Impact of Ethnochemistry on Learners Achievement and Attitude towards Experimental Techniques

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Abstract: **This study was conducted to examine the impact of the Ethnochemistry teaching approach on learners' performance and attitude towards the topic of Chemistry Experimental Techniques as well as Chemistry in general. The quasi-experimental design of the pre-test, post-test approach was used in the study. The total sample size was 195 learners. To assess learners' performance, a pre-test and a post-test were administered to both the control and the experimental groups. Learners' attitude towards Experimental Techniques and Chemistry in general was assessed using a pre-test and post-test Attitude Questionnaire. The results for the performance pre-test and post-test were compared using independent-sample t-Test at an alpha (α) level set at 0.05.This showed a statistically significant difference in the post-test performance for control (M=42.75 ,SD=11.313) and Experimental (M= 70.85 ,SD=14.45) groups; t(38)=-6.85, P= .000. There was also a statistically significant difference in post-test attitude Scores for control (M= 50.5, SD=19.73) and experimental (M=85.5, SD=20.7) groups; t (193) =16.4, P= .000. This indicates that the Ethnochemistry teaching approach enhances learners' performance and enhances learners' positive attitude towards Experimental Techniques and Chemistry in general.**

Keywords**: Impact, Ethnochemistry, Achievement, Attitude, Learning and Experimental Techniques.**

I. INTRODUCTION

Chemistry has appealing experimental activities and fruitful knowledge for comprehending useful worldwide natural and manufacturing processes of science and technology important to society. Therefore, Chemistry learners need to transform instructional language or materials that teachers use in the classroom into meaningful representations. The principle aim of this study was to explore the impact of Ethnochemistry on learners' performance and attitude towards Experimental Techniques as well as attitude of learners' towards Chemistry in general.

The Ethnochemistry teaching approach brings out all the skills in an individual that can help them in everyday life. These skills include communication and presentation skills, organizational skills, research and inquiry skills, self-assessment and reflection skills, group participation and creativity. The approach further helps scaffold learners to construct their own knowledge while interacting with the environment (Wood Bruner, 1976). It brings the environment close to learners and makes them appreciate the role of cultural practices from the scientific point of view (Crawford, 1996).

The approach challenges students to learn through interaction with the environment (Kurume & Opra, 2008). Students determine their problem solving ability and learning needs, make knowledge operative and construct knowledge from real life problems and make sense of it based on what they already know. Social interaction plays a fundamental role in development of cognition (Vygotsky, 1978).

A separation technique is a scientific process or method that converts a mixture of chemical substances into two or more distinct product mixtures which are enriched in one or more mixtures constituents (Wilson & Adlard, 2005). That means substances that are physically combined and can easily be separated using a physical method of choice.

The knowledge and practical skills acquired in Chemistry can be extended to all sectors of the economy. For instant, Chemistry helps learners to comprehend what happens in the environmental world they live in and how it contributes to the quality of life on our planet (ware, 2001). Chemistry is cardinal in both social and economic life of a nation, therefore teaching of Chemistry should be done in such a manner that students have deep understanding of the subject.

Ethnochemistry can be defined as the study of chemical ideas found in any culture where appreciation of cultural heritage is preserved. It involves reflection on values, concepts and experience (Hill, 2010). Ethnochemistry deals with the study of specific cultural groups in the course dealing with environmental problems and activities using the groups' own ideologies (Singh & Chibuye, 2016). The Ethnochemistry teaching approach in this case is an approach adopted by the teacher in the learners' cultural background, in understanding, explaining and managing situations and activities arising in their own environment. This fosters a better understanding of how Chemistry is applied in our everyday lives. Ethnochemistry acts as a base and intermediate station for construction of reality by linking culture to advanced scientific knowledge. The value of Ethnochemistry creates social transformation, with the goal of creating more sustainable societies (Pais, 2010).

Ethnochemistry has been displaced in most classroom lessons but its richness fosters sustainability and environmental

integrity (Snively, 2001). Since sustainability is of great interest to students and others, it is important for Chemistry educators to introduce Ethnochemistry to learners' (Alkenhead, 1993 & Ogawa, 1995). One of the causes of poor achievement in senior secondary certificate examination in Senior Chemistry is having little or no interest in the subject (Olorundare, 2014).

Generally, Chemistry is regarded as a difficult subject to learners' at all levels (Odwayer, 2012). The majority of people are equally perplexed and disturbed by poor achievement of students in Chemistry (Olorundare, 2014). Borrowing an important inspiration in the book "Educate or perish: Africa's impasse and prospects" states: When lost, it's better to return to a familiar point before rushing on (Ki-zerbo,1990).The inclusion of Ethnochemistry in Chemistry lesson instructions would be of great value in addressing everyday challenges and avoid rote learning. In case of Zambian learners in Secondary Schools, there has been low performance in the topic of Experimental technique, Organic Chemistry and mole concept (Fafunwa, 1983). Usually an African child grows up with traditional cognitive style but when the child joins the formal education system, they find themselves in a foreign environment with a different cognitive orientation from the one they had experienced (Fafunwa, 1983).Cultural practices help learners to succeed in school and in life (D'Ambrosion, 2007).

Ethnochemistry is aimed at inculcating attitudes and values capable of integrating the individual into the wider Society (Majasan, 1967 & (Fajan, 1978). The ultimate objective is to produce a person guided by wisdom and serve as a buffer against all trials. Some cultural practices used in this study included the use of Tephrosia vogelli locally known as ububa to eradicate armyworms by local farmers on a small scale basis. This was used to teach the process of filtration in the Chemistry classroom. Fermentation of starch food to make Kachasu Beer was used to teach processes of distillation and condensation. Cassia abbreviata locally known as Umunsokansoka used by the local community as fever and Malaria medication was used to teach processes of decantation and filtration. Other cultural practices used in this study are the production of Munkoyo Drink, separation of maize grains from husks called shelling and winnowing , use of Aloe Vera (locally known as tembusha) used for bathing, the use of Umono tree (local name) to make lotion by the community.

1. *Main Research Objective*

a) Explore the impact of Ethnochemistry on learners' performance and attitude towards the topic of Experimental Techniques.

2. *Specific Research Objectives*

a) To explore the impact of Ethnochemistry on learners' performance in Experimental Techniques.

b) To explore the impact Ethnochemistry on learners attitudes towards Experimental Techniques and Chemistry in general.

3. *Main Research Questions*

1. What is the impact of Ethnochemistry on learner's performance in Experimental techniques?
2. What is the impact of Ethnochemistry on learner's attitude towards Experimental techniques and Chemistry in general?

II. RESEARCH METHODOLOGY

Research Design

Research design is an action plan for getting from here to there, where here maybe defined as the initial set of questions to be answered and there is some set of conclusion answer (Yin, 2003). It can also be defined as a plan for a study, providing the overall framework for collecting data (lead, 2010). A quasi-experimental study design using pre-test, post-test approach was adopted in this study as indicated in **table 1**. In quasi- experimental design there is no random assignment of participants to either the experimental or the control group (Campbel & stanely,1963). The experimental and control groups were selected as naturally assembled groups of intact classes.

Q1 is measurement before the treatment

Q2 is measurement after treatment.

Table 1: pre-test, post-test quasi-experimental design of the study

Groups	pre-test	treatment	post-test
Experimental	Q_1	Ethnochemistry	Q_2
Control	Q_1		Q_2

Study Population and Participants

In this study four co-education secondary schools of Lufwanyama District were involved in the research. The four schools comprised of Chapula Secondary School, Kalumbwa Secondary School, Mulemu Secondary School and Lufwanyama Boarding Secondary School.

Sample and Sampling Procedure

The sample for this study comprised of one hundred and ninety five (**195**) learners from the four afore mentioned secondary schools in the study district that consisted of eighty eight (88) boys and one hundred and seven (107) girls. Twenty (20) learners' from Chapula Secondary School were assigned to the experimental while another 20 learners' were assigned to the control group.

Both groups were subjected to pre-test and post-test to assess their performance. To assess Learners attitude, the control group was maintained at twenty (20) while the experimental group was increased to one hundred and seventy-five (175).

This was done to assess the broader attitude of learners. Both groups were subjected to pre-test and post-test attitude questionnaire to find out their attitude towards Experimental Techniques and Chemistry in general.

Instrument for Data Collection

The collecting data instruments used by the researcher comprised of Chemistry Achievement Test (CAT) and Chemistry Attitude Questionnaire (CAQ). The questions for the achievement test were prepared on the basis of modern scientific concepts and understanding on the topic of Experimental Techniques for the Grade 10. The attitude questionnaires had nineteen (19) items. Each item had five (5) Likert-scale choices comprising of strongly agree (SA)=5, agree (AG)=4, neutral (NT)=3, disagree (DG)=2 and strongly disagree (SD)=1. The validation of research instruments was done by teachers, peers and other education experts.

Ethical Consideration

In this research the researcher sought

Permission from the District Education Administrators, the School administrators and Science staff to carry out the research using Grade 10, 11 and 12 learners. Further, there was written informed consent of students willing to participate in the study.

Instrument Reliability

The achievement test items were piloted at Chapula Secondary School. This was administered to 20 learners of Grade 10 and 11 learners. The attitude questionnaire was also piloted to 30 learners comprising of Grades 10 and 11. The reliability of piloted attitude questionnaires was evaluated using the Cronbach's test in SPSS Version16.0.0.0. The reliability analysis was carried out on perceived task value scale comprising 19 items. Cronbach's alpha *(α)* showed the questionnaire to reach acceptable reliability *(α) =.731.* Most Items appeared to be worth of retention, resulting in a decrease in the alpha if deleted. The first attitude questionnaire had 26 items before testing for reliability but it was discovered that 7 items affected the Cronbach's value more, hence they were deleted to raise the Cronbach's alpha to .731.The first Cronbach's alpha recorded was .542, this reduced the number of items to 19 (Cronbach,1982 & Pintrich & DeGroot,1990).

Method of Data Collection

At the onset of the experiment, the researcher administered the pre-test to the learners of both groups. Scores on the pre-test were recorded and kept for use after the effecting experiment. At the end of the experiment, the post-test was again administered to participants.

Data Analysis

The measurements before and after treatment was analyzed using the independent sample test. The level of significance for acceptance or rejection of the null hypothesis was set at ά = 0.05 at confidence level of 95%. The statistical package for social sciences (SPSS) version 16.0.0.0 was used [28].

III. PRESENTATION AND ANALYSIS OF FINDINGS

Introduction

The following sets of results were generated:

a) Pre-test results for the control and experimental group
b) Post-test results for the control and experimental group
c) Pre-test attitude questionnaire for the control and experimental group
d) Post-test attitude questionnaire for the control and experimental group.

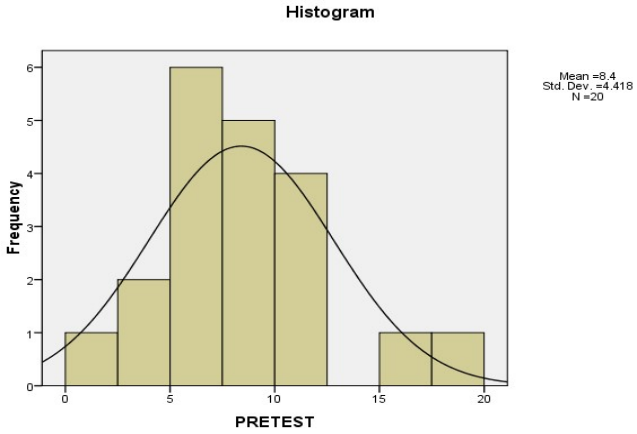

Figure 2: Histogram showing pre-test results for the control group (N=20)

The mean score of the control group was 8.4 and the standard deviation of 4.418 as indicated in *figure 2.* The skewness of the data was .761, indicating that most of the learners had marks less than 8.4.

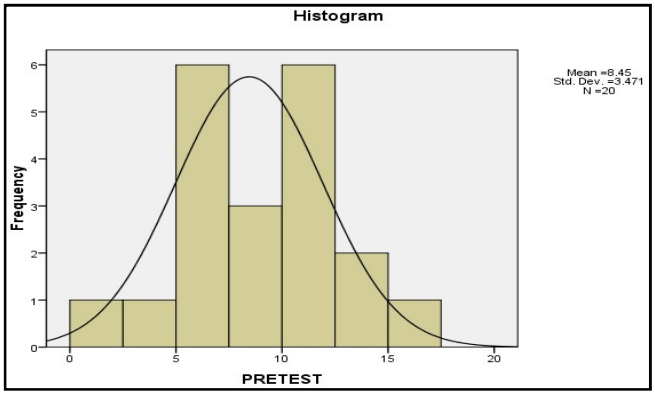

Figure 3: Histogram showing pre-test results for the Experimental group (N=20)

The mean score was 8.45 and the standard deviation of 3.471as shown in *figure 3.* The skewness was -.313, indicating that half of the learners had marks less than 8.4. The pre-test results obtained from both the control and experimental group, shows that the two groups were equivalent.

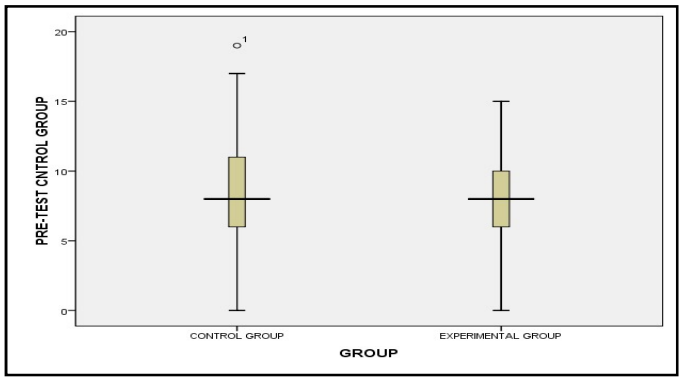

Figure 4: Pre-test results using the box plot

The box plot in *figure 4* indicate that learner number one got 19 as the highest mark in the control group and the majority got marks between 5 and 10. There was no significant difference in the pre-test results for control and experimental group. The p-value for the control group using Shapiro-Wilk was .215 and for the experimental group it was 0.603. Since the p-value was greater than the set alpha (ά=0.05) value for either group, the null hypothesis was not rejected and the data was normally distributed.

Table 2: The pre-test independent sample t-test

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
AVERAGE SCORE	Equal variances assumed	.425	.519	-.040	38	.968	-.050	1.256	-2.593	2.493
	Equal variances not assumed			-.040	35.987	.968	-.050	1.256	-2.598	2.498

The independent sample t-test was done at 95% confidence interval of the difference. The t-test for equality of mean showed that the p-value for equal variance assumed and equal variance not assumed was .968 as indicated in *table 2*, this indicates that the p-value was more than the set alpha value. Hence there was no significant difference in pre-test results for the control and experimental group.

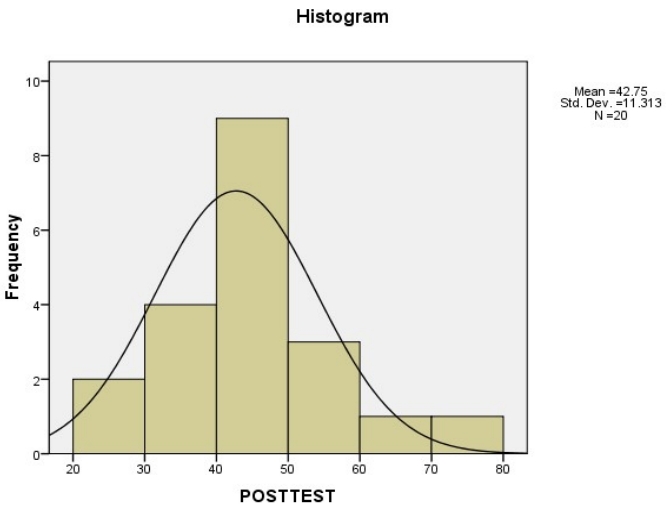

Figure 5: Histogram showing post-test results for the control group (N=20)

The results from *figure 5* indicate that the mean score was 42.75 and the standard deviation was 11.313. Its skewness was .279 indicates that the majority of learners' had marks less than the average score of 42.75. The minimum score of the learners in the control group was 20 while the maximum score recorded was 70.

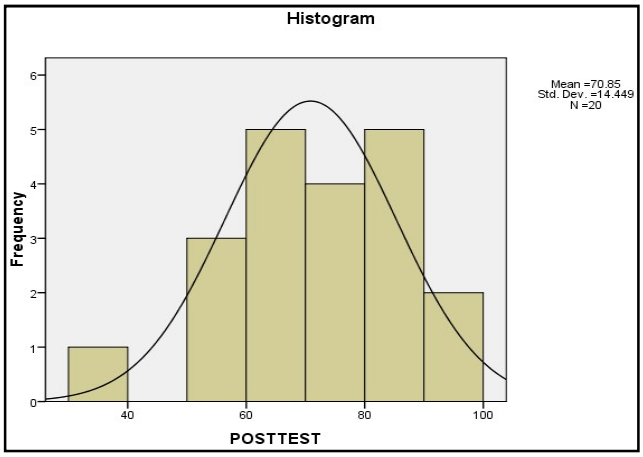

Figure 6: Histogram showing post-test results for the experimental group (N=20)

The results from *figure 6* indicate that the mean score was 70.85 and the standard deviation was 14.449. The histogram's skewness was -0.388. This indicates that one learner had the lowest mark of less than 40. The minimum score of the learners in the experimental group was 38 and the maximum score recorded was 95.

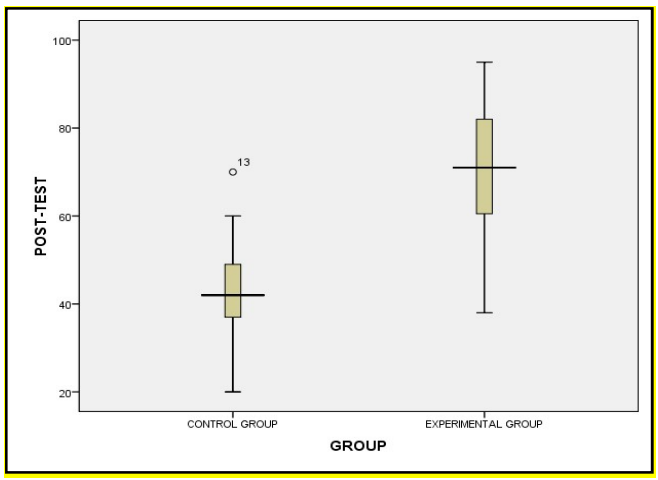

Figure 7: The post-test results using the box plot

The box plot in *figure 7* indicates that learner number thirteen (13) got 70% as the highest mark in the control group and the majority got marks between 40 and 45. In the experimental group, the highest mark obtained was 95% and the lowest was thirtieths (38). The majority got marks between 60% and 80%.This clearly indicates that there was significant difference in the post-test results for control and experimental group. The p-value for the control and the experimental group using Shapiro-Wilk was 0.796 and 0.965 respectively. The P-value was greater than the set alpha (ά) value, hence the null hypothesis was not rejected and the data was normally distributed.

Table 3: Table showing the independent sample t-test for the post-test results

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
AVERAGE SCORE	Equal variances assumed	1.580	.216	-6.85	38	.000	-28.100	4.103	-36.407	19.793
	Equal variances not assumed			-6.848	35.9	.000	-28.100	4.103	-36.423	19.777

The independent sample t-test was done at 95% confidence interval of the difference. The independent sample test for equality of mean showed that t=-6.85 with the p-value for equal variance assumed and equal variance not assumed was .000 as shown in *table 3.* This indicates that there was a significant difference in post-test results for the control and experimental group.

Table 4: The pre-test attitude questionnaire results

S/N	QUESTIONNAIRE STATEMENT	PERCENTAGE MEAN ATTITUDE SCORE	
		CONTROL (N=20)	EXPERIMENTAL (N=175)
1	Experimental technique is a very boring topic.	3.8	4.04
2	Experimental technique is a very difficult topic.	2.31	3.50
3	Chemistry is too involving, normally people who study Chemistry do not have time to socialize and do not spend more time with their families.	4.20	3.97
4	It would be very interesting to work as a chemist.	2.0	3.58
5	Chemistry has destroyed the entire world. The Chemist have produced harmful substances which have caused more harm than ever.	3.60	3.95
6	People go for Chemist as their second option career.	4.30	4.13
7	Chemistry is for people who are naturally intelligent or gifted ones.	3.65	3.94
8	Use of chemical ideas found in any culture in Experimental technique lessons Increase learner's performance.	2.35	1.90
9	Inclusion of chemical ideas found in any culture in Experimental techniques lessons motivate learners and make them eager to learn.	2.30	2.11
10	Cultural chemical ideas in experimental technique lessons would increase learners scientific Literacy.	2.10	2.02
11	Ethnochemistry help people know the role of chemistry in the society, appreciate the cultural conditions and develop investigative procedures.	2.45	1.63

12	Cultural Chemical examples helps learners understand the relationship of the society, ethics, including basic concepts on the relationship between chemistry and humanities.	2.40	1.83
13	Chemistry lessons should address the needs of the community. Hence, embracing Ethnochemistry in experimental technique lessons enable learners to grasp the concept and acquire lifelong skills.	1.70	2.43
14	Experimental technique should be taught according to what the country has. This makes it easy to expand knowledge because of familiarity with resources used.	2.25	1.85
15	Concept development depends on learners prior knowledge, emerges directly from child's interaction with the world. It depends on the basis of experience in one's environment.	2.25	1.89
16	Lack of local chemical ideas make some learners lose interest in chemistry because it creates a barrier in their lives.	1.95	1.98
17	Cultural chemical ideas, Believes, Values and Skills can improve learner's performance.	1.80	1.49
18	Cultural chemical ideas, believes, Values and Skills cannot Increase learners interest in learning Chemistry.	3.05	4.23
19	Do you have any recommendation to share with us basing on Ethnochemistry approach?		
TOTAL ATITUDE		48.5	50.5
AVERAGE ATTITUDE		2.69	2.80

The findings in *table 4* show that respondents had varied attitudes towards Experimental Techniques and Chemistry in general. This was observed on the responses given on the attitude questionnaire items. The mean attitude score for the control group was 2.69 whereas the mean attitude score for the experimental group was 2.80. This indicates that the two groups were equivalent in attitude towards Experimental Techniques and Chemistry in general before the intervention. Most of the participants' attitude was on disagree going towards neutral on the Likert Scale.

Post-Test Attitude Questionaire Results

The mean attitude score for the control group was 2.80 whereas the mean attitude score for the experimental group was 3.3 as indicated in *figure 8*. The average attitude score for each respondent in the experimental group after the intervention was in the range of 2.3 to 4.2.

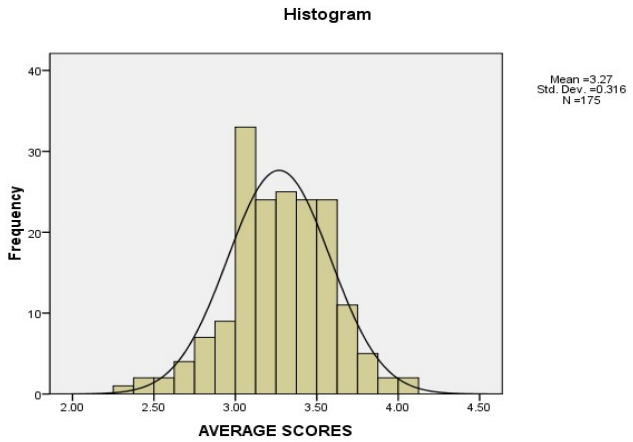

Figure 8: Post-test average attitude scores for the experimental group.

The mean score was 3.3 positive attitudes as shown in *table 5*. This show that most of the learners' attitude was neutral going towards to agree.

Table 5: The post-test attitude questionnaire results

S/N	QUESTIONNAIRE STATEMENT	PERCENTAGE MEAN ATTITUDE SCORE	
		CONTROL (N=20)	EXPERIMENTAL (N=175)
1	Experimental technique is a very boring topic.	3.80	2.37
2	Experimental technique is a very difficult topic.	4.24	3.60
3	Chemistry is too involving, normally people who study Chemistry do not have time to socialize and do not spend more time with their families.	3.95	2.25
4	It would be very interesting to work as a chemist.	2.20	3.58
5	Chemistry has destroyed the entire world. The Chemist have produced harmful substances which have caused more harm than ever.	3.50	3.17
6	People go for Chemist as their second option career.	4.25	2.07
7	Chemistry is for people who are naturally intelligent or gifted ones.	3.75	2.70
8	Use of chemical ideas found in any culture in Experimental technique lessons Increase learner's performance.	2.20	3.74
9	Inclusion of chemical ideas found in any culture in Experimental techniques lessons motivate learners and make them eager to learn.	2.25	3.87

10	Cultural chemical ideas in experimental technique lessons would increase learners scientific Literacy.	2.0	3.27
11	Ethnochemistry help people know the role of chemistry in the society, appreciate the cultural conditions and develop investigative procedures.	2.35	3.82
12	Cultural Chemical examples helps learners understand the relationship of the society, ethics, including basic concepts on the relationship between chemistry and humanities.	2.30	3.85
13	Chemistry lessons should address the needs of the community. Hence, embracing Ethnochemistry in experimental technique lessons enable learners to grasp the concept and acquire lifelong skills.	1.90	3.64
14	Experimental technique should be taught according to what the country has. This makes it easy to expand knowledge because of familiarity with resources used.	2.15	3.26
15	Concept development depends on learners prior knowledge, emerges directly from child's interaction with the world. It depends on the basis of experience in one's environment.	2.05	3.78
16	Lack of local chemical ideas make some learners lose interest in chemistry because it creates a barrier in their lives.	1.95	3.46
17	Cultural chemical ideas, Believes, Values and Skills can improve learner's performance.	1.90	3.80
18	Cultural chemical ideas, believes, Values and Skills cannot Increase learners interest in learning Chemistry.	3.80	2.29
19	Do you have any recommendation to share with us basing on Ethnochemistry approach?		
TOTAL ATITUDE		50.5	85.5
AVERAGE ATTITUDE		2.81	3.3

Table 6: Showing the independent sample t-test for the post-test attitude Questionnaire

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
AVERAGE SCORE	Equal variances assumed	.580	.447	16.377	193	.000	1.21683	.07430	1.07029	1.36337
	Equal variances not assumed			16.428	23.594	.000	1.21683	.07407	1.06382	1.36984

The independent sample t-test (t=16.4, p=0.000) was done at 95% confidence interval of the difference as shown in *table 6.* The independent sample test for equality of mean showed that the p-value for equal variance assumed and equal variance not

Assumed was .000, a p-value less than the set alpha value ($\alpha = 0.05$). Results show that there was significant difference in post test results of control and experimental group.

IV. DISCUSSION

Impact of Ethnochemistry on Learners' Achievement and Attitude towards Experimental Techniques and Chemistry In General.

Based on the results obtained on pre-test and post-test of the control and experimental group, it was shown that Ethnochemistry teaching approach had a positive impact on learners' performance. The results are in agreement with (Ausubel,1996) who believed that learning new knowledge relies on prior knowledge, that is, construction of knowledge begins with our observations and recognition of events and objects through concepts we already have. Meaningful learning has privilege of being transferred to long-term memory. The results in this research are also in line with (D'Ambrosion,2007). The performance of learners after the treatment was yoked to the Ethnochemistry teaching approach. Learners' performance is enhanced because of incorporating cultural activities into Chemistry instructions (Singh & Chibuye, 2016).The analysis of pre-test and post-test results, showed that Ethnochemistry Teaching Approach enhances learners' attitude towards Experimental Techniques and Chemistry in general. This can be seen from learners responses on the pre-test attitude questionnaire, where the average attitude score ranged from disagree going towards neutral attitude whereas in post-test attitude questionnaire, the average attitude score ranged from neutral going towards agree. This showed a positive attitude shift towards Experimental Techniques and Chemistry in general. The results were also in agreement with (Kalebaila & Hamukale, 2020) who found that social cultural activities have greater impact on learners' attitude and academic performance.

Ethnochemistry teaching approach involves situational learning and problem solving in a real life context where the environment is rich in information with physical materials (Kurumel & opra, 2008).

V. CONCLUSION

Based on the results of study, it was concluded that the Ethnochemistry Teaching Approach helps to bring the environment and material for Chemistry instructions close to the learners. As such, learners are able to link what they are learning to what they already know from their immediate environment and construct their own knowledge.

Further, learners are able to express themselves, participate in the lesson because of the familiarity of the information from their environment and this enhances their performance.

Cultural practices enhance learners' attitudes towards Experimental Techniques and Chemistry in general. Learners are motivated and develop high self-esteem because of incorporating something familiar to them in the lesson. Ethnochemistry practices provide detailed observation of natural phenomena made over a life time and making them eager to learn further. Learners are kept aware of the scientific point of view on the importance or value of cultural practices. These include the cultural ideas, believes, values and skills. Learners perfect their skills and make their life more simplified from scientific perspective. Learners appreciate the environment and how it can be conserved. The ultimate objective of Ethnochemistry is to produce a person guided by wisdom and serve as a buffer against all trials.

VI. RECOMMENDATIONS

Based on the study findings, the researcher recommends that:

I. Teachers' Training Colleges and Universities in Zambia should enhance orientations of students on the Ethnochemistry Teaching Approach.
II. Teachers in Zambia should be encouraged to adopt Ethnochemistry Teaching Approach in Chemistry instructions. This can be done through Continuous Professional Development (CPD) and end of year Subject Association Seminars.
III. There is need to document various Ethnochemistry practices in Zambia. This will help teachers and other scholars to easily access the information.

VII. LIMITATIONS OF THE STUDY

The study had the following limitations:

I. Five learners were not consistent in the study and stopped coming to school before the closing day. Hence, it was difficult to get the questionnaires that were given to them. This resulted in reduction of the sample size from 200 to 195 study participants.
II. The study was only done in one district of Zambia.

VIII. RECOMMENDATIONS FOR FURTHER RESEARCH

- More Ethnochemistry practices should be uncovered and documented for easy incorporation into the curriculum.

ACKNOWLEDGEMENT

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Some Cultural Practices Used In This Study

S/N	SCIENTIFIC NAME	LOCAL NAME	PREPARATION AND USES
01	Cassia abbreviata	Umunsokansoka	The leaves and the fruits are crushed and soaked in water. Later, the mixture is filtered. The filtrate is used to treat Malaria.
02		Umono	The seeds are roasted and later pounded. The pounded seeds are soaked in Luke-warm water. After few minutes it is filtered to get the oils. The oils are used as lotion.
03	Ethanol	Kachasu	Starch food is used to prepare Kachasu with the addition of sprouted millet.
04	Tephrosia Vogelli	Ububa	The leaves are pounded and soaked in water. The water is prayed on maize plant to kill armyworms.
05	Aloe Vera	Tembusha	The thorns are removed and later the leaves are separated and crushed with the hands. Then it is used as bathing soap.
06		Munkoyo drink	Preparation of Munkoyo drink and filtration process
07	Winnowing	Separation of maize grains or beans from Husks	Separation of maize grains or beans from Husks