

Jan-March, 1(1), 2018  
Vol. 2, No. 1

# GLOBAL JOURNAL OF ACADEMIC RESEARCH (GJAR)



AFRICA \* ANTARCTICA \* ASIA \* AUSTRALIA \* EUROPE \* NORTH AMERICA \* SOUTH AMERICA

## SCHOOL VARIABLES AND FUNCTIONALITY OF CHEMISTRY EDUCATION IN UYO LOCAL GOVERNMENT AREA OF AKWA IBOM STATE

<sup>1</sup>Theresa M. Udofia, <sup>2</sup>Anyanime O. Akpan and <sup>3</sup>Sunday S. Jacob

<sup>1</sup>Dept. of Science Education, University of Uyo, Uyo

<sup>2</sup>.Dept. of Science Education, Akwa Ibom State University, Ikot Akpaden.

<sup>3</sup>Dept. of Educational Foundations, Guidance and Counseling, University of Uyo, Uyo.

### Abstract

This study examined school variables and functionality of chemistry education in Uyo Local Government Area of Akwa Ibom State. Four research questions and four hypotheses guided the study. Ex-post facto design was used. The population consisted of all the 11, 217 Senior Secondary II (SS2) students in the 14 public secondary schools in Uyo Local Government of Akwa Ibom State. A simple random sampling technique was used to select the sample size of 350 students. One researchers' developed instrument tagged "School Variables and Functionality of Chemistry Education Questionnaire (SVFCEQ)" was used to collect data. The reliability of the instrument was established at 0.81 using Cronbach Alpha. Research questions and null hypotheses were answered and tested using mean, standard deviation and t-test. Results showed that school variables - use of library, use of ICT, students friendly environment and resources for extra-curricular activities significantly influence the functionality of chemistry education in Uyo Local Government Area of Akwa Ibom State. Based on the findings, it is recommended that government should adequately fund secondary school education by providing functional library, well-ventilated classrooms, computers and other ICT softwares as well as resources for extracurricular activities for secondary school education and chemistry education in particular to achieve its aim of equipping students with knowledge, skills and attitude.

*Keywords:* School variable, Functionality, Chemistry Education, Influence, Akwa Ibom State

### Introduction

School is a social institution that brings about positive change in knowledge and attitude for national development. The success of any nation in tackling major developmental problems such as poverty, unemployment, inequality, youth restiveness among others can be traced to the functionality of the school system especially at the secondary school level. The secondary school chemistry curriculum in Nigeria aims at ensuring that every secondary school graduate acquire knowledge, attitude and skills through relevant functional science, technical and vocational education that would prepare them for higher education, as well as provide job-specific skills for self reliance. Schools, particularly, secondary therefore must be established and equipped with necessary facilities for the



purpose of imparting knowledge, skills and attitude for students to become more effective member of the society ( Udofia, 2017). These can only be achieved when the environment of the school system is functional with adequate and relevant facilities like well equipped library, functional ICT department, conducive and students' friendly classroom environment as well as resources for extracurricular activities. This indeed will transcend into meaningful teaching and learning that build effective human capital that breeds technological innovation and economic growth.

School variables, according to Joseph (2014) is the school physical surrounding which includes the classroom, school location, libraries, technology workshop and play ground. It also refers to school facilities such as equipment and materials used in facilitating the teaching learning process. These facilities include seats, tables, chalkboard, lighting, charts, maps, and ICT facilities e.g computer and internet. It is believed that a well planned school with these variables will facilitate effective teaching and learning process as well as good social, political and economic emancipation.

In Nigeria, secondary school chemistry education aims at equipping students with practical skills, positive attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. As noted by Udofia (2017) chemistry education is a socially and intellectual transforming process that provides knowledge, skills and values to students for human and societal development. This invariably prepares chemistry students for useful living within the society; provides students with the opportunity for further education with the aim of providing trained manpower in applied science and technology. According to (FME, 2009) secondary school chemistry curriculum is to ensure that every secondary education graduate has a functional education, well prepared for higher education, as well as acquire relevant functional technical and vocational job-specific skills for wealth generation and self reliance.

The learning experiences acquired in any functional school environment serve as the bridge to overcome life's circumstances and eventually become a more effective member of the society. Ochuba (2008) reported that there has been a public outcry on the continual decline in the standards of education in Nigeria as indicated in public examinations. The implementation of a functional secondary school chemistry curriculum is very important. This is because at this stage students acquire basic theoretical and practical knowledge and skills i.e developing students' interest in the subject of chemistry as well as adequately preparing students for further studies in chemistry. Thus, the precise predictions of learning outcomes in education could be said to anchor on functionality of school variables like quality teaching and learning, effective use of library, use of ICT, adequate and conducive classrooms and resources for extra-curricular activities. With this in view, there is need to find out the influence of secondary school variables in terms of use of library, use of ICT, conducive classrooms and resources for extra-curricular activities on functionality of chemistry education in Akwa Ibom State.

### **The Concept of Functionality**

The word functionality literally means being in good working condition, useful, serving a purpose or fulfilling a function it is intended for. It also refers to the workability or being of quality, very suitable for the purpose it was designed for (Oxford Thesaurus Dictionary (2006). According to Akpan and Benjamin (2017) functionality in secondary education refers to the extent to which education resources are available for the implementation of the school curriculum. In this study functionality means quality, adequate, workable or practicable secondary school chemistry education which encompasses functional library with relevant and up to-date books and media; conducive learning environment, adequate ICT resources. It also include availability of relevant extracurricular resources for indoor and outdoor sport activities

### **School library and students' learning**

School library plays a significant role in supporting and enhancing deep learning and reflective thinking. Reflective thinking according to Nagel (2005) is ability to think back to what has occurred in the past and consider how to apply the knowledge on the present or future situation. A functional school library is a standard library which offers a wide range of learning materials that can help students to think, reflect and learn with understanding. It is a place that could provide answers to some curious questions, motivate and enhance positive mind-set towards learning. Adesoji and Olatunbosun (2008) posited that school library promote life-long reading and learning for various purposes. The library serves as the nerve centre of all educational activities in institutions and provides a quiet, well-lit study environment that is favorable for mental concentration. That is why the Federal Republic of Nigeria in its National Policy on Education (2013) recommended the provision of functional school libraries stocked with appropriate media resources to promote sound and effective teaching and learning activities, motivate and boost students reading habits for enhanced academic achievement. The minimum standard according to the policy should consist of books, pamphlets, paper cutting, gazettes and government publications, atlas, maps/charts, photography records, film, record players, cassette tapes, film projectors, slides, relia, periodicals as well as reference books, non-fiction and fictions. According to Owate and Okpa (2013) learning resources for school libraries are divided into mainly print and non-print media. Print media include books, periodicals, newspaper, pamphlets, brochure, handbills and ephemerals. The non-print materials comprise photograph, slides, audiotapes, film strips, motion films, video tapes, computers and relia. However, books constitute the bulk of print materials in the secondary school libraries.

Dike (2004) while trying to create awareness about the importance of library in secondary education in Nigeria, opined that the modern school library stands at the very centre of educational programme of the school. It is often referred to as the "heart" of the school or as the "laboratory" of laboratories because education of the 21<sup>st</sup> century is resource based. The resources for teaching and learning are to be found in the school resource centre or the school library. The central mission of school library therefore is supplying the instructional materials and furthering the teaching and learning programme of schools. Aina and Adekenye (2013) observed that availability of library resources were responsible for improved academic performance of students in their chosen school subjects. A functional school library is synonymous to success in any teaching and learning programme.

### **Environment/Classrooms climate**

The classroom is a critical factor in a teaching learning process. It is a significant personal and social environment in the lives of students which needs to be students friendly. This is to ensure every child an environment that is physically safe, emotionally secured and psychologically balanced for learning to take place. Evidence from research finding has shown that the nature of a classroom environment has a powerful influence on how well students achieve a wider range of educational outcomes (Oluremi, 2013). It has however been observed that most of the classrooms in Nigeria are still functioning below standard.

A friendly classroom implies the provision of adequate classroom accommodation with teacher-student ratio of 1:40 and 1:20 in the case of practical work (FGN, 2013). It also implies a well light ventilated, calm and clean and secured with normal temperature that would enhance teaching and learning processes. A conducive learning environment does not only make learning simple to understand but interesting, fun, meaningful and functional. This demands provision of classrooms with adequate audio and visual materials like media, pictures, photographs, charts and models are as well as teaching/learning devices that appeal to auditory senses examples include radio, audiotape, telephone and mobile phones. Reporting on the deficiencies in Nigerian schools, Olaleye (2011) said that 12% of pupils sit on the floor, 87% have over-crowded classrooms, 3% of the classrooms have no chalkboard, 38% of the classrooms have no ceiling, 77% of the pupils lack textbooks, 36% of the pupils have no writing materials. He went further to say that the unfriendliness of the classroom environment is induced by inadequate classroom space, furniture, equipment for teaching and learning including poorly motivated teachers, use of sub-standard teaching methods. Any classroom characterized by these factors would not provide functional education for the students. No meaningful learning takes place in an overcrowded classroom and that is why (Nakpodia, 2011) said that the provision of classroom blocks plays a major role in the achievement of the set education goals.

### **Extracurricular Activities**

The school is a social institution and the adaptability to the school setting and academic activities is the extent to which students are able to combine academic with social events like participating in extracurricular activities. Extracurricular activities provide a channel for fulfilling the saying that all work and no play make Jack a dull boy. According to Agbajari, (2014) extracurricular activities are unpaid activities not pertaining to normal school classes within or out of school. It could be considered as any educationally purposeful activity a student participates in or outside the classroom at a controlled rate to help students understand diverse attitude and acquire academic skills. It is associated with school sports like football, table tennis, basket ball or lawn tennis or school clubs such as science club, literary, library and debating clubs and health club among others. These clubs usually meet after school hours to encourage members to acquire skills that could be applied to academic work.

Miller (2005) submitted that sport activities not only leave a positive mood but also increase mental alertness and create positive school culture. Okon (2017) reported that sport and clubs activities significantly influence academic behavior of students. In contrast Lei (2007) found a significant negative correlation between students' involvement in social activities and overall academic achievement. Therefore, this study is to examine the influence of extracurricular activities on the functionality of chemistry education in Uyo Local Government Area of Akwa Ibom State

### **Use of ICT in Secondary Schools**

The use of Information Communication Technology (ICT) resources and services is rapidly expanding scientific knowledge. ICT has changed the way people think and learn and has helped activities to run smoothly in schools towards achieving educational objectives. These resources include computers, digital cameras, multimedia software applications, internet, television and videos which afford services of exchange of information and knowledge, skills and ideas. ICT resources come in many forms and are applied in a variety of ways such as in computational analysis, creation of data bank, storage and management of educational data, communication via internet, instructional materials and access to information (Bailey, 2013).

In recognition of the prominent role of ICT in advancing knowledge and skills necessary for effective functioning in knowledge based world, the Nigerian Policy on Education (FRN, 2013) support the integration of ICT in teaching /learning process for the benefit of students. It offers interactive activities with which students can learn meaningfully. Thomas, Babatope and Jonathan (2013) observed that ICT facilities are mostly used for research and administrative purposes in Nigerian educational institutions than for teaching and learning. Most science teachers are not even aware of the different types of ICT tools that are available for lesson instruction as the institutions where these science teachers graduated from do not have these facilities. Huk (2013) remarked that ICT can improve learning and sustain interest even though most teachers were not familiar with ICT tools and devices that simplify instructions and as such could not practice independently.

### **Statement of the problem**

The rate graduates from institutions of learning especially those from secondary schools roam the streets and getting involved in social vices like stealing, cultism among others makes one to wonder about the functionality of education in Nigeria. In any formal school setting, school variables like use of library, use of ICT, student friendly environment and resources for extra-curricular activities play a significant role in meaningful teaching and learning. A number of factors have been identified to be responsible for the increasing rate of unemployment and increased rate in social vices. Among such factors are inadequate facilities for learning and poor teaching method adopted by teachers. The question begging for answer is does secondary school system in Akwa Ibom State have the necessary facilities to make chemistry education functional so as to equip students with the necessary knowledge, attitude and skills it was intended for? It is against this background that this study investigated the influence of school variables and functionality of chemistry education in Akwa Ibom State.



### Research questions

1. What is the influence of the use of library on the functionality of chemistry education in Akwa Ibom State?
2. What is the influence of the use of ICT on the functionality of chemistry education in Akwa Ibom State?
3. What is the influence of student friendly classrooms on the functionality chemistry education in Akwa Ibom State?
4. What is the influence of extracurricular activities on the functionality of chemistry education in Akwa Ibom State?

### Hypotheses

1. There is no significant influence of the use of library on the functionality of chemistry education in Akwa Ibom State.
2. There is no significant influence of the use of ICT on functionality of chemistry education in Akwa Ibom State.
3. There is no significant influence of student friendly classrooms on the functionality of chemistry education in Akwa Ibom State
4. There is no significant influence of extracurricular activities on the functionality of chemistry education in Akwa Ibom State.

### Methodology

The research design used for the study was survey ex-post facto research design. This design was considered suitable for the study because the variables (school variables- school library, availability of ICT, conducive classrooms and resources for extracurricular activities) under investigation were assumed to have occurred and cannot be experimentally manipulated in the process of the study. The population of the study consisted of all the 11, 217 Senior secondary two (S.S.2) students in the 14 public secondary schools in Uyo Local Government Area of Akwa Ibom State. Simple random sampling technique was used to pick 25 students from each of the schools using hat and draw method resulting in sample size of 350 students.

A researchers-developed instrument titled 'School variables and functionality of chemistry education Questionnaire (SVFCEQ) was used for data collection. The instrument had two sections, A and B. Section A sought information on demographic data of the respondents while section B contained 40 items on school variables like well equipped library, functional ICT department, students friendly classroom/environment as well as resources for extracurricular activities with a 4- point rating scale as follows: strongly Agree (SA<sub>4</sub>)= 4 Agree (A)= 3, Disagree (D)=2 and strongly Disagree (SD)= 1.

The instrument was face validated by three validates. One from Department of Science Education and two from the Department of Curriculum Studies, Management and Planning all in University of Uyo, who independently assessed the various items in the instruments to ascertain their relevance to the variables under study. The Internal Consistency method was used for determining the reliability coefficient of the instrument. This was done by administering the instrument to 30 students' who were selected from the population of the study but were not included in the study sample, the scores obtained from the respondents were analyzed using Cronbach Alpha Analysis. A reliability coefficient of 0.81 was obtained for the instrument.

The instrument was administered by the researchers to the students. The respondents were encouraged to co-operate with the researchers as all the information gathered would serve only the purpose of the research. Explanations were made by the researchers to the respondents as the need arose. A total of 350 copies of the instrument were administered and returned.

The data obtained were analysed using t-test statistics. The entire hypotheses formulated were tested at 0.05 level of significance.

## Results

**Table 1:** Dependent t-test analysis of influence of the use of library on functionality of chemistry education (N= 350)

Variables	Mean	SD	t-cal	t-crit
Use of library	15.23	2.09	29.04*	1.97
Functionality of chemistry education	29.71	4.93		

\*Significant at .05 level, df = 348

The result in Table 1 indicates that the calculated t-value of 29.04 is greater than the critical t-value of 1.97 at .05 level of significance and 348 degrees of freedom. With this result the null hypothesis that claimed a no significant influence of the use of library on functionality of chemistry education was rejected. Deduction from this analysis is that there is significant influence of the use of library on functionality of chemistry education in Uyo Local Government of Akwa Ibom State.

**Table 2:** Dependent t-test analysis of the influence of the use of ICT on functionality of chemistry education (N= 350)

Variables	Mean	SD	t-cal	t-crit
Use of ICT	14.72	2.46	27.70*	1.97
Functionality of chemistry education	29.71	4.93		

\*Significant at .05 level, df = 348

The result as shown in Table 2 indicates that the calculated t-value of 27.70 is greater than the critical t-value of 1.97 at .05 level of significance and 348 degrees of freedom. With this result the null hypothesis that says there is no significant influence of availability of ICT on functionality of chemistry education was rejected. This implies that the use of ICT significantly influence the functionality of chemistry education in Uyo Local Government of Akwa Ibom State.



**Table 3:** Dependent t-test analysis of the influence of student friendly classrooms on functionality of chemistry education (N= 350)

Variables	Mean	SD	t-cal	t-crit
Student friendly classrooms	17.25	2.39	26.97	1.97
Functionality chemistry education	29.71	4.93		

Significant at .05 level, df = 348

The analysis in Table 3 reveals that the calculated t-value of 26.97 is greater than the critical t-value of 1.97 at .05 level of significance and 348 degrees of freedom. With this result the null hypothesis that says there is no significant influence of student friendly classrooms on functionality of chemistry education was rejected. This implies that there is significant influence of student friendly classrooms on functionality chemistry education in Uyo Local Government of Akwa Ibom State.

**Table 4:**

Dependent t-test analysis of the influence of resources for extracurricular activities on functionality of chemistry education (N= 350)

Variables	Mean	SD	t-cal	t-crit
Resources for extracurricular activities	13.72	1.42	25.85*	1.97
Functionality of chemistry education	29.71	4.93		

\*Significant at .05 level, df = 348

From Table 4, the finding for hypothesis four indicates that the calculated t-value of 25.85 is greater than the critical t-value of 1.97 with 348 degree of freedom at .05 level of significant. With this result the null hypothesis which stated that there is no significant influence of resources for extracurricular activities on functionality of chemistry education was rejected. Deduction from this finding is that there is significant influence of resources for extracurricular activities on functionality of chemistry in Uyo Local Government of Akwa Ibom State education.

### Discussion of Findings

The result from Table 1 revealed that the use of library has significant positive influence on functionality of chemistry education. This finding is possible in view of the fact that when there are adequate and relevant materials in the library, the students will be motivated to visit the library to read which invariably will lead to enhanced academic performance of students. This finding supports the observation of Todd and Gordon (2010) who observed that good quality library help students read more, learn how to use and process information better and perform better on achievement tests. Also, the finding also supports Olajojo's (2010) observation that school library media centre is vital to the success of any teaching and learning programme. The findings further supports Aina and Adekenye's (2013) finding that use of library resources were responsible for improved academic performance of students in their chosen school subjects.

The result on testing of null hypothesis two in Table 2 showed that there is a significant influence of the use of ICT on functionality of chemistry education. The finding could be attributed to the fact that majority of the students spend greater percentage of their time surfing the internet and also on other electronic gadgets, hence with constant usage of ICT facilities. It is possible that the students can lay hands on materials that can enhance effective learning. This finding is in support of the assertion of Thomas, Babatope and Jonathan (2013) that ICT facilities are mostly used for research and administrative purposes in Nigerian educational institutions than for teaching and learning. Some science teachers are not even aware of the different types of ICT tools that are available for lesson instruction as the institutions where these science teachers graduated from do not have these facilities. The finding also supports Huk's (2013) finding that ICT can enhance learning though most teachers were not familiar with ICT tools and devices that simplify instructions and as such could not use it independently.

The result of the analysis in Table 3 revealed that there is a significant influence of student friendly classrooms on functionality of chemistry education in Uyo Local Government of Akwa Ibom State. This finding could be attributed to the fact that no effective teaching and learning can take place in a dilapidated classroom. This is because a well designed and functional classroom with a wide array of teaching materials provide effective instructional delivery of the school's curriculum and are positively related to student's academic performance. The findings support the assertion of Nakpodia, (2011) that the provision of classroom block plays a major role in the achievement of the set education goals. Children whose schools lacked adequate classroom materials and library services were significantly more likely to show lower test scores and higher grade repetition than those whose schools were well equipped. The findings support that of Oluremi (2013) that the nature of a classroom environment has a powerful influence on how well students achieve a wider range of educational outcomes.

The result of the analysis of the influence of resources for extracurricular activities on functionality of chemistry revealed a significant influence of resources for extracurricular activities on functionality of chemistry education. This is in support of Miller (2005) and Okon (2017) who stated that the benefits of extracurricular activities like sports and clubs in schools include a positive mood, attitude and increase mental alertness.

### **Conclusion**

School variables are significant determinant of functionality of chemistry education in public secondary schools in Akwa Ibom State. Based on the findings of the study, it was concluded that school variables do influence the functionality of chemistry education in Uyo Local Government Area of Akwa Ibom State.

## Recommendations

Based on the findings of this study, the following recommendations are made:

1. Government should adequately fund secondary education so as to provide facilities for functionality of the chemistry education in secondary schools.
2. Well ventilated classrooms and secured environment should be provided for functional chemistry education by the government.
3. Teaching/learning should be interactive and problem-based so as to provide students with functional and necessary skills for the future.
4. Government should invest in the professional development of chemistry teachers in order to update their knowledge and skills, especially in the area of ICT for functional chemistry education in secondary schools.

## References

- Adesoji, F.A. & Olatunbosun, S. 2008. Student, teachers and school environmental factors as determinants of achievement in secondary school chemistry in Oyo State Nigeria. *The Journal of International Social Research*.1.2: 13 - 34. Retrieved June 18 2012 from Uluslararası sosyal Ara-turmalar Dergisi.
- Agbajari, U. (2014). *Benefits of extracurricular activities to students*. prepclass.com.ng.
- Aina A. & Adekenye, S. (2013). Audio-visual resources availability and use for library services among colleges of education in Lagos State, Nigeria. *International Journal of Library and Information Science*, 5(10), 417-425.
- Akpan, B.E & Benjamin, R. E (2017). Resource situation and functionality of secondary education in Akwa Ibom State. *Global Journal of Academics Research (GJAR) Maiden Issue 1(1) 68-77*
- Bailey, T. (2013, August). How is technology transforming education? An Independent Supplement by Media Planet to USA Today. MEDIAPLANET Online material, 8. Retrieved April, 8, 2016.
- Dike, V. W. (2004). The role of the school library in implementing the curriculum. *The Nigerian School Library Journal*, 5(1), 21-23.
- Federal Ministry of Education. 2009. Senior secondary education revised chemistry curriculum for SS1-3. Abuja: Nigerian Educational Research and Development Council (NERDC). Abuja.
- Federal Republic of Nigeria (2013). *National policy on education and 4 years strategic plan for the development of the education sector 2011-2015*. Lagos, NERDC Press.
- Huk, T. (2013). Helping Teachers Develop Computer Animations for improving Learning in Science Education. Proceedings of Society for Information Technology and Teacher Education International Conference, 3022-3025.
- Joseph, Eme O. (2014). School variables and mathematics performance among students in Akwa Ibom State. *International Journal of Development and sustainability*, 3(7), 1558 -1568.
- Lei, B. N. (2007). Self-efficacy and student leaders: The effect of gender, previous leadership experiences and institutional environment. *Journal of the Indiana University Student Personnel Association*, 33-48



- Miller C. (2005) Emerging adulthood : A theory of development from the late teens through the twenties . *American Psychologist* 55(5) 469-480.
- Nagel, L.E.(2005). The effect of new teaching methods in chemistry on the foundation certificate learners' results. Unpublished Masters Dissertation, Port Elizabeth Technikon Promoter: E H Lombard.
- Nakpodia, E. D. (2011). Teachers' factors in the implementation of the Universal Basic Education in Junior Secondary School in the South Senatorial District of Delta State, Nigeria. *Journal of Public Administration and Policy Research*, .3(10), 286-293.
- Ochuba V.O. (2008) Improving the quality of education through effective inspection of schools: <http://www.findarticles.com>.
- Okebukola, P. (2000). The child friendly school as a new dimension in educational development in Lagos State,
- Olaleye, F. O. (2011). *Primary and secondary school schools administration in Nigeria*. Lagos: Frontline Publisher.
- Olaajo, P. O. (2010). Relevance of school library media centre on social science subject learning outcome in senior secondary schools o Oyo state, Nigeria. *Library Journals*, 9:46-48.
- Oluremi, F. O. (2013). Creating a friendly school learning environment for Nigerian children. *European Scientific Journal*. April Ed, 8(8), 125-137
- Owate, C. N. & Okpa, I. (2013). The availability and utilization of school library resources in some selected secondary schools (High school) in Rivers State. *Academic Journals*, 8(16), 1449-1460.
- Okon A.P. (2017). Involvement in social activities and academic behavior of students in University of Uyo, Uyo. Unpublished project of Institute of Education, Faculty Education. University of Uyo.
- Oxford Thesaurus Dictionary (2006). Third edition. Oxford University Press Inc. New York.
- Thomas, O. O., Babatope, K. O. & Jonathan, O. O. (2013). Teacher education, information and communication technology: prospects and challenges of e-teaching Profession in Nigeria. *American Journal of Humanities and Social Sciences* 1(2), 87-91.
- Todd, R. J. & Gordon, C. A. (2010). School libraries, now more than ever: A position of centre for International Scholarship in school libraries. [http://www.mmm.net/storage/resources/the importance of school libraries](http://www.mmm.net/storage/resources/the%20importance%20of%20school%20libraries).
- Udofia, T.M. (2017). Imperatives for successful teaching of Chemistry; Implications for societal development in the knowledge economy . *International Journal of Educational Benchmark* (IJEb), 7(2), 50-61.