EFFECT OF ACADEMIC SELF-EFFICACY AND LIBRARY UTILISATION ON UNDERGRADUATES' ACHIEVEMENT IN SCIENCES IN FEDERAL UNIVERSITIES IN SOUTHWESTERN, NIGERIA

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Abstract
This study examined the extent to which academic self-efficacy and library utilisation determined undergraduates' achievement in sciences in federal universities in Southwestern Nigeria. Total enumeration was used to cover all the 300 level students (1,029) purposively selected in science-based departments in the selected universities. Academic self-efficacy and Academic achievement of science undergraduates were found to be high while irregular utilization of library was established. Positive relationships were established among library utilization, academic self-efficacy and academic achievement of science undergraduate in federal universities in Southwestern Nigeria. Library utilization and academic self-efficacy was found to have joint significant contribution to academic achievement of the students. Since academic self-efficacy and library utilization was found to determine achievement of undergraduates in sciences in federal universities in Southwestern Nigeria, there is need, to improve on constant usage of library facilities and academic self-efficacy among science undergraduates in Nigeria.

Keywords: *Academic self-efficacy, Library utilisation, Academic achievement in sciences, Undergraduates of federal universities in Nigeria.*

Background to the study
Academic achievement of undergraduates in science-related courses in Nigerian universities has continued to be on the decline over the years; this has remained a cause of concern for all stakeholders. The reason is that science and technology is considered of great importance to the acceleration and advancement of technological development in the country. Several authors and scholars have continuously emphasised that the development of any nation depends largely on the advancement and application of science and technology (Bajah, 1985; Fariwontan, 1997 and Olorundare, 2011). Therefore, the role of science in the development of the modern society is not in dispute, as evidenced by the influence of modern technological innovations on every spheres of life. Basically, the role of science is to produce useful models of reality. Olorundare (2011) reports that if Nigeria is to build an organised, self-reliant, and technological compliant society, much emphasis has to be continually placed on science and technology in the school system. It is no doubt that science, as a discipline, has contributed tremendously to the development of the Nigerian society, and have positively influenced contemporary African society towards responding effectively to changing economic, social, and environmental trends towards achieving sustainable goals.

Academic achievement is the amount of knowledge derived from learning by students. A student gains knowledge by instructions received at school. These instructions are organised around a set of core activities and tasks that are assigned to students. Kezhia (2012) asserts that academic achievement is based on a number of factors such as student's attitude, interest, personal characteristics and social class. It can, therefore, be inferred that the concept of

academic achievement has several references that include activity and mastery, making an impact on the environment and competing against some standard of excellence. In line with this, a student is termed to have achieved academic excellence when he or she is able to measure up to the standards of educational outcomes.

However, in spite of landmark potentials of science in meeting societal needs, many students regard science as a difficult discipline to venture into. This is mostly reflected in the poor academic result usually recorded in science subjects such as: Biology (Botany and Zoology), Chemistry, Computer Science and Physics. As at present, efforts are still being made to ensure that the Nigerian science curriculum meets global standards, more so, now that national and personal developments are directly linked to education in sciences and technology. As well intentioned as these rekindled development efforts are, there is an identified, underlying and recurring problem of students' poor or low academic achievement among science undergraduates in Nigerian universities.

This trend cuts across all levels of the Nigerian educational system, the university system inclusive. Due to the likely negative consequences on national development and security, it has become a major issue of concern to all stakeholders. Ogunsaju (2004) declares that the academic standard in Nigerian educational institutions, most especially in the sciences, has fallen considerably below societal expectations. Ebenuwa-Okoh (2010) also reports that academic achievement of science undergraduates is seriously on the declining. This poor state of academic achievement in science has therefore become a source of concern. For instance, the detailed academic performance of science students in three selected universities in the Southwestern region of Nigeria between 2014 and 2016 showed a larger proportion of the graduating students in the lower grade division, with only few in the upper grade division. (See tables 1).

Table 1: Showing the level of Academic Achievement of Science Undergraduates in Three Selected Universities in Southwestern, Nigeria

S/N	Dept.	UI Session	1st Class	2ND Class Upper	2nd Class Lower to Pass	OAU Session	1st Class	2ND Class Upper	2nd Class Lower to Pass	UNILAG Session	1st Class	2ND Class Upper	2nd Class Lower to Pass
1	Botany	2010/2011	01	06	21	2010/2011	Nil	10	55	2010/2011	Nil	24	43
		2011/2012	03	07	20	2011/2012	Nil	13	65	2011/2012	03	25	48
		2012/2013	Nil	02	43	2012/2013	Nil	19	50	2012/2013	01	03	59
2	Zoology	2010/2011	03	03	23	2010/2011	Nil	10	45	2010/2011	01	22	46
		2011/2012	01	05	29	2011/2012	Nil	09	10	2011/2012	02	09	48
		2012/2013	Nil	13	29	2012/2013	Nil	16	44	2012/2013	01	03	59
3	Chemistry	2010/2011	04	09	41	2010/2011	Nil	09	23	2010/2011	Nil	06	46
		2011/2012	01	06	32	2011/2012	01	10	35	2011/2012	01	10	62
		2012/2013	01	08	55	2012/2013	01	08	64	2012/2013	03	12	51
4	Com.Sc.	2010/2011	04	23	32	2010/2011	03	26	63	2010/2011	Nil	17	38
		2011/2012	03	15	56	2011/2012	Nil	31	50	2011/2012	Nil	08	53
		2012/2013	05	21	50	2012/2013	03	31	76	2012/2013	Nil	30	55
5	Physics	2010/2011	02	08	22	2010/2011	01	14	41	2010/2011	Nil	05	22
		2011/2012	02	05	21	2011/2012	Nil	16	17	2011/2012	01	11	29
		2012/2013	03	15	34	2012/2013	03	12	28	2012/2013	Nil	04	35
	Total		33	146	508		12	234	666		13	189	694

1st Class (Hons) = 58; 2nd Class (Hons) Upper Division = 567; 2nd Class (Hons) Lower Division to Pass = 1,868.

Researcher extracts the classes of degrees of graduating students, from the 2015 Convocation Ceremonies: Order of Proceedings of University of Ibadan, Obafemi Awolowo University and University of Lagos.

The decline in academic achievement of undergraduate students in universities in Nigeria has called for serious concern, since science is key to the development of any nation. Graduates from the universities are expected to champion the course for science and technology development after school. Universities are established with the principal aim of imparting knowledge, skills and the inculcating a right attitude in the students. These are measured in terms of the gradable outcomes students' learning process. In Nigeria, students' academic achievement is measured by their performance in continuous assessment and examinations. The consequence of poor academic achievement among science undergraduate students in Nigerian universities is an increase in the rate of unemployment and the slow pace of development of science and technology. This, in turn, has affected the level of industrialisation and advancement of the Nigerian nation.

Moreover, the issue of students' poor achievement in science at the university level has become an issue of major concern to all stakeholders including parents, governments at every level, teachers, administrators, policy makers/educational experts as well as politicians and private sectors officers, due to the fear of what effect it could have on national development (Nwosu, 2004). It becomes imperative to research into factors responsible for determining, predicting or causing variance in academic achievement. Some scholars, researchers and other stakeholders have highlighted factors such as reading habit, academic self-efficacy attitude towards and use of library, availability and adequacy of library resources, among others as some of the factors that may affect the academic achievement of students. However, a thorough and continuous investigation into these factors, and others, is required.

The consequence of poor academic performance among science undergraduates in Nigerian universities may lead to their poor achievement after graduation as consistently rated by employers of labour in the Nigerian labour market. This, in turn, may invariably lead to slow-pace development and consequently affect the level of industrialisation and advancement of the Nigerian nation. Hence, it is crucial to know and understand the predisposing factors of undergraduates' science academic achievement. According to Ahmed and Bruinsma (2006), researchers have over the years, sought to find out factors that could determine students' achievement, particularly in science-based subjects. Much attention has been given to factors contributing to the academic achievement of learners, rather than their intellectual ability (Dambudzo, 2009). Academic self-efficacy is one of the factors said to be responsible for university undergraduates' poor achievement in science.

Academic self-efficacy is what an individual believes he or she can accomplish, using his or her skills under certain circumstances (Snyder and Lopez, 2007). In an attempt to increase science achievement and course-taking, Britner and Pajares (2001); Kupermintz (2002); Lau and Roeser (2002), revealed that science educators have investigated a wide range of factors that influence academic achievement and choices. One potential influence, according to them, is the confidence with which students approach science. Academic self-efficacy researchers posit that students' belief in their ability to succeed in science tasks, courses, or activities, or their science academic self-efficacy, according to (Zeldin and Pajares, 2000; Britner and Pajares, 2001), influence their choices of science-related activities, the effort they expend on those activities, the perseverance they show when encountering difficulties, and the ultimate success they experience in science.

The confidence with which students approach science makes academic self-efficacy a prime focus for science educators who want to increase students' accomplishment and engagement in science. Researchers are of the opinion that academic self-efficacy beliefs could significantly affect academic achievement and the persistence in the field of science and engineering (Ponton, Edmister, Ukeiley and seiner, 2001). Bandura (1997) defines academic self-efficacy as "beliefs in one's capabilities to organize and execute the course of action required to produce given attainments". He hypothesized that the level of academic self-efficacy can determine whether a task will be initiated, the amount of effort that will be expended on it and the level of persistence to complete the task when faced with obstacles and aversive experiences (Bandura, 1977 cited by Loo and Choy, 2013). In addition, many studies have shown that there could be a positive and significant correlation between academic self-efficacy and academic achievements, most especially in science (Jones, Paretti, Hein and Knott, 2010). These studies indicate that regardless of age, gender, domains, disciplines and countries, a student with a higher sense of academic self-efficacy will achieve better academic performance. For example, in a recent research done in the United States, Louis and Mistele (2011) reported that although there were differences in level of academic self-efficacy by gender in adolescents taking science subjects, academic self-efficacy is still found to be a good predictor of the achievement scores.

Apart from academic self-efficacy, another major factor that could possibly affect academic achievement in science is library utilization. A university library strives to play a leading role in the teaching, learning and research activities of its parent institution. It should be proactively dynamic in the provision of its services and manned by personnel of the highest quality, who possess adequate background, appropriate professional training and experience, and the proper orientation that measure up to the challenges of modern university academic. Users' expectation from any information system is to make available directly or remotely and, in real time, the needed information. Cook (2007) opines that most students who achieve success in their academics are those who are positively disposed to library and ultimately make use of library resources to complement whatever they were taught in class.

Most science students' attitude towards library utilisation in Nigeria leaves much to be desired. This may be due to the fact that they lack the necessary skills to utilise the library for academic purpose. Osinulu (2003) therefore suggests that failure of libraries to teach library users the necessary skills for library usage could amount to wasting library resources as well as efforts and financial resources put into the acquisition, processing and dissemination of information. The average Nigerian does not have a reading habit and is not exposed to the library early enough in life. This is perhaps the reason fresh students in Nigerian universities, in order to develop a positive attitude towards the library use, have to be taught how to use the library.

In order to promote the utilisation of a library and its resources, there is need for a functional library with qualified personnel and adequate resources and facilities. Such a library would encourage long-term learning habit through listening, reading and viewing. To further enhance positive attitude towards library utilisation by undergraduates, library instruction or user education should be prioritised with the view to transmitting knowledge, and skills needed for the proper exploitation and utilisation of knowledge as well as learning resources. In fact, user education is the second important role of the librarian in the development of academic institutions irrespective of level, size or specialisation, (Ekere, 1992).

According to Nawarathne (2012), it is compulsory to acquire the vast additional knowledge available to science undergraduates besides class lectures. It is required to refer to books and magazines for academic purposes. An enabling environment is provided for academics and research by the provision and referral to both print and non-print media with a lot of money

budgeted for this purpose annually. It is necessary for all science undergraduates to cultivate maximally utilise libraries. Therefore, this study investigated the effect of academic self-efficacy and library utilization on academic achievement of science undergraduates in federal universities in southwestern Nigeria.

Objectives of the study

The specific objectives of the study are to:

1. determine the level of academic self-efficacy of undergraduates in faculty of sciences in federal universities in Southwestern Nigeria;
2. establish the frequency of library use among undergraduates in faculty of sciences in federal universities in Southwestern Nigeria;
3. find out the relationship between academic self-efficacy and academic achievement of undergraduates in faculty of sciences in federal universities in Southwestern Nigeria;
4. find out the relationship between library utilisation and academic achievement of undergraduates in faculty of sciences in federal universities in Southwestern Nigeria;
5. find out the joint contribution of academic self-efficacy and library utilization to academic achievement of undergraduates in faculty of sciences in federal universities in Southwestern, Nigeria; and
6. establish the relative contributions of academic self-efficacy and library utilization to academic achievement of undergraduates in faculty of sciences in federal universities in Southwestern, Nigeria;

Research questions

The following questions were answered in this study:

1. What is the level of academic self-efficacy of undergraduates in faculty of sciences in federal universities in Southwestern, Nigeria?
2. What is the frequency of library use among undergraduates in faculty of sciences in federal universities in Southwestern, Nigeria?
3. What type of relationship exists between academic self-efficacy and academic achievement of undergraduates in faculty of sciences in federal universities in Southwestern, Nigeria?
4. What type of relationship exists between library utilisation and academic achievement of undergraduates in faculty of sciences in federal universities in Southwestern, Nigeria?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

H_{01}: There is no significant joint contribution of academic self-efficacy and library utilisation to academic achievement of undergraduates in faculty of sciences in federal universities in Southwestern Nigeria.

H_{02}: There is no significant relative contribution of independent academic self-efficacy and library utilisation to academic achievement of undergraduates in faculty of sciences in federal universities in Southwestern Nigeria.

Literature Review

Belief in one's ability to perform a specific task is referred to as academic self-efficacy. Bandura, (1997) defines academic self-efficacy as "beliefs in one's capabilities to organise and execute the course of action required to produce given attainments and further hypothesises that the level of academic self-efficacy can determine whether a task will be initiated, the amount of effort that will be expended on it and the level of persistence to complete the task when faced with

obstacles and aversive experiences. Thus, academic self-efficacy is defined as a judgement about one's ability to organise and execute the courses of action necessary to attain a specific goal. Academic self-efficacy judgements are related to specific tasks in a given domain (Bandura, 1997; Pajares, 2005; Zimmerman, 2000) and considered as goal-directed activity.

Science undergraduates' academic self-efficacy, for example, could be assessed by the following questions, "How confident are you that you can pass science courses at the end of this term?" and how confident are you that you can get a grade better than a B in science courses?" (Bong and Skaalvic, 2003). Furthermore, academic self-efficacy is domain specific; it is not a generalised trait within an individual. In science, students who have strong belief that they can succeed in science tasks and activities will be more likely to complete them successfully, persevere in the face of difficulties, and be guided by physiological indexes that promote confidence as they meet obstacles. On the other hand, students who do not believe that they can succeed in science-related activities will avoid them, if they can, and will put in minimal effort, if they cannot. When confronted with the typical challenges that science involves, they will be more likely to give up, having experienced the stresses and anxieties that the erosion of their efforts.

That notwithstanding, previous research has established that science academic self-efficacy is associated with science achievement and science-related choices across grade levels. At the college level, science academic self-efficacy predicts achievement (Andrew, 1998) and persistence in science-related majors and career choices (Gwilliam and Betz, 2001; Lent, Brown, and Larkin, 1984; Luzzo, Hasper, Albert, Bibby and Martinelli, 1999). In high school students, science academic self-efficacy correlates with science achievement and is a better predictor of achievement and engagement with science-related activities in and out of the classroom than gender, ethnicity, and parental background (Kupermintz, 2002; Lau and Roeser, 2002). Among middle school students, science academic self-efficacy predicts science achievement, with girls and white students having higher science grades and stronger academic self-efficacy than do boys or African American students (Britner and Pajares, 2001: Pajares, Britner, and Valiante, 2000).

In fact, individuals with high academic self-efficacy enrol in more challenging courses than do individuals with low academic self-efficacy (Watt, 2006) because they perceive tedious tasks as challenges, rather than threats. Highlighting the importance of perceptions of abilities rather than actual abilities for influencing motivation, research has shown that interest is more highly related to academic self-efficacy than actual ability (Bandura, 1991). This finding helps explain why many girls and young women lose interest in science, even though they do not lack science abilities. What they lack is the belief that they are capable of attaining science goals-such as certain grades, majors, or professions-which leads to decreased interest in pursuing science (Eccles, 1994). Science academic self-efficacy predicts academic performance beyond one's ability or previous achievement because confident individuals are motivated to succeed. Students with high science academic self-efficacy set more challenging goals and work harder towards accomplishing those goals than students with low science academic self-efficacy.

In addition, high academic self-efficacy is associated with greater academic self-regulation, including more efficient use of problem-solving strategies and management of working time (Zimmerman, 2000). Towards expending greater effort, efficacious individuals persist longer to complete a task, particularly in the face of obstacles and adversity (Zimmerman, 2000; Pajares, 2005). Therefore, on the average, science academic self-efficacy may be related to science task achievement. For example, science academic self-efficacy is related to students' grades in science class (Britner and Pajares, 2006). The relationship between academic self-

efficacy and performance is reciprocal and on-going, whereby successful task performance boosts academic self-efficacy, leading to the adoption of more difficult goals which require greater effort. This would positively affect performance/achievement. Successful performance with new but more difficult goal will, in turn, lead to even greater academic self-efficacy and thus, the circle continues (Bandura, 1997).

However, because of the reciprocal academic self-efficacy-achievement relationship, it is important that beliefs about one's capabilities are accurate (Bandura, 1997; Pintrich, 2003). Being overconfident or otherwise can undermine achievement: Let us assume two students have comparable mathematics ability, but very different perceptions of their math's abilities; (one has relatively high math's academic self-efficacy and the other has relatively low math's academic self-efficacy). The student with high academic self-efficacy set a high goal grade for the upcoming examination to the extent that he/she overestimates his or her ability to solve algebra problems. He or she is likely to put in less effort at studying than is necessary and will likely not earn his or her goal grade. In addition, if the student is overconfident, he or she might disregard the negative exam results in other to preserve her unrealistically high self-efficacy (Pintrich, 2003; Vancouver and Kendall, 2006). The student with low academic self-efficacy, on the other hand, sets a low goal grade. Discouraged by his or her perceived lack of skill in algebra, he or she studies only enough to get the grade he or she believes is capable of earning and may get a grade far below what she could have earned. Furthermore, mediocre exam grade may affect his or her subsequent math academic self-efficacy and make her less likely to pursue more advanced math courses, despite having the capability to solve algebra problems and succeed in more advanced math courses (Eccles; Pajares, 2005).

According to Bandura, (1992) as cited by (Kitching, Cassidy, Eachus and Hogg, 2011), academic efficacy beliefs vary in strength. Weak academic efficacy beliefs are easily negated by experiences in which a person fails to do well, whereas people who strongly believe in their capabilities persevere in their efforts, even if they encounter challenges. The process of academic self-efficacy can thus be seen as a positive or negative feedback mechanism. If person believes he or she is capable of executing the behaviour necessary to perform a task, he or she will persevere longer and is more likely to succeed because of this perseverance. The reverse could also be the case. For this (and other) reasons, higher levels of perceived academic self-efficacy tend to be accompanied by higher performance attainments. Nonetheless, academic self-efficacy research is well established within the educational sector and a wealth of research findings indicate that academic self-efficacy correlates with achievement outcomes (Bandura, 1997; Pajares and Kranzler 1995; and Schunk 1995, as cited by Kitching, et al, 2011). Students with high levels of academic self-efficacy are more likely to challenge themselves and be more motivated to succeed when faced with potential failure. The opposite is true of students who have low academic self-efficacy; when they fail at tasks, they find it more difficult to summon the courage to overcome their challenges.

Similarly, researchers have investigated and continue to explore the relationship between beliefs and variety of academic performances/achievement and the relationship among the beliefs themselves (Pajares and Urdan, 1996). Generally, results have supported the thoughts of the social cognitive theory with regards to academic self-efficacy (Multon, Brown and Lent, 2001), yet they have remained unsuccessful in explaining the relationship within and among academic self-efficacy beliefs and other expectancy constructs. Differentiating between the practical and the empirical has also posed unmet challenges for researchers. Assessing academic self-efficacy beliefs is commonly done by asking individuals to share the level, generality, and strength of confidence they feel in completing a task successfully, given a particular situation (Pajares and Urdan, 1996; Schunk, 1996).

Findings have also shown that when students believe they are capable of successfully completing an academic task, they persist much longer than those who do not (Pintrich and Garcia, 2001). Pintrich and De Groot (2000) report that "students needed to have both the 'will' and the 'skill' to be successful in the classroom". Likewise, when the efficacy assessment is closely tied to the specifically measured task, prediction power is greatly enhanced (Pajares, 1996). Generally, most researchers believe that academic self-efficacy is a powerful motivational tool which works well with aiding and predicting academic self-efficacy and works to its fullest potential when theoretical recommendations are practical and adhered to. Bandura (1997) indicates that academic self-efficacy is context-specific. Therefore, prediction of academic outcomes is enhanced by directly corresponding specificity.

However, this makes academic self-efficacy a prime focus for science educators who want to increase students' accomplishment and engagement in science. Researchers have found that academic self-efficacy beliefs could significantly affect academic achievement and the persistence in the field of science and engineering (Ponton, Edmister, Ukeiley and Seiner, 2001). In addition, in the academic setting, many studies have shown that there is a positive and significant correlation between academic self-efficacy and academic achievements, most especially in science (Jones, Paretti, Hein and Knott, 2010).

In addition, these studies have shown that regardless of age, gender, domains, disciplines and countries, a student with a higher sense of academic self-efficacy will achieve better academic achievement/performance. For example, in a recent research conducted in the United States, Louis and Mistele (2011) avow that although there were differences in level of academic self-efficacy by gender in young adolescents taking science, academic self-efficacy is still found to be a good predictor of the achievement scores. Congruent with the Western studies, in the context of Singapore junior college, Amil (2000), in a study investigating academic self-efficacy and academic self-regulated abilities of students taking Economics at "A" level, found that there was a significant, positive correlation between academic self-efficacy and academic achievement, and between academic self-efficacy and academic self-regulated learning.

There is also evidence that students' performance in academically threatening situations depends more on efficacy beliefs than on anxiety arousal. Siegel, Galassi, and Ware (1985) substantiate that academic self-efficacy beliefs are more predictive of maths performance than is maths anxiety which could equally be applied to how effective students could successfully use library information resources to achieve positive output or outcome. The strength of academic efficacy beliefs accounted for more than 13% of the variance in their final maths grades, whereas maths anxiety or library use anxiety did not prove to be a significant predictor. These studies provide clear evidences of the discriminant and predictive validity of academic self-efficacy measures, and they suggest particular benefit, if educators focus on fostering a positive sense of personal academic efficacy, rather than merely diminishing scholastic anxiety.

Also, in a study done by Ahmed and Bruinsma (2006) on a sample of 181 Asian and European graduate students, they found that academic self-efficacy has a significant influence on academic achievement/performance of students. The results from this study confirm that the more a student feels positive about his or her ability, the higher his or her achievement would be. According to Li (2012), there is a positive relationship between academic self-efficacy and academic achievement. It was found that when a student possessed high academic self-efficacy, he/she was more likely to indicate an increase in knowledge and confidence in dealing with the subject. However, a study by Coetzee (2011) reveals an inconsistent result as it establishes that the relationship between academic self-efficacy and academic achievement of

undergraduate students may vary based on their level of study. According to Coetzee, sometimes a relationship exists between academic self-concept/self-efficacy and academic achievement, as was the case with second and third year students in his study. Other times, there was not any or only a weak relationship between these two constructs, as in the cases of the first and fourth year students. With the second and third year students, a positive correlation was found between academic self-efficacy or self-concept and academic achievement.

To crown it up, besides the factors discussed above that could probably determine university undergraduates' achievement in science is the level of science students' utilisation of the library. It is necessary for all the science undergraduates to develop a healthy reading culture and utilise the library. Nwezeh (2010) discloses that the effectiveness of the use of library as an instrument of education is determined by the success with which it is able to provide the user with the information he/she seeks. The philosophy of librarianship is based on the concept of service and the provision of relevant materials for users. Librarians have information dissemination as their predominant function. To this end professional librarians continue to struggle to collect and organise print and other forms of knowledge recorded in order to satisfy both present and future users. The library can fulfill its function best by pursuing a policy of constant self-evaluation in order to be alert to the changing needs of its users. Self-evaluation of assessment of any library can produce worthwhile results. Fundamentally, it can provide information which will assist the library administrators in their planning.

This attempt by the library management, which includes introduction of user education, is to build good library culture into the students right from the foundation of their university education (Akande, 2000). The need to define the pattern of use of the library and its materials as demonstrated by undergraduates, especially the freshmen, is very significant because it would enable the librarians see the library as the students see it. Academic use of library studies has evolved over the years. Various user researchers have probed user attitudes as well as the characteristics of use, reasons for library visits, and factors related to the use of different types of library materials. A number of statistical studies point to various characteristics of the library habit of students.

In line with this, Whitmire (2002), for example, examines the relation between library resources, services and science students' educational outcomes through multiple regression analysis, utilising the data collected by the College Student Experience Questionnaire (CSEQ) and the National Centre for Education Statistics (NCES). Two assumptions underlie her study: "(i) undergraduates attending institutions with large amounts of academic library resources and services would participate in more academic library activities and also report greater gains in critical thinking".

Toda and Nagata (2007) conducted a paper survey in 2003 mailed to the former students of Bunkyo University Koshigaya campus (number of respondents: 340; return rate: 33.7%). The focus was on the relations between their library usage and learning outcomes while they were students. Thereby, it was affirmed that "use of library," "benefits of use of library" and "learning outcomes" are related and that the library contributes to this relationship. In other words, the grounds for the assessment of academic library usage in its contribution to students' learning outcomes are prepared. The results obtained from this study put the research a step forward from that of Whitmire (2002). Nonetheless, as could be surmised from the study by Toda and Nagata (2007), there is no uniformity in students' use of the library. The study also showed that the "benefits of use of library" and "learning outcomes" attained are somehow related to the ways in which students use the library. Focusing on this point, the current study

attempts to understand students' use of academic libraries and clarify what educational outcomes are achieved in relation to their patterns of use of library. Students' expectations and demands of the library are reflected in their library use, and if these are related to certain educational outcomes, the results of this study may be useful to promote certain types of use of the library that are more efficient in attaining desired outcomes. Also, if it is possible to predict the level of outcomes affected by the identified types of uses of the library, this process can be examined further to develop into a method of outcomes assessment (Toda and Nagata, 2007).

Ojo-Ade and Jagboro (2000), in a survey of the use of subject catalogues in Hezekiah Oluwasanmi Library, Obafemi Awolowo University, found that users were well informed and versatile in the use of library catalogues, especially the subject catalogue. The study also reveals that users record high success rate of user searches which was attributed to the respondents' knowledge of the use of the library gained from the library institution. Akin-Ojo (1994) states that library institutions would produce intelligent library users. Review from empirical studies among Ohio State University students reports that library instruction programmes improved the attitude of students towards the library, librarians and library services. Pearson and Tiefel (1982); Braimoh, Jegede and Chadzinwa (1997) believe that exposure to library enables users to develop their talent, potentials and capabilities both academically and socially.

Furthermore, surveys on library instructional programmes at various institutions have been gaining attention. In his research, Haws (1987) discovers that over half of the students felt library instruction courses made them more confident users of the library when it came to finding materials for a term paper. However, one-third surveyed disagreed with that statement. Not a large percentage of students in the sampling would consider a longer or more advanced library course. Damko (1990) states that 58.64 per cent of surveyed students taught themselves how to use the library and they believed that a library instruction course was valuable for other students. On the other hand, Barbar Bren, Beth Hillemann and Victoria Topp (1998) affirm that students receiving guided hands-on instruction retained more information than those attending a lecture or demonstration. Leighton and Markman (1991) discover from their survey that 72 per cent of the students felt that they had a positive experience, learning "some," "quite a lot," or "a great deal," and 27 per cent felt that they had learned "a little" or "nothing" following their bibliographic instruction. Highly positive results were achieved from Ojo-Igbinoba's (1991) research on the usefulness of library instruction classes.

Also, Geffert Bryn and Robert Bruce (1997) conduct a survey on the bibliographic instruction in St. Olaf College and find that students felt "comfortable" in learning the following ten skills in library instruction classes : Online catalogue, evaluating relevance of sources, choosing relevant tools, locally mounted electronic indexes, evaluating authority of sources, scholarly subject encyclopedias and dictionaries, subject bibliographies, inter-library loan, thesauri, journal indexes (print), and journal indexes (electronic). From the various studies above, it can be seen that students' attitude towards library instructions are mixed, some positive and some negative.

Methodology

The survey research design of the correlational type was adopted for this study. The population of the study comprise all 300 level science undergraduates in the six federal universities in the Southwestern, Nigeria except Federal University Oye-Ekiti (FUOYE). This is because the institution is a relatively new institution and its undergraduates have not reached 300 level. The 300 level science undergraduates were purposively selected in the departments used for the study because they have been in the system for at least a full session; therefore, their academic achievements were used for the study. There are one thousand, seven hundred and

eighteen (1,718) 300 level science undergraduates spread across these five selected federal universities in Southwestern, Nigeria. The multi-stage sampling technique procedure was adopted in selecting the sample size.

The purposive sampling technique was adopted to select five out of the departments that were commonly available in the faculties of science in the selected universities viz: Botany, Zoology, Chemistry, Computer Science and Physics while the total enumeration method was adopted in in selecting the respondents for the study. A total of 1,029 science undergraduates comprising 210 in Botany, 170 in Zoology, 276 in Chemistry, 236 in Computer Science and 137 in Physics were selected across the three federal universities chosen for the study (See Table 2).

Table 2: Sample size of students selected across the universities chosen for the study

		Core science programmes					
S/N	University	Department	Department	Department	Department	Department	
		Botany	Zoology	Chemistry	Computer Science	Physics	Total
1	University of Ibadan	33	48	79	97	47	304
2	Obafemi Awolowo University, Ile-Ife	97	78	111	52	38	376
3	University of Lagos	80	44	86	87	52	349
	TOTAL	210	170	276	236	130	1,029

Two research instruments were used in collecting data for the study. These were research questionnaires and desk study of students' academic records. The questionnaire comprises three sections. The first section was used to collect data on the background information on the respondents while the second and third sections were used to gather data on library undergraduates' library utilization and academic self-efficacy respectively. The second instrument comprise the results of the science undergraduates, the cumulative grade point average (CGPA) which was collected personally by the researcher from their respective Academic Planning's Office/Examination Record's Office and through the Dean to the HODs in the faculty of science in each of the selected federal universities that participated in the study.

The validation of the questionnaire was done by experts in the field of library and information studies at Centre for Educational Media Resource Studies for content validity. Their input on the adequacy and appropriateness of the items were recorded to determine the content validity of the instrument. Also, copies of the questionnaire were trial-tested on science undergraduate students at Federal University of Technology, Akure (FUTA) who were not part of the respondents selected for the study. This was to ensure the reliability of the instruments. The data collected were subjected to reliability coefficient variable by variable which gives results as follows: Academic Self-Efficacy ($\alpha = 0.77$) and Library Utilisation ($\alpha = 0.72$). The research questions were analysed using the descriptive statistics such as frequency count, percentage, mean, standard deviation and Pearson product-moment correlation while the hypotheses were tested using the multiple regression technique.

Data Analyses and Discussion of findings

A total of 1,029 copies of the questionnaire were administered on the science undergraduates, out of which 857 were returned and found useful for analysis responses. This gives a response rate of 83.3% which is considered adequate for this study.

Background information

Table 1 presents information on the demographic distribution and composition of undergraduates in the sampled federal universities in Southwestern Nigeria.

Table 1: Background information of respondents/participants

Demographic information			Frequency	Percentage
Institution of respondents	University of Ibadan		255	29.8%
	University of Lagos		281	32.8%
	Obafemi Awolowo University		321	37.5%
	Total		857	100.0
Gender of respondents	Male		485	56.6%
	Female		372	43.4%
	Total		857	100.0
Age range of respondents	16 to 20yrs		384	44.8%
	21 to 25yrs		473	55.2%
	Total		857	100.0

Table 1 presents information on the demographic distribution of science undergraduates in federal universities in Southwestern, Nigeria were 485 males (56.6%) and 372 (43.4%) female science students' that were sampled to participate in the study. This implies that there are more male science students in the universities, than female science students. Also, majority of the students were found to be within the range of 21 to 25 years (473, 55.2 %).

Research question 1: What is the level of academic self-efficacy of science undergraduates in federal universities in Southwestern, Nigeria?

Table 2: Academic self-efficacy of science undergraduates

S/N	Statement	MST	SMT	OFT	LET	Mean	SD
		Frequency/Percentage					
1	I could take well organized notes during a lecture	320 (37.3%)	451 (52.6%)	59 (6.9%)	27 (3.2%)	3.24	0.715
2	I have confidence in taking essay tests	209 (24.4%)	577 (67.3%)	71 (8.3%)	-----	3.16	0.549
3	I have the ability to understand most ideas that I read in text	125 (14.6%)	704 (82.1%)	24 (2.8%)	4 (0.5%)	3.11	0.425
4	I am able to study enough to understand content thoroughly	152 (17.7%)	610 (71.2%)	93 (10.9%)	2 (0.2%)	3.06	0.540
5	I can confidently relate course content to materials in another course	180 (21.0%)	525 (61.3%)	150 (17.5%)	2 (0.2%)	3.03	0.628
6	I have confidence in taking objective tests	169 (19.7%)	546 (63.7%)	138 (16.1%)	4 (0.5%)	3.03	0.614
7	I have ability to explain a concept to another student	145 (16.9%)	586 (68.4%)	125 (14.6%)	1 (0.1%)	3.02	0.656
8	I am able to earn good marks in most courses	129 (15.1%)	606 (70.7%)	122 (14.2%)	----	3.01	0.541
9	I have ability to tutor another student	147 (17.2%)	582 (67.9%)	98 (11.4%)	30 (3.5%)	2.99	0.653
10	I have confidence in using educational resources	121 (14.1%)	555 (64.8%)	178 (20.8%)	3 (0.4%)	2.93	0.598
11	I am able to listen carefully during a lecture on a difficult topic	181 (21.1%)	43.1 (50.3%)	244 (28.5%)	1 (0.1%)	2.92	0.704
12	I can confidently participate in class discussion	104 (12.1%)	559 (65.2%)	192 (22.4%)	2 (0.2%)	2.89	0.586
13	I could complete jobs and tasks relating to my academics easily	114 (13.3%)	507 (59.2%)	235 (27.4%)	1 (0.1%)	2.86	0.626
14	I could competently answer question in a large class	144 (16.8%)	424 (49.5%)	264 (30.8%)	25 (2.9%)	2.80	0.744
15	I could conveniently write a high quality term paper	58 (6.8%)	568 (66.3)	231 (27.0)	----	2.80	0.545
16	I am able to master contents in all courses	82 (9.6%)	496 (57.9%)	276 (32.2%)	3 (0.4%)	2.77	0.615
17	I find it easy getting good grades	101 (11.8%)	419 (48.9%)	335 (39.1%)	69 (8.1%)	2.72	0.664
18	I find it difficult to understand content thoroughly	41 (4.8%)	125 (14.6%)	622 (72.6%)	32 (3.7%)	2.16	0.626
19	I find it difficult understanding concepts and contents in my courses	7 (0.8%)	143 (16.7%)	675 (78.8%)	32 (3.7%)	2.15	0.465
20	I find it very difficult to make use of both print and non-print materials relating to my course	29 (3.4%)	135 (15.8%)	602 (70.2%)	91 (10.6%)	2.12	0.621
	Overall Weighted Mean					2.84	

MST- Most of the time; SMT- Sometimes; OFT- Often; LET- Less of the time

Considering the academic self-efficacy level of science undergraduates, Table 2 reveals that the grand mean of students' academic self-efficacy is 2.84 which is greater than the criterion grand mean (2.50) set for high level academic self-efficacy of science undergraduates student. Hence, inference can be drawn that undergraduate science students have high level of academic self-efficacy. This implies that the science undergraduates have high academic ability which is in support of Choi (2005) findings which reported college students as having high academic self-efficacy that has helped them in achieving higher standards in their academics. The finding of

this study on academic self-efficacy of students is further supported by Ramos-Sanchez and Nichols' (2007) which established that non-first generation college students had higher levels of academic self-efficacy and outperformed first generation college students academically. This indicates that some students may enter college better prepared. The high academic self-efficacy of the science undergraduates was affirmed through their agreement with the statements designed to measure their ability and capability to carry out academic related activities successfully. This result affirms that the science undergraduates are able to carry out basic academic tasks related to their learning.

Research Question 2: What is the frequency of library use among science undergraduates in federal universities in Southwestern, Nigeria?

Table 3: Frequency of use of library by science undergraduates

s/n	Statement	More than 3 times	Twice per week	Once per week	Never	$\overline{X}$	SD
1	Reference services	75(8.8)	92(10.7)	250(29.2)	440(51.3)	1.77	.958
2	Internet Information Services	84(9.8)	88(10.3)	137(16.0)	548(63.9)	1.66	1.010
3	Lending Services	45(5.3)	61(7.1)	242(28.2)	509(59.4)	1.58	.838
4	E-database search	31(3.6)	95(11.1)	204(23.8)	527(61.5)	1.57	.829
5	Photocopying services	38(4.4)	51(6.0)	273(31.9)	495(57.8)	1.57	.794
6	Reader Advisory Services	40(4.7)	46(5.4)	212(24.7)	559(65.2)	1.50	.812
7	Exhibitions and display services	82(9.6)	16(1.9)	130(15.2)	629(73.4)	1.48	.928
8	Book reservation services	8(0.9)	102(11.9)	154(18.0)	593(69.2)	1.45	.736
9	Extension services	33(3.9)	80(9.3)	106(12.4)	638(74.4)	1.43	.814
10	Translation services	56(6.5)	42(4.9)	98(11.4)	661(77.1)	1.41	.856
11	Current Awareness Services (CAS)	29(3.4)	55(6.4)	149(17.4)	624(72.8)	1.40	.757
12	Inter-library lending services	8(0.9)	68(7.9)	157(18.3)	624(72.8)	1.37	.670
13	Serial services	37(4.3)	43(5.0)	91(10.6)	686(80.0)	1.34	.764
14	CD-ROMS	9(1.1)	48(5.6)	159(18.6)	641(74.8)	1.33	.629
15	Electronic theses search	11(1.3)	44(5.1)	155(18.1)	647(75.5)	1.32	.631
16	Selective dissemination of information (SDI)	1(0.1)	55(6.4)	134(15.6)	667(77.8)	1.29	.584
	Overall Weighted Mean					1.47	

Table 3 shows the means for all the library services and resources considered in this study. All the means did not meet the criterion mean for the use of library of 2.50 set for regular use of

library services and resources. Overall weighted mean (1.47) is less than the criterion grand mean of 2.50. From the results obtained, it implies that undergraduate science students in federal universities in Southwestern, Nigeria do not make good use of library services and resources. Most of the science undergraduates affirm that they never make use of library services such as reference service, lending service, internet information service, readers' service and photocopying service among others just as they affirmed lack of use of library resources such as e-databases, CD-ROMs and electronic resources. This finding is corroborated by Ogunbote and Odunewu (2008) who submitted that reading of personal books/lecture notes is the major reason for which students make use of the library. Based on the findings from this study, the actual use of the library does necessarily lead to an improved academic achievement of the science undergraduate students. Inadequate provision of resources in the library may be responsible for the irregular use of the library by the undergraduate science students.

Research question 3: What type of relationship exists between academic self-efficacy and academic achievement of science undergraduates in Federal Universities in Southwestern, Nigeria

Table 4: Summary of relationship between academic self-efficacy and academic achievement of undergraduates in faculty of science in federal universities in Southwestern, Nigeria

Variable	Mean	Std. Dev.	N	r	P	Remark
Academic Achievement	3.25	1.223	856	.020**	.558	Not Sig.
Academic Self-Efficacy	76.43	7.485				

Table 4 presents information on the relationship between academic self-efficacy and academic achievement of the respondents. It reveals that there is a positive relationship between academic self-efficacy and academic achievement ($r = .020^{**}$, N= 856, P > .01) which implies that improvement in academic self-efficacy would lead to improved academic achievement among the undergraduates in faculty of sciences in federal universities in southwestern, Nigeria. The positive relationship between the variables implies that academic self-efficacy has the possibility of improving academic achievement of science undergraduates. Thus, high academic self-efficacy can lead to high academic achievement among science undergraduates and vice versa. This is in support of Ahmed and Bruinsma (2006) argument which reported a positive significant relationship between academic self-efficacy and academic achievement of students. Olatunde (2010) also reported that students with low academic self-efficacy showed low commitment to school tasks.

It can therefore be concluded that the more a student feels positive about his or her ability to carry out academic tasks, the higher his or her achievement be. Li (2012) also reports a positive relationship between academic self-efficacy and academic achievement and concludes that a student with high academic self-efficacy is more likely to indicate an increase in knowledge and confidence in dealing with the subject. On the other hand, Coetzee's (2011) study reveals an inconsistent result as it establishes that relationship between academic self-efficacy and academic achievement of science undergraduates may vary, based on their level of study. According to Coetzee (2011), sometimes a relationship exists between academic self-efficacy and academic achievement, as were the cases with the second and third year students, while at other times, none or a weak relationship exist between these two constructs, as in the cases of the first and fourth year students. With the second and third year students, a positive correlation was found between academic self-efficacy and academic achievement.

Research question 4: What type of relationship exists between library utilisation and academic achievement of science undergraduates in Federal Universities in Southwestern, Nigeria

Table 5: Summary of relationship between library utilisation and academic achievement of undergraduates in faculty of science in federal universities in Southwestern, Nigeria

Variable	Mean	Std. Dev.	N	r	P
Academic Achievement	3.25	1.223	856	.017**	.611
Library utilisation	43.12	14.178			

Table 5 presents information on the relationship between library utilisation and academic achievement of the respondents. It shows that there is positive relationship among library utilisation and academic achievement of the undergraduates (r = .017**, N= 856, P > .01) which implies that an improvement in library utilisation by the undergraduates in faculty of sciences in federal universities in southwestern Nigeria would lead to improvement in their academic achievement. This implies that library use would lead to improved academic achievement among science undergraduates in federal universities in Southwestern Nigeria. This is at variance with the finding of Nagata, Toda and Kytomacki (2010) survey on undergraduate students' pattern of use of library and their academic achievement which reported a negative relationship between pattern of use of library and academic achievement of students. Also, Goodall and Pattern (2011) finding on the relationship between academic libraries' non/low use and academic achievement of undergraduates reveals an inverse correlation, often with a narrow range, that one would question what some students are actually doing when they visit the library building. However, the findings from this study are supported by Toda and Nagata (2007) which establish a positive relationship between use of library and academic achievement of undergraduates.

Test of hypotheses

H_5: There is no significant joint contribution of academic self-efficacy and library utilization to academic achievement of science undergraduates in federal universities in Southwestern, Nigeria.

Table 6: Summary of regression analysis showing the joint contribution of academic self-efficacy and library utilisation to the academic achievement

R	R Square	Adjusted R Square	Std Error of the Estimate		
.054	.003	.002	1.224		
Model	Sum of Squares	df	Mean Square	F	P
Regression	3.707	2	.927	.618	.650
Residual	1275.805	853	1.499		
Total	1279.512	855			

Table 6 presents information on the joint contribution of academic self-efficacy and library utilisation to academic achievement of science undergraduates. The result shows a coefficient of multiple correlation R = .054 and a multiple R^2 of .003. This means that 0.3% of the variance in academic achievement of science undergraduates was accounted for by academic self-efficacy and library utilisation when taken together. Other variables not included in this model may

have accounted for the remaining variance. The significance of the joint contribution was tested at P < .05. The table also shows that the analysis of variance for the regression yielded an $F_{(2.855)}$ = .618; p > 0.05). This implies that the joint contribution of academic self-efficacy and library utilisation to academic achievement was not significant.

H_{02}: There is no significant relative contribution of academic self-efficacy and library utilization to academic achievement of science undergraduates in federal universities in Southwestern, Nigeria.

Table 7: Summary of regression analysis showing relative contribution of the academic self-efficacy and library utilisation to academic achievement

Model	B	Std. Error	Beta (β)	t	Sig.	Remark
Constant	3.063	.580		5.281	.000	
Academic self-efficacy	.007	.108	.031	.828	.003	Sig
Library Utilisation	.001	.003	.016	.442	.017	Sig

From Table 7, the results show that both academic self-efficacy (β = .031; t = .828; p < 0.05) and library utilisation (β = .016; t = .442; p < 0.05) have significant contribution contribute to academic achievement of science undergraduates. The implication to be drawn from this is that academic self-efficacy and library utilisation of science undergraduates are major determinants of academic achievement of undergraduates in federal universities in southwestern, Nigeria.

Summary and Conclusion

The study investigated the effects of academic self-efficacy and library utilization on academic achievement of science undergraduates in federal universities in southwestern, Nigeria. The study revealed that science undergraduates in federal universities in southwestern Nigeria have high academic ability to carry out academic related tasks but do not make regular use of library resources and services. A positive relationship was established among academic self-efficacy, library utilization and academic achievement of science undergraduates in federal universities in Southwestern, Nigeria such that an improvement in academic self-efficacy and library utilization would lead to an improvement in academic achievement of the science undergraduates. Thus, it is expected that students with high academic self-efficacy would perform better academically than their counterparts with low academic self-efficacy. The significant contribution of academic self-efficacy and library utilization implies that both academic self-efficacy and library utilization are potent determinants of academic achievement of science undergraduates

The conclusion that could be derived from this study is that academic self-efficacy, library do significantly determine academic achievement of science undergraduates. It can also be inferred from this study that inadequate provision of relevant information resources and poor environmental conditions are some of the reasons why students do not make use of the library. The fact that the study revealed a high academic self-efficacy of science undergraduates shows that it is in support of the positive relationship established between academic self-efficacy and academic achievement of science students.

Recommendations

The following recommendations were made based on the findings of the study:

1. University libraries should make provision for information resources that are relevant to the needs of science undergraduates in adequate quantity.
2. University libraries in Southwestern, Nigeria should make provision for infrastructural facilities to make the library environment conducive enough for use by the students and other users.
3. There is also the need for authorities of university libraries to intensify continuous orientation to draw the attention of the students to library resources available for use within and/or outside the library environment so that the students would be aware of these resources and ultimately use them. Observations have revealed that students are not aware of what resources available in the library most times.
4. Workshops and seminars should be intensified by university library management to intensified train students on how to access and make use of library resources and facilities.
5. University authorities should also facilitate programmes to ensure that the high academic self-efficacy of science undergraduates is sustained.
6. University libraries need to upgrade their electronic information resource facilities, such as: computers, the internet, electronic computer-based archives, databases, bibliographic databases on CD-ROM and data banks etc. This will also make the library environment conducive enough for use by the science undergraduates and other users.
7. A leisure/recreation room or section in the library should be provided, where library users/clientele could engage in activities to relax or enjoy themselves. In this section, they could watch various programmes on the television. They could similarly listen to various radio programmes of interest; play some indoor games, read novels, magazines and periodicals for relaxation and enjoyment.

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