

ETHNO PEDAGOGICAL APPROACH IN TEACHING CHEMISTRY AT GRADUATE LEVEL: A SURVEY

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Abstract

Ethno pedagogy is a branch of scientific pedagogy. As a field of science it studies the long life experience of our ancestors. Chemistry enables the students to understand what happens in the world they live and how it contributes to the quality of life. Ethno pedagogy approach in teaching chemistry helps very much to study chemistry as a subject of high practical significance in a culturally responsive way. The present study gives a collective extract of a Survey conducted on ethnopedagogic approaches in education.

Key words: Ethno Chemistry, Ethno pedagogy

Introduction

Ethno pedagogy is a branch of scientific pedagogy. As a field of science it studies the life long experience of our ancestors. Experience means cultural, spiritual and experience of moral values. Ethnopedagogy is also about learning skills such as the ability to think independently, make decisions and act in social conditions. The importance and value of chemistry in social and economic sphere of any nation is immense.

Related Work

Fasasi, RasheedAdekule (2017) conducted a study on the “effects of ethno science instruction, school location and parental educational status on learners’ attitude towards science”. They employed, pretest, post test nonequivalent control group, quasi experimental design. Participants were 352 junior Secondary School Students from two schools. For knowing this, instruments used are teachers instructional guide on Ethno Science Instruction, teachers instructional guide on modified lecture method and attitude towards science scale. study revealed that Ethno science instruction group performing better than the modified lecture method group. Ethno Science instruction promoted learners attitude to science. Therefore its use in educational instruction, especially among traditional science learners should be explored.

OkwaraKaluOkward, Francis Terseerupu (2017) studies the “effects of ethno science instructional approach on students achievement and interest in upper basic science and technology”. Quasi experimental design and control group design was adopted. Two validated tools were administered to a sample of 485 students. The Students were taught by using ESIA (Ethno Science instructional approach) and their counter parts using demonstration teaching method. Conclusion was that ESIA enhances students achievement and interest.

Oulwatosin Victor Ajay, EmmanuelEdojaAchor and peter ogbuagogu investigated the “Effect of ethno chemistry teaching approach on achievement and retention of Senior Secondary students in Standard mixture separation techniques”. The sample consists of 198 students from ohaozara local government area of Ebonyi state.

The study adopted non equivalent quasi experimental research design. The study revealed that students taught mixture separation technique using ethno chemistry approach had significantly higher mean achievement score than those taught using discussion method. It was recommended that chemistry teachers trainee should be trained on the use of ethno chemistry approach and serving teachers should be encouraged to use ethno chemistry.

Victor Oluwatoson Ajay (2017) Examined the “effect of Hands on Activity Based method on interest of Senior Secondary Students in Organic Chemistry”. This study adopted quasi experimental design for a sample of 184 students. They taught organic chemistry for experimental group by hands on activity based method while the control group was taught using discussion method. They Validated 25 item, organic chemistry interest inventory, was the instrument used to collect data. The result indicated that students taught using hands on activity based had significantly higher mean interest score than taught using discussion method. Teachers should be encouraged to adopt hands on activity based method in teaching organic chemistry to enhance students interest in organic chemistry.

Singh, Indrasen, Chibuye, Bitwell (2016) Studies *about* “ethno chemistry practices on Secondary School Students attitude towards Chemistry”. The design of the study was pretest, post test control group, quasi experimental design. To assess the attitude towards chemistry, chemistry attitude questionnaire was used. There was a Statistically Significant difference in the post test attitude scores for control and experimental group. Therefore incorporating ethno chemistry practices in teaching chemistry was found to have a positive effect on enhancing secondary school students attitude towards chemistry

A.N Ugwu, Christian IlliemenamDiovu (2016) studies about the “influence of the integration of indigenous knowledge and practices into Chemistry teaching on student’s academic achievement”. Quasi experimental research design was adopted for thy study. A 25-item Chemistry achievement test developed from the content taught was used to collect data. Findings show that there is a change as students taught with integration of indigenous knowledge and practices had higher mean achievement score than their counter part. The study recommended that indigenous knowledge and practices be integrated into chemistry teaching for effective teaching and learning of chemistry and improved academic achievement.

Sumarni, Woro, Sudarmin, Supartono, Wiyanto (2016) proposed a design to Reveal Science Generic Skil and Chemistry Literacy in ethno Science – Integrated Chemistry learning. The tool designed was in 4 major steps, investigation phase, designing phase, construction phase, test evaluation and Revision phase. For practical testing questionnaire was used, given to 22 college students from the topic food ingredients that is integrated to ethno Science and two supporting lectures. The result of content Validity Showed that assessment tool was valid. Every lectures and 21 students gave positive response. So this design was practice to use.

NinamikhailovnaStukalenko, Sale Ashotovnamuarzina, Lisa Naviyevna navy, Shualikhanovkokshetau conducted a study on “Research of ethanopedagogical Approach in professional training of teachers”. Theoretical methods were used during this work. Questionnaire, interview, conversations etc used for collecting data. Result shows that ethno pedagogical approach to professional training of the teacher in higher education institution has to be implemented with a support on historically developed system of national education.

Emmanuel E Anchor, Benjamin I Imoko, Emmanuel S uloko, examined about the “Effect of Ethno mathematics teaching approach on senior secondary students achievement and retention in locus. Sample size is 253. It was non equivalent quasi experimental study which was guided by two research questions and hypothesis Locus achievement test was used. Results from the analysis revealed that students exposed to ETA were Superior in achievement retention than taught-with conventional approach.

Abonyiokechukwu (1998) conducted a study on the “Effect of ethno science based instructional package on student’s concept of scientific phenomena and interest in Science”. He employed non equivalent control group quasi experimental design. The sample consists of 243 students. The experimental group was taught science using the ethno science based package. While the control group was taught Science using the Conventional approaches. An interest in Science scale was used to collect data on interest in science. The result reveals that ethno science based instructional package is more effective than the conventional package in fostering interest in Science.

Rationale of the work

Research takes advantage of the knowledge which has accumulated in the past as a result of constant human endeavour. It can never be undertaken in isolation of the work that has already been done on the problems which are directly or indirectly related to a study. Review of past research develops an insight into the present study and also helps to curve the problem with precision and accuracy. Since effective research is based upon past knowledge, this step helps to eliminate the duplication of what has been done and provides useful hypothesis and helpful suggestions for a meaningful investigation.

Citing studies that show substantial agreement and those that seem to present conflicting conclusions helps to sharpen and define understanding of existing knowledge in the problem area, provides a background for the research project, and makes the researcher aware of the status of the issue. According to Best & Kahn (2010), “A familiarity with the literature in any problem area helps the student to discover what is already known, what others have attempted to find out, what methods of attack have been promising or disappointing, and what problems remain to be solved”.

The collective version of the survey on ethno pedagogical studies is given below.

Table-1

Brief description of the papers surveyed on the ethnopedagogical approaches in educational perspectives

No	Title of Study	Publisher and year	Design selected	Method &Tool used
1	Effects of ethno science instruction, school location and parental educational status on learners attitude towards science	International Journal of Science education – 2017	Pretest-post test nonequivalent control group, quasi experimental design	Teachers' instructional guide on ethno science instruction, teachers' instructional guide on modified lecture method attitude towards science scale.
2	Effects of ethno science instructional approach on students' achievement and interest in upper basic science and technology.	International Journal of Science Research in Education – 2017	Quasi experimental design and control group design	ESIA, demonstration teaching method
3	Effect of ethno chemistry teaching approach on achievement and retention of Senior Secondary students in Standard mixture separation techniques.	ICSHER Journal 2017	Nonequivalent quasi experimental design	Separation technique achievement test

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4	Effect of Hands on Activity Based method on interest of Senior Secondary Students in Organic Chemistry.	Scholarly journal of education. 2017	Quasi experimental design	Hands on activity method, Discussion method.
5	Ethno chemistry practices on Secondary School Students attitude towards Chemistry	Journal of education and practice – 2016	Pretest post test control group, quasi experimental design	Chemistry attitude questionnaire
6	Influence of the integration of indigenous knowledge and practices into Chemistry teaching on student's academic achievement.	International journal of research and reflection 2016	Quasi experimental design	Chemistry achievement test.
7	Preliminary analysis of assessment instrument design to Reveal Science Generic skill and Chemistry literacy	International journal of evaluation and Research in Education – 2016	Nonequivalent quasi experimental design	Questionnaire, lectures
8	Research of ethanopedagogical Approach in professional training of teachers	Life Science journal 2013	Theoretical research set of experimental methods, Statistical methods.	Questionnaire interview Conversations.

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9	Effect of Ethno mathematics teaching approach on senior secondary students achievement and retention in locus	Educational research and review 2009	Nonequivalent quasi experimental design	Locus achievement test
10	Effect of ethno science based instructional package on student's concept of scientific phenomena and interest in Science	Research gate 1998	Non equivalent Control group quasi experimental design	Ethno science based instruction package conventional approach

Discussion

The first study examined the effects of ethno science, school location and parental educational status on learner's attitude towards science. By using the tools teachers' instructional guide on ethno science instruction, teachers instructional guide on modified lecture method and attitude towards science scale, the study revealed that ethno science instruction group performing better than from modified lecture method group.

The second study investigated the effects of ethno science instructional approach on students achievement and achievement in upper basic science and technology. The students were taught by using Ethno instructional approach and their counter parts using demonstration teaching method. The study reveals that ESIA enhances students achievement and interest in science and technology.

The third study investigated the effect of ethno chemistry teaching approach on achievement and retention of Senior Secondary Students in standard mixture separation technique. Separation technique achievement test was used for data collection. The study proposes that chemistry teacher trainees should be trained on the use of ethno chemistry approach and serving teachers should be encouraged to use ethno chemistry.

The Fourth study examined the effect of Hands on activity based method on interest of Senior Secondary Students on Organic Chemistry. In this Study Organic Chemistry was taught for experimental group by hands on activity based method while the control group was taught by using discussion method. The study recommended that teachers should be encouraged to adopt hands on activity based method in teaching organic chemistry to enhance students interest in organic chemistry.

Fifth study was about ethno chemistry practices on secondary school student's attitude towards chemistry. Here chemistry attitude questionnaire was used results shows that there was a significant difference between control and experimental group. By incorporating ethno chemistry practices a positive effect was found on students' attitude towards chemistry.

sixth study was about the of the integration of indigenous knowledge and practices into chemistry teaching on students academic achievement. For collecting data questionnaire was used. This study recommended that indigenous knowledge and practices be integrated into chemistry teaching for effective teaching and learning of chemistry and for improved academic achievement.

Seventh study was about a design to reveal science Generic skill and chemistry literacy in ethno science Integrated chemistry learning. The tool was designed by 4 stages that is investigation phase, designing phase, construction phase, test evaluation and Revision phase. The topic food ingredients are integrated to ethno science and two supporting lectures. Students and lectures positive response to this design. Hence it is practice to use.

Eighth study was a Research on ethno pedagogical approach in professional training of teachers. For collecting data questionnaire, interview and conversations etc: are used for collecting data. Result shows that ethno pedagogical approach to professional training of the teacher in higher education institution has to be implemented with a support on historically developed system of national education

The Ninth study was about the effect of ethno mathematics teaching approach on Senior Secondary Students achievement and retention in locus. Locus achievement test was used to collect data. Result shows that students exposed to ETA were superior in achievement retention than those taught with conventional approach.

The Last Study examined the effects of ethno science instructional package on Students Concepts about Scientific phenomena and interest in Science. The experimental group was taught science using ethno science based package, the control group by conventional approach. To collect data interest in science Scale was used. The study revealed that ethnosience based instructional package is more effective than the conventional package in fostering interest in Science.

Conclusion

The survey conducted on literature review in the area of research, provided a description, summary, and critical evaluation of the works in relation to the research problem being investigated. It helped the researcher to know earlier the problems and deficiencies arised in the research flow which she could control and reduce in the present topic. *Literature review* has helped the present researcher to decide the limitations. It gave new ideas, methods and approaches to deal with research problems.

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