts for both divergent and converging students in chemistry.

The study's findings reveal that the mean scores of the Experimental groups were significantly higher than those of the control group. Consequently, the null hypothesis, positing no significant difference in performance scores between divergent and convergent senior secondary school chemistry students taught using the contextual approach versus the traditional method was rejected.

Table 4. Scheffe's Post Hoc Multiple Comparisons of Performance Score of Divergent and Convergent Students of Experimental and Control.

(I) Group styles	(J) Group styles	Mean Difference (I-J)	Std. Error	Sig.
Exp Convergent	Exp Divergent	.40110	.39228	.790
	Control Convergent	10.09006*	.32892	.000
	Control Divergent	10.72689*	.35938	.000
Exp Divergent	Exp Convergent	-.40110	.39228	.790
	Control Convergent	9.68896*	.40557	.000
	Control Divergent	10.32579*	.43064	.000
Control Convergent	Exp Convergent	-10.09006*	.32892	.000
	Exp Divergent	-9.68896*	.40557	.000
	Control Divergent	.63683	.37384	.410
Control Divergent	Exp Convergent	-10.72689*	.35938	.000
	Exp Divergent	-10.32579*	.43064	.000
	Control Convergent	-.63683	.37384	.410

*Significant at the 0.05 level.

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Given the notable variations revealed in Table 2 through the 2-way ANOVA analysis, Scheffe's test (Post-Hoc Multiple Comparison) was utilized to pinpoint the specific differences among the four groups. Examining Table 2, it is evident that significant differences exist between the mean scores of the experimental and convergent control groups, as indicated by a calculated p-value of 0.000, which is below the alpha value of 0.05. Similarly, significant differences are observed between the academic performance mean scores of divergent Experimental and divergent control groups, with a calculated p-value of 0.000 also falling below the

alpha value of 0.05. This confirms the presence of significant differences among these pairs.

The findings indicate that both divergent and convergent students in the experimental group exhibited significantly superior academic performance compared to their counterparts in the control group. Consequently, the hypothesis suggesting no significant difference was rejected.

Research Question 2: Is there any difference in the performance score of male convergent and female convergent learners taught Electrochemistry by the use of the Contextual Approach?

Table 5: Posttest Performance Scores of Convergent Male and Convergent Female Experimental Category

Variable	Gender	N	Mean	STD	Mean difference
Performance	Male	34	12.97	1.80	0.65
	Female	22	12.32	1.99	

Table 5 shows the mean score of Convergent male students to be 12.97 and female students to be 12.31. The mean difference is 0.65 in favor of convergent male students.

Null Hypothesis Two (H02): There is no difference in performance scores of convergent male and convergent female learners taught Electrochemistry by the use of the Contextual Approach.

Table 6: t-test comparison of Academic Performance of Convergent Male and Convergent Female in Experimental Category.

Variable	Gender	N	Mean	STD	Mean difference	Df	t computed	t critical	P
Performance	Male	34	12.97	1.80	0.65	54	1.27	1.96	0.21
	Female	22	12.32	1.98					

Calculated $p > 0.05$, computed $t < 1.96$ at $df 54$

The independent t-test in Table 6 indicated no difference in performance scores of convergent male and convergent female senior secondary school students taught electrochemistry by the use Contextual Approach. This was proved by the fact that the calculated p-value of 0.21 is greater than the 0.05 alpha level of significance and the computed t-value of 1.27 is below the 1.96 critical values at df 54. The computed mean score performances are 12.97

and 12.32 for convergent males and Convergent females respectively. This indicates that male and female Convergent students when instructed through the Contextual approach exhibit similar average performance. The findings suggest that the contextual approach is equally beneficial for convergent males and convergent females. Therefore, we accepted and retained the null hypothesis, concluding that there is no significant difference.

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Research Question 3: Is there any difference in performance scores of divergent male and

divergent female learners taught Electrochemistry by the use of the Contextual Approach?

Table7: Posttest Performance Score of Divergent Male and Divergent Female in Experimental Category.

Variable	Gender	N	Mean	STD	Mean difference
Performance	Male	14	23.29	3.00	0.29
	Female	12	23.00	3.25	

Table 7 shows the performance scores of Divergent males and Divergent females in the experimental category were 23.29 and 23.00 respectively. A difference of 0.29 was observed in favor of divergent males.

Null Hypothesis Three (H03): There is no difference in performance scores of divergent male and divergent female learners taught Electrochemistry by the use of the Contextual Approach.

Table 8. T-test comparison of Performance Scores of Divergent Male and Divergent Female in Experimental category.

Variable	Gender	N	Mean	STD	Mean difference	Df	t computed	t critical	P
Performance	Male	14	23.29	3.00	0.29	24	0.23	1.96	0.82
	Female	12	23.00	3.25					

Calculated $p > 0.05$, computed $t < 1.96$ at $df 24$

According to the t-test in Table 8, there was no difference in performance scores of divergent male and divergent female senior secondary school Chemistry students who were taught using the Contextual Approach. The calculated p-value of 0.82 is higher than the 0.05 alpha value and the calculated t-value of 0.23 is below the 1.96t observed value at df 24. The computed mean performance Scores were 23.29 and 23.00 for male and female Divergent students, respectively. This shows that divergent males and divergent females taught by the use of contextual approach have the same mean performance. This implies that the contextual approach is effective for both genders in enhancing their performance.

Consecutively, the null hypothesis of no significant difference in performance mean scores of Divergent male and female students in the Experimental group was hereby accepted and retained.

DISCUSSION OF RESULTS

The result of testing hypothesis number one showed a significant difference in academic performance scores of divergent and convergent learners taught Electrochemistry by the use of contextual approach and those taught using the lecture method with the experimental group having higher performance. The difference observed between the two categories is likely to be a result of teaching with the contextual approach to the experimental category. If the treatment had no effect, the two categories would have performed equally. Since the experimental category performed better, it showed that the use of contextual approach for teaching divergent and convergent learners improves their performance. The finding was inline with the findings of Brist (2012) who reported the performance of students to improve when the relevancy of chemistry was related to daily life activities. Researchers like Ahmad (2013) also posited that the contextual approach helps learners to recognize and appreciate more vividly the connections between

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the science they study in school and daily life applications. Improved performance observed might be that the instructional strategy provides an opportunity for students to establish between concepts learned and the real-life application of chemistry as a physical science subject. Many researchers like Cheta (2019), Suryawati and Osman (2017), and Kazeem (2019) positioned that the Contextual Approach significantly improves the performance of Convergent and Divergent students in Physical Sciences as well as in chemistry.

The Second finding indicated that there was no difference between performance scores of convergent male and convergent female learners after exposure to electrochemistry concepts by the use of a contextual approach. Based on this hypothesis no significant difference was retained. This revealed that the contextual approach is gender friendly, irrespective of gender. Consequently, both genders received the same benefit from teaching by using a contextual approach. Contextual Approach can quite often stimulate a student to learn as much as possible. The finding is in agreement with those of Berenika (2014), and Suleiman et al. (2019) who reported that the Contextual Approach aids transfer of learning in male and female students alike.

Furthermore, the academic performance score of divergent male and divergent female learners in the experimental category. The finding showed that teaching using the Contextual Approach significantly improved divergent male and divergent female academic performance alike. This indicated that the contextual approach is gender friendly. Hence, the hypothesis of no significant difference between divergent male and divergent female learners exposed to electrochemistry concepts by the use of a contextual approach was retained. The finding was in line with the findings of Olorukooba, Sani and Kazeem (2016), who observed no difference in the performance of male and female learners. However, this result was not in conformity with those of Kachi (2012) and Boli et al (1985) who reported that one of the major difficulties leading to gender difference in academic performance is

the differences in mathematical abilities of male and female Science students.

CONCLUSION

The study made the following conclusions:

1. Students taught the electrochemistry concept of chemistry by using the contextual approach performed significantly better than those taught by the conventional (Lecture) method.
2. Contextual approach to teaching electrochemistry was found to be gender friendly on convergent male and female secondary school students
3. Contextual Approach to teaching Electrochemistry was also found to be gender friendly on divergent male and female secondary school chemistry students.

RECOMMENDATIONS

From the findings and conclusions made in this study, the following recommendations were provided:

1. The research revealed that the contextual approach enhanced the Performance of convergent and divergent learners in electrochemistry. The use of contextual teaching should therefore be encouraged in secondary schools in teaching chemistry.
2. It was also recommended colleges of education, universities, and allied educational institutions should adopt the use of a contextual approach in their curricula. This will ensure the development of its knowledge for teachers through training.
3. Professional bodies such as the Science Teachers Association of Nigeria (STAN), Chemistry Society of Nigeria (CSN), and institutes of research such as the Educational and Research Development Council (NERDC) should include the use of the contextual approach in science curricula in secondary school to encourage adoption of the strategy among

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- teachers. They should also organize workshops and seminars on how to use the contextual approach to teaching Chemistry in particular and science in general.
4. Authors and publishers of textbook materials for secondary school chemistry should expand the curricula to include the methodology used in this study on the use of the Contextual Approach

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