

**International Journal of  
Education Quality**

**3rd Edition of the International  
Conference on Education Quality  
Innovation, Inclusion and  
Quality in Education:  
Managing STEAM**

**19-21 March 2020**

**ICEQ 2020 will be held at Ibn Zohr University, Agadir (Morocco) from 19th to 21st March. This 3rd annual conference combines face to face presentations with real and virtual ones, intended to embrace educators in a variety of professional contexts, including university faculties, administrators, and research students. The conference emphasizes innovative curriculum and programming in education that includes research and scholarly inquiry about the integration of science, technology, engineering, the arts and mathematics (STEAM).**



## NOTIFICATION OF ABSTRACT ACCEPTANCE

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**Attention Potential Paper Presenter:** If your abstract was approved by the Program Committee, you will receive the following message via e-mail from the Organizing Committee. Please set your spam filter to accept messages from "uiz.ac.ma" which is the address of the server that sends messages from the program committee to you.

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**Abstract ID:** ICEQ2020\_BNG95

**Paper Title:** ENGLISH FOR SCIENTIFIC PURPOSES: A RESTROSPECTIVE APPRAISAL OF PRACTICE AT FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

Dear HALIMA SHEHU,

Thank you for submitting your abstract for presentation at #ICEQ 2020, the 3<sup>rd</sup> Edition of the International Conference of Education Quality to be held on 19-21 March 2020 in Agadir, Morocco.

We have received several submissions from numerous countries so far. They are reviewed by our international experts of the Scientific Committee of #ICEQ2020 conference.

Our reviewers and the Technical Program Committee have reviewed your paper abstract and found that it meets preliminary acceptance requirements set forth by the Scientific Committee.

With heartiest congratulations, we are pleased to inform you that based on the recommendations of the reviewers of our Scientific Committee, your paper identified above has been **ACCEPTED** for oral presentation in the 3rd International Conference on Education Quality (#ICEQ2020). You may begin making your conference plans! Please save this message for reference.

Confirmation of your presentation on the final schedule is contingent upon receipt of your revised abstract within a week. Please finish the following steps to register your paper:

1. Revise your paper according to the Review Comments in the attachment carefully.
2. Format your Abstract according to the attached Template carefully.

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Herewith, the conference Organizing Committee sincerely invites you to come to present your paper at #ICEQ2020 to be held in Agadir, Morocco, March 19-21, 2020.



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You are encouraged to prepare a paper for review. A designated review coordinator will arrange for two independent and anonymous reviews. Papers deemed acceptable by this process will be included in the conference proceedings on our International Journal of Education Quality (IJEQ). If you submit a paper for peer review, you and/or your co-authors will be asked to conduct a review as well. We will be in touch with you in this regard in due time after the conference and provide you with our recommended paper guidelines.

Feel free to contact us if you have any further questions about your abstract submission. Please reference your submitted Abstract ID when contacting us. This will help us to respond to you most quickly and accurately.

Thank you for your interest and for working with #ICEQ2020. We believe that our collaboration will help to accelerate the global knowledge creation and sharing one step further. We look forward to working with you on a successful conference and to having your paper in our final publication package.

On behalf of the Organizing Committee.



Postponement of ICEQ 2020, Report d'ICEQ 2020, ICEQ 2020 تأجيل

ICEQINFO, ICEQINFO <iceqinfo@uiz.ac.ma>

Sun 08/03/2020 19:47

Dear participants,

In line with the Moroccan government direction not to hold any international events until further notice due to the global impact of the coronavirus outbreak, we deeply regret having to take the difficult decision to defer ICEQ 2020.

The health and safety of ICEQ delegates and the local community are of priority to the organizing committee. We will continue to assess the risk of the outbreak in line with the relevant Moroccan authorities' guidance and will keep you updated accordingly.

We understand the inconvenience this might have caused and truly apologize for it. A new date for the conference will be announced and sent to you as soon as possible.

Sincerely,

The organizing committee

Chers participants,

En raison de l'impact mondial de l'épidémie de coronavirus et conformément aux directives du gouvernement marocain qui consiste à ne pas organiser d'événements internationaux jusqu'à nouvel ordre, nous regrettons profondément de devoir prendre la décision difficile de reporter l'ICEQ 2020.

La santé des participants à l'ICEQ et de la communauté locale sont une priorité pour le comité d'organisation.

Conformément aux directives des autorités marocaines compétentes, nous continuerons à suivre l'évaluation du risque d'épidémie et nous vous tiendrons informés en conséquence.

Nous sommes conscients des désagréments que cela pourrait causer et nous en sommes sincèrement navrés.

Une nouvelle date pour la conférence sera annoncée et vous sera envoyée dès que possible.

Cordialement

Le comité d'organisation

السادة المشاركون في المؤتمر الدولي للجودة في التعليم ICEQ2020

تنفيذا لتوجيهات الحكومة المغربية الداعية إلى إلغاء كافة التظاهرات والملتقيات الدولية؛ بسبب التفشي العالمي لفايروس كورونا، نخبركم بكل أسف ب:

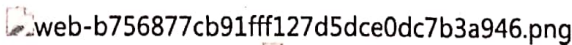
تأجيل المؤتمر الدولي للجودة بالتعليم 2020

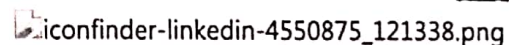
ذلك أن صحة وسلامة المؤتمرين، والمشاركين في المؤتمر، تعد بالنسبة لنا في اللجنة التنظيمية، من أولى الأولويات. وبناء عليه، فإننا سنستمر في تقييم خطر هذا الفايروس بتطبيق التوجيهات الحكومية الواردة علينا في هذا الشأن، كما سنزودكم بكل جديد في حينه.

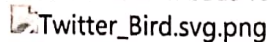
نرجو أن تتفضلوا بقبول اعتذارنا عن هذا الإزعاج الطارئ، كما نود إخباركم أننا سنوافيكم بالتاريخ الجديد للمؤتمر فور تحديده.

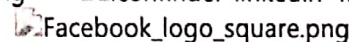
مع فائق الإحترام

اللجنة المنظمة

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## ICEQ 2020 Postponement

ICEQINFO, ICEQINFO <iceqinfo@uiz.ac.ma>

Fri 17/07/2020 22:22

To: ICEQINFO ICEQINFO <iceqinfo@uiz.ac.ma>

Dear colleagues,

We are hopeful that this letter finds you well and safe. We are writing to inform you that the circumstances in our world make international travel less likely this coming October for the rescheduled (ICEQ) 2020 conference and we have decided to postpone it until September 2021.

Instead, we are developing a series of virtual events, beginning in early September, 2020 that reflect topics that will be of interest and relevance to delegates. These will be sent to all of you shortly.

We join you in the disappointment that we cannot hold the conference in October in person but hope you will participate in our series, leading up to ICEQ 2021 in Agadir.

Professor Abdelaziz Bendou  
Conference Chair

Chères / Chers collègues,

Nous espérons que cette lettre vous trouvera en bonne santé. Nous vous écrivons pour vous informer que les circonstances actuelles rendent les voyages internationaux fortement improbables pour maintenir la conférence ICEQ 2020 en octobre prochain. Nous avons décidé, ainsi, de la reporter au mois de septembre 2021.

En guise d'alternative, nous développons une série d'événements en ligne, à partir du mois de septembre 2020, autour de sujets pertinents qui vont vous intéresser. Le programme est en cours d'élaboration.

Nous nous associons à votre déception de ne pas participer en personne à la conférence en octobre, mais nous espérons vous compter parmi nous lors de l'édition ICEQ 2021 à Agadir.

Professeur Abdelaziz Bendou  
Président de conférence

السلامة للزملاء المحترمين:  
نتمنى أن تجدكم هذه الرسالة وأنتم تصومون بموقور الصحة والعافية.  
نود إخباركم أن الظروف الحالية التي يعيشها العالم، أثرت على التنقل نولياً؛ الشيء الذي انعكس على موعد المؤتمر الدولي للجودة (ICEQ) حيث قررنا تأجيله حتى سبتمبر 2021.  
وعوضاً عن ذلك، قمنا بتصوير جملة من اللقاءات الافتراضية تبتدى من الأول من شهر سبتمبر أيلول 2020؛ وهي تتناول المواضيع ذات الأهمية والنسبة للمشاركين في المؤتمر، وستوصلون بها تباعاً في الوقت المناسب.  
نقاسمكم خيبة الأمل في عدم تمكننا من تنظيم هذه النسخة الحضورية من المؤتمر كما كان محنداً في أكتوبر، لكن كلنا أمل أن تتواجدوا للنسخة المقبلة من المؤتمر خلال 2021 في أغادير المغرب.

الأستاذ عبد العزيز بنصو  
رئيس المؤتمر

PF: 180

28<sup>th</sup> February, 2020

**Dr. Halima Shehu,**  
Department of General Studies,  
Federal University of Technology,  
Minna.


**RE: PERMISSION TO BE ABSENT FROM THE UNIVERSITY**

Please, refer to your application dated 19<sup>th</sup> February, 2020 on the above subject matter.

I am directed to convey in retrospect the Vice-Chancellor's approval for you to be absent from the University with effect from **16<sup>th</sup> to 23<sup>rd</sup> February, 2020**. This is to enable you attend *International Conference at Ibn Zohr University, Agadir, Morocco*.

You are expected back to your duties in the University, on **Monday, 24<sup>th</sup> February, 2020**.

Thank you.

  
**Suleiman Adamu Idris**  
*PAR (Establishment)*  
**For: Registrar**

CC: Vice-Chancellor  
Dean, SSTE  
~~HOD, General Studies~~  
PF: 180  
Flimsy



**ENGLISH FOR SCIENTIFIC PURPOSES: A RESTROSPECTIVE APPRAISAL OF  
PRACTICE AT FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA**

**BY  
HALIMA SHEHU**

General Studies, School of Science and Technology Education  
Federal University of Technology, Minna

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**Abstract ID: ICEQ2020**

The concept of English for Special Purposes (ESP) was introduced into Nigeria through the Communication Skills Project and was initially embraced as an innovative methodology that would address students' deficiencies in higher academic reading and writing. The learner-centered approach advocated by Hutchinson and Waters led to the designing of a new course to teach the ESP sub-category known as English for Science and Technology (EST). The focus was primarily on needs analysis, material production, and preparing learners to communicate effectively in their fields of specialization. For two decades, this approach impacted positively on language learning and use. However, in recent times it has experienced a number of challenges that have had an adverse effect on the quality of student learning and for the much desired development of science and technology in Nigeria. The process of implementing an EST course and the difficulties of maintaining teaching quality are examined in this review. Recommendations are also made to help inform future directions for the ESP/EST approach in a second language learning context such as found at Federal University of Technology, Minna.

**Keywords:** ESP, EST, Language Learning, Learner-Centered, Reading, Writing

### **Introduction**

In the late 1960s, where previous researches in English Language Teaching (ELT) were preoccupied with the describing the rules of English grammar and lexis, new studies began to shift attention away from defining the formal features of English language usage to discovering ways in which the language is actually used in real communication. This move was particularly evident in the field of English as Second Language (ESL) in which a major area of interest emerged that became known as English for Special Purposes (Hutchinson and Waters, 1987; Dudley-Evans 1998; Hyland, 2002). Researchers discovered that the use of English varied considerably from context to context therefore new ways of describing the language and new approaches to teaching it were required in order to meet learners' needs. Where before attention was focused on what people learned (language-centered), English for Special Purpose (ESP) evolved into a learner-centered approach to language teaching that was more focused on how people learned (learner-centered).

Informed to some degree by developments in the field of Educational Psychology that focused on learners and attitudes to learning, ELT experts put forward a number of definitions to explain the basis for English for Specific Purposes language courses. For instance, Mackay and Mountford (1978) defined ESP as the use of a particular variety of English in a specific context and that is justified mainly by the needs of the learner. While for Coffey (1985), ESP is "a quick and economical use of the English language to pursue a course of academic study or effectiveness in paid employment" (p.79). In *English for Specific Purposes: A Learning-centered Approach* (1987), Hutchinson and Waters brought greater clarity to the concept of ESP by explaining how it fits into the general landscape of English as a Second Language (L2) teaching. For them, ESP is fundamentally an approach to language teaching in which all decisions as to content and method are "learner-centered", that is, based on the learner's reason for learning. Their position was summed up in the statement: "Tell me what you need English for and I will tell you the English that you need" (Hutchinson and Waters, 1987: 8). ESP continues to be described as a pedagogy that is driven by "learner-centeredness" (Johns and Price-Machado, 2001). At its heart, ESP essentially strives to give learners access to the language they both want and need to successfully accomplish certain academic or occupational goals. Hence, ESP courses are based on the need to express the facts and ideas of particular subjects after which students should be able to read the specialized subjects and speak or write fluently about them.

In other attempts to define ESP, some exponents divided its characteristics into those that are "absolute features" which include meeting the specific needs of learners (Maslow's hierarchy of needs) by ensuring that the course is related in content to particular disciplines or occupations and centered on language specific to them. Among important variables outlined by Strevens (1988) is that an ESP course could focus on specific language skills such as only reading or writing and did not have to be taught according to a particular methodology. Functional in purpose and targeted at students who need to learn English in order to acquire knowledge and skills in other fields, the learning of English as a second language (L2) is basically seen as a means to an end where the ESP approach is concerned (Belcher, 2010). Out of ESP emerged the sub-category that became known as English for Science and Technology (EST). Some theorists simply consider this a sub-branch of other incarnations of ESP such English for Academic Purposes (EAP) or English for Occupational Purposes (EOP). But others are of the view that EST cuts across the two because it has both occupational and academic applications (Hutchinson and Waters, 1987; Paltridge and Starfield, 2013).

The importance of language in academic work especially in a second-language situation cannot be overlooked or underestimated. As eminent scholars, Honda and O'Neil (2008) assert, inquiry into how knowledge of language is acquired and used should have a prominent place in science education. Hence, the usefulness of ESP as "an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning" becomes significant (Hutchinson and Waters 1997).



However, the benefits of ESP are better grasped when the complexities of language learning are taken into consideration. Where ESP practitioners were concerned, teacher intuition and mere knowledge of language systems are inadequate for teaching in second language (L2) situations rather, an understanding of language used in specific contexts is required. Some studies have noted that people's linguistic needs appear to change depending on the activities being performed indicating that in some circumstances, it may be necessary to tailor language skills to learners' specific requirements. While General English courses were adequate for training language skills required for everyday activities such as socializing, reading newspapers and so on, there exists a large range of specialized topics in academics, business, science, and technology where linguistic items need to be used professionally. Thus ESP experts are of the view that in order to deal with topics familiar to only a few, a mastery of the specialized language pertaining to them is necessary. Partridge and Starfield (2013) therefore claim that ESP is the teaching of English as a second or foreign language where the goal of the learners is to use it in a particular field. They further noted that while the reasons behind the ESP approach have remained largely unchanged since it was first introduced in the USA, the practice of it has been impacted by different variables according to the country where it is adopted.

This is why it is important that actual instances of ESP practice are reviewed at regular intervals for what they may tell us about the future direction of ESP. While discourse on ESP continues to expand and become more sophisticated, reviews of actual practice such as undertaken here have been rare. Indeed, in his final editorial in the flagship *ESP Journal*, Dudley-Evans (2001:312) similarly hinted at necessity of periodic reviews: "While not in any way rejecting the need for theory and analysis in ESP, I do feel that we are reaching a stage where we need to consider how effective the courses that are developed from research are. Are we really delivering in the ESP classroom? Are students in ESP classes more motivated than those in General English classes?" These are pertinent questions for institutions such as Federal University of Technology, Minna that have adopted this approach.

#### **English for Special Purposes in Nigeria**

The concept of English for Specific Purposes (ESP) was first introduced into Nigeria in 1984 at Bayero University, Kano, during a conference that was aimed at identifying English language problems peculiar to students in Nigerian tertiary institutions (Freeman and Jibril, 1988). It directed the attention of stakeholders in education to a new way of handling English language teaching and learning. Forerunners in adopting this approach were the newly established Federal Universities of Technology, Owerri (1980), Abubakar Tafawa Balewa, Bauchi (1980), Akure (1981), Yola, now Modibbo Adama (1981), and Minna (1983) as well as Universities of Agriculture at Abokota (1988) and Makurdi (1988). These institutions were primarily created to provide sound training for students who would eventually become professionals in critical areas of national development, namely, science, technology, and agriculture.



Historically, English has served as a unifying language that has enabled interactions between diverse peoples in a country where over five hundred distinct languages are spoken. As the official language of government, corporate business, and the media, it has assumed a second language status. The dominance of English is further highlighted in the educational sector where it is the main medium of instruction. Presently, and perhaps for the foreseeable future, there appears to be no alternative to English as far as higher education in Nigeria is concerned. Even before the Kano conference, it was realized that students' competency in the English language skills required for higher level education needed upgrading. As language problems became increasingly evident in students' academic work, a number of attempts were made to find solutions. At primary and secondary school levels, new curricula were designed and new textbooks were written and recommended for schools. While at the tertiary level, the Use of English course which is similar to the Freshman Composition found in American Universities became a compulsory graduation requirement for all students. However, these efforts did not yield expected results as proficiency levels particularly in writing continued to plummet at an alarming rate.

Certainly by the late 1980s when ESP began to gain a foothold in Nigeria, English was already recognized as the language of international communication. Now, in the 21<sup>st</sup> century even more so than before, "English has become the second language of everybody" (Warschauer, 2006). It has become a language that has in many ways assisted globalization which in turn further consolidated English as the world language (Graddol, 2001; Crystal, 2003). Nowhere is more apparent than in the fields of science and technology where it has become the lingua franca (Tardy, 2004, Lowe, 2009). Referring to the predominance of English in these areas, some studies claim that more than 75% of international scientific communications are written in the English language (Research Trends, 2008; Hamel, 2007). Evidence of this can be seen in the quantity of researches in science and technology being disseminated at a rapid rate to far reaching audiences especially through the internet where according to Graddol, 80% of the world's electronically stored information is in English. The greatest utility value of English therefore lies in the fact that it is the foremost medium by which scientists exchange information with others of different nationalities. Hence, experts in field of language development, (Honda & O'Neil, 2008; Orr, 2012) continue to stress that inquiry into and knowledge of language should be given a prominent place in science education particularly for L2 students.

Consequently, as the ESP approach was expected provide better access into that international community of scientists, the decision to adopt it in Nigeria was almost inevitable. This was a significant move especially for the new Universities of Technology and Agriculture because students in these institutions traditionally distanced themselves from a close study of the English language. Yet, this same category of students would eventually need to operate in fields of research and development that have adopted it as the main medium of communication. Hence, adopting an approach that facilitates second language use that could enable students grasp the



nature of scientific inquiry, articulate critical thinking, and strengthen problem solving skills was important for Nigerian institutions. English for Science and Technology (EST), a variant of English for Special Purposes was therefore embraced to combat the problems of reading and writing being experienced by learners in Nigeria.

However, while the period between 1986 to 2006 proved most productive in the use of the EST approach, presently, less importance appears to be attached to English language learning for science students, and by extension, for innovative language methodologies. The following will attempt to answer questions: What impact was EST expected to have on the quality of language learning? Why has the enthusiasm with which ESP was first received waned? What challenges has this approach encountered? And how do these difficulties affect the quality of language teaching and learning? This retrospective therefore revisits the reasons behind its introduction and examines the factors that affect its current status in FUT, Minna.

#### **English for Science and Technology at FUT, Minna**

The emphasis of ESP on "goal oriented language learning" makes it a better proposition for Nigerian students for whom English is second language (L2). The success of the ESP sub-category, English for Science and Technology (EST) course in countries like Chile (Ewer, 1983) further encouraged the adoption of the same in Nigeria. Therefore, through the five year British Council funded COMSKIPTECH Project, Federal University of Technology, Minna (FUT, Minna) and other similar institutions, with the guidance of eminent ESP scholars such as Tom Hutchinson, Alan Waters, and Maggie Jo St John embarked upon a process of designing English for Science and Technology course under what was broadly termed the Use of English.

Adopting the ESP approach was not without hurdles mainly because teachers at FUT, Minna whose qualifications were in Education, English Language, and English Literature had to adjust previously held ideas on how linguistic skills were acquired. They had to learn new ways of describing the English language, design a new course, create new learning materials and teach them. These demands called for a paradigm shift on the part of all of those involved, teachers, learners, as well as the university administration. To assist the process, a number of workshops and short summer courses sponsored by the British Council to retrain professionals were organized to facilitate the introduction ESP into the language classroom.

One important question that had to be addressed was how much subject knowledge EST language teachers needed to have to enable them cope with unfamiliar subject matters in science and technology. Responses to this particular problem were varied. For Troike (1994) "it is far easier and more efficient, to train science subject matter specialists in the basics of English language learning (ESL) rather than to try to train ESL teachers in the technical content of the ESP subject". Taylor (1994) on the other hand, asserted that since students already possessed content knowledge that ESP teachers could exploit, the only stumbling block to the successful

implementation of an EST course would be the individual attitudes and interests of ESP teachers involved. But Johns and Dudley (1991) claimed that the two contrasting views could be resolved through team teaching where both content teachers and the language instructors worked together towards achieving the aims of the language course. At FUT, Minna adopted the latter position by initiating collaboration between the language teachers and their colleagues in specialist departments.

The EST course that eventually emerged had three major characteristics. Firstly, it centered on the language of the students' disciplines; secondly, it was related in content (topics) to science and technology subjects taught in the various university departments; and thirdly, discipline-specific materials were jointly developed by subject and language teachers. It is important to state here that FUT students are not beginners in English but come into the University with the minimum requirement of a credit pass in English in the West African Examination Certificate (WAEC) which implies a certain level of competence in the language of instruction. The approach that was adopted therefore concentrated on what Lorenzo (2005) described as teaching 'language in context rather than on teaching grammar and language structures' that had already been covered in secondary school. The course content that eventually emerged therefore adopted a situational approach that built on previously existing knowledge in an effort to enable learners' link language goals to their fields of specialization.

### **Course Design**

Designing an effective ESP course required that a number of clearly delineated steps be followed. At the onset, an investigation in the form of a needs analysis was conducted to gather information about the objective needs of learners. Sometimes described as the "gap between current conditions and desired conditions," the needs analysis was conducted for the four Schools that initially made up the Federal University of Technology, Minna in the 1980s. These were the School of Science and Science Education (SSSE), School of Agriculture and Agriculture Technology (SAAT), School of Environmental and Environmental Technology (SET), and School of Engineering and Engineering Technology (SEET). Then, the overall student population stood at four thousand out of which between eighty and hundred new students registered for the language classes annually. By 2018, three additional schools, School of Information and Communication Technology (SICT), School of Infrastructure, Process, and Engineering Technology (SPET), the School of Entrepreneurship and Management Technology (SEMT) were established. Presently, the student population has grown to more than seventeen thousand out of which about five thousand enroll every year for the Use of English/ EST course.

While the needs analysis provided the basis upon which all other decisions were made, the language teachers needed to refine some of their research skills. As a result, over the period of one academic year (1985-1986), a number of training sessions were conducted both in the United Kingdom and within Nigeria to enable the teachers at FUT, Minna and similar universities to



overcome initial difficulties with needs assessment. Questionnaires on students' expectations and those of their departmental lecturers formed a major part of preliminary steps taken. The responses revealed a significant disparity between the students' awareness of the necessity of English in their studies and the level of competence that their science subject teachers expected of them. While 61% of students agreed that the English language was a significant factor in accomplishing their academic work, 39% did not consider it important where their science and technology courses were concerned (Ibrahim, 1988; Fashola, 1989). A major 89% of the students believed that a credit pass in WAEC English was a sufficient measure of their language competencies. On the other hand, subject teachers were concerned with how poorly the students appeared to grasp scientific concepts and in how their knowledge was expressed in written tasks. Yet, understanding the written medium in science and technology disciplines and the accompanying necessity to think and write about them were critical factors for academic success. Hence, negotiating between the two positions and taking into account the information gathered about the linguistic demands of the different fields of specialization, a two-year English for Specific Purposes course that strove to be "goal-directed, learner-centered and situation directed" (Javid, 2013) was in place by 1988.

#### **Language Skills-Reading and Writing**

Starting out, the expectations of subject teachers in the science and technology fields of their students were identified and then learners' language difficulties in meeting them were taken into consideration to develop appropriate course directions and learning materials. In the process, evidence from responses gathered from the questionnaires administered to learners and their subject teachers as well as the analysis of students' written assignments revealed that reading and writing skills demanded the most attention (Ibrahim, 2004). The decision to focus on these two language skills was supported not only by experience but also by empirical data (Olupke, 1993; Aborisade, 1997). The ESP/EST course that was designed at FUT, Minna therefore aimed at refining students' English as Second Language (L2) skills by laying a foundation that would make them better readers and writers of science and technology subjects.

In any effort to attain a more advanced level of second language use, reading and writing skills complement each other but at FUT, Minna, many of the students struggled with the specialized language of the sciences resulting in reluctance to read materials related to science and technology courses. Hence, reading materials gathered from various sources were useful in giving learners some idea of "good" writing as it exposed them to different kinds of information and ways of organizing writing which could serve as a guide for their own writing. First year students in particular struggled to read and understand scientific texts and would reach the end of texts with little or no comprehension. The difficulties they experienced did little to motivate them to read, instead, they relied on copies of teaching notes which they crammed to enable them pass examinations. Similarly, the collaborative work between science subject lecturers ar

English teachers resulted in a better understanding of learners' language needs and how to handle the process of learning.

As scientific and technical texts communicate complex information with peculiar terminologies, concepts and micro-discourses, the reading component of the EST course focused on learning activities that supported comprehension before and during reading. As Hale (2008) asserted, investigating the patterns and structures of language is an accessible way to develop scientific thinking in students. Motivating them to "think" linguistically- comparing, contrasting, and constructing explanations for scientific data helps to develop an understanding scientific method. In this way, language learning became a conscious exercise that required them to interact with written material, understand it, and use the knowledge gained as a launching pad for their own writing. Through reading comprehension tasks, students learned the importance of clarity and relevance which they needed to demonstrate in their own writing. Thus, at FUT, Minna, reading and writing tasks were designed to enable the learners comprehend written material, support or critique scientific postulations and make connections that enabled them to apply or create information using similar language structures. It was therefore expected that learners' ability to produce genre-appropriate texts would be demonstrated in their skills at providing rhetorical responses that not only involve some degree of innovation and judgment but also as Tardy (2009) writes 'builds upon their knowledge of prior texts'.

At FUT, reading tasks were designed and tested for effectiveness exposing students to new technical concepts and multiple text structures. Informative texts which imparted straight forward knowledge in the form of background or introduction, ideas, concepts, explanations were tackled first. This was followed with expository texts that focused mainly on five structures - description, sequence, classification, comparison, cause and effect. A combination of reading techniques were adopted to enable them to anticipate information in written texts, handle complex sentence structures and extract the main points, to distinguish minor details and make inferences as part of strategies to teach effective and efficient reading. Learners' attention was drawn to text organization and flexible reading approaches such as skimming and scanning to make reading less laborious and to enable better retention and recall of information. Learners were encouraged to practice these techniques in and outside the classrooms.

While the reading comprehension exercises made use of texts relevant to the various disciplines, they were graded from easy material to more complex pieces over the period of the EST course. Questions that required learners to interpret texts to gain meaningful understanding encouraged them to focus on the reading purpose. Such reading tasks had the positive effect not only in terms of comprehension but also in recalling information. Following such steps in reading, as Webb (2005) noted, allowed learners to analyze concepts, connect ideas as to previous knowledge and perhaps adopt a personal view of topic. Furthermore, the language input learners received in the form of reading practice in various kinds of scientific texts served to immerse them deeper in



their specific disciplines and to have the added effect of encouraging them to voluntarily read more.

In the reading component of the course, vocabulary development also received some attention because in the needs analysis undertaken, a significant 87% of learners expressed a desire for more practice in this area. In science, words fall into broad components of technical and non-technical. For example, words such as *photosynthesis*, *respiration* and *genes* in biology; *voltage*, *momentum* and *disintegrate* in physics; *atoms*, *elements*, and *reaction* in chemistry are technical terms that are specific to these science disciplines. Then there are instances where common words acquired different meanings when used in science and technology subjects. For example words such as “*define*” and “*explain*” are used instead of “*say*” or “*calculate*” and “*predict*” instead of “*think*” attain new meanings to become science words. Consequently, although too much focus grammar and vocabulary was avoided, attention was devoted to some that learners often encountered to enable them ‘interpret and use fluently’ in order to be successful in academic discourse (Cummins et al, 2007; Johns, 2013). Therefore, with the cooperation of subject teachers, a list of basic vocabulary peculiar to each discipline was gathered because the importance attached to them for the development of scientific understanding.

The other critical language skill that the EST course focused on was writing. It was through writing that students noted down their observations, gathered data about their investigations, analyzed and interpreted their experiences. In other words, writing helped them to clarify thinking, synthesize ideas, and communicate them to others. Writing occurred mainly in the form of note taking and research writing. In writing component at FUT, Minna, the ESP/EST methodology that was adopted represented a significant shift from a product-focused approach to one that was more process oriented. Practice in writing expository texts that asked for definition, classification, comparison and contrast, summary and so on as found in various forms of academic texts were incorporated in the activities designed for learners. Focus was on the mechanics of such writing in an attempt to expose the students to the ‘formulae’ of scientific material. Once familiarity was established, learners were then motivated to repeat the same format in their own writing without too much effort. As Perl (1980) explained, effective writing is a “recursive process” whereby the learner returns backwards to parts of the process in order to move” forward. The students were therefore required to write to specifications - to plan, and to then write in a series of steps that progressed from one stage to another after which they reviewed what was set down, amended or corrected before concluding the task.

Writing in the EST course at FUT, Minna was mainly handled as a form of problem-solving in which the learners were faced with tasks of answering questions on written material and composing ideas in writing in L2 that was comprehensible to the reader and met academic goals. Different kinds of technical texts require distinct linguistic functions to be performed. Hence, structured practice on a variety of technical report writing such as found in laboratory reports, experimental researches, field studies, surveys, case studies and so on were incorporated in the

course. Most of the writing tasks took into account the key steps involved processes in science and technology. For instance, in writing experimental research reports, there was need to introduce the topic, to include procedural descriptions, the equipment used, the methodology followed, and to write about findings. Individual sections had particular grammatical features that distinguish each step and could be written in different registers. The linguistic features taught therefore had to be in consonance with the practical needs of the learners in terms of grammar, lexis, register and discourse (Umera-Okeke and Okeke, 2014). As the initial needs analysis identified the prevalence of wrong use of tenses (45%), errors of agreement (48%), choice of prepositions (32%), sentence construction and ambiguity (26%) in students writing, emphasis was placed on the use of grammar in scientific writing in the EST course designed at FUT, Minna (Ibrahim, 2004). What followed next was the production of effective teaching and learning materials.

### **Materials Production**

ESP/EST employs the use of teaching materials suited to the specific needs and subject specializations of students. The key role of materials in ESP is therefore to expose students to the language of a particular discipline as it is actually used or as Dudley-Evans and St John (1998) put it, 'real language'. Hence, materials development was an important aspect of the course particularly as readymade text books tailored to such specific needs are not always available. Taking the learner-centered approach, materials design in ESP is therefore takes the stance that effective materials are those that are based on the specific language difficulties of and learning objectives of learners. Consequently, in developing materials that represented models of appropriate language use, efforts were made to balance learning needs, language content and subject-matter.

Teaching materials serve not only as a source of learning, they are also important for motivating learning and for use as reference material (Dudley-Evans and St John, 1998). In generating appropriate material, language teachers at FUT had the choice of either producing fresh instructional materials or adapting the existing ones in science and technical texts from the various departments to suit their purpose. Here, cooperation and collaboration between similar Universities of Science and Technology proved valuable for the creation of new teaching and learning materials. A number of workshops held at three Federal Universities of Technology at Owerri, Minna and Akure provided training in designing text-based materials for different aspects of the ESP/EST course. These were then peer-reviewed before being utilized in the classroom. Feedback on materials designed by individual teachers and classroom experiences were shared in the National Association of Teachers in English as a Second Language (NATRESL) journal which was published until 2013. However, in many instances, the ESP/EST teachers preferred to use existing material brought to their attention by science subject teachers which they adapted by simplifying, modifying, reordering, deleting and/or adding information where necessary to teach the skills that they wanted to impart to the learners. As advocated by



the Hutchinson and Waters learner centered approach, the primary concern was with materials that 'centered on language and activities appropriate to particular disciplines' of the students.

However, while the needs of learners were important factors in materials production, it was necessary to also take the needs of teachers into consideration because while teaching materials could be generated directly from the learners' specific academic disciplines, there was the danger of demanding too high a level of specialist knowledge from the language teachers. At FUT, Minna, this difficulty was tackled by using materials based on general science knowledge that were more accessible as much time could not be devoted to decoding technical information in texts that were used for language stimulation. Language teachers were therefore exposed to basic scientific English to increase their awareness of language items that are common to all science subjects. To achieve this, the most important meaning-bearing linguistic items shared by scientific texts regardless of specialization were identified. As the students were not blank slates but came with some background knowledge from their secondary school education, it was important to provide material that offered them opportunities to bring that previous knowledge to bear in the tasks given to them. Ultimately at FUT, the course first focused on mastery of the basic rudiments of reading and writing of scientific and technical material. A manageable number of materials that focused on mastering reading and writing of advanced scientific and technical material were selected for use keeping in mind the suggestions of Hutchinson and Waters that the materials designed should 'contain interesting texts; enjoyable activities which engage learners' thinking capacities, opportunities for learners to use their existing knowledge and skills; content with which both learners and teachers can cope (p.107). Furthermore, in creating ESP activities that were 'teachable', care was also taken that students did not end up looking upon them as templates thereby stifling individual creativity (Adam and Artemeva, 2002:179).

Thus to large great extent the EST course designed and taught at FUT, Minna from 1986 followed accepted ESP guidelines of needs analysis by which students' language problems were identified and which in turn informed the learning materials that were produced. Feedback on the success of this approach came first from colleagues in the science and technology departments who noticed improvements students reading and writing activities. And more importantly, from potential employers of labour who later remarked positively on the communicative abilities of FUT students on work placements in comparison to their counterparts from conventional universities. However, by 2005, changes in the situational context of EST began to impinge on the effectiveness of the course. A study conducted by Ibrahim (2006), found that employers were less confident in graduates' ability to articulate or execute written communications in fields of science and technology.

### **Present State of EST**

The observation of Douglas (2000) that learning contexts are “dynamic, continually changing situation” (p. 89) is an apt description of the shifts in perspective and conditions of language learning that occurred at FUT. The ESP approach was first embraced in Nigeria because it focused on the language needs of students in their specific disciplines but was initially seen as an exciting move into a brave new world of innovative language teaching changed track by 2004. Not least was fact that a course that was initially designed to be taught over the period of four semesters in the Foundation class and first year undergraduate studies had by 2004 become compressed into only two semesters. A development that is interestingly similar to Ewer’s (1983) description of the EST experience in Chile in the late 1970s, and indeed of challenges still being experienced there (Muñoz, 2011). Over time, a number of factors that fall into three broad categories as in the following combined to diminish the effectiveness of ESP/EST at FUT, Minna:

#### **1. Institutional Factors**

In course of the time since it was first introduced into Nigeria, a shift has occurred in institutional position with regards to ESP/EST. Although, the Use of English course has remained a compulsory graduation requirement for all students, official management attitudes towards the course has leaned towards marginalization in terms of resources allocated thus severely constraining the function of the ESP approach. Presently, subsumed under “General Studies”, the potential of the ESP/EST course to positively improve language learning outcomes for students has been eroded. It is no longer seen as an enabling course but rather as a minor aspect of students learning with no specific bearing on the rest of the curriculum. This loss of status is immediately evident in the relegation of the course on the academic timetable. As Hutchison and Waters (1982) rightly pointed out, the number hours allotted for learning English on the timetable reflects the true importance attached to language learning rather than any imagined value attributed to it. What initially used to be a two year course at FUT, Minna is now compressed into a one year programme with consequent effect on the quality of teaching and learning. Where previously, four contact hours per week were allocated for English, from 2005, it was reduced to two hours which meant less language instruction for the students. This is further compounded by increasingly large class numbers that range from four hundred to over one thousand without additional teachers being recruited to help manage class sizes.

#### **2. Teacher Factors**

As happened in Chile, over the years, the loss of pioneer EST teachers through dismissals and deaths has deeply affected the quality of the course. Where previously it was a ratio of one teacher to 40-50 students, now it is a minimum of 400 learners to a single teacher. As a result, classroom sessions have become increasingly teacher dominated as the language course is taught like any other subject such as physics or chemistry. The other problem is that while any good teacher of English has the potential of becoming a competent teacher of ESP, this is possible



only if there is institutional support in the form of trainings and appropriate resources are made available. New language instructors who have not been exposed to the kind of trainings funded by the British Council in the 1980s soon revert to the General English teaching methodology with which they are more familiar. Teacher confidence is further reduced by the obvious low status assigned to the English course at FUT, Minna. There is lack curiosity or interest in learners' fields of study on the part of language teachers which appears to affect the service they deliver. Yet an understanding the language of specific purpose/disciplines is important in order for teachers to learn how to efficiently put it over to the students. For EST practice to be effective, language teachers have to be able to diagnose learners' problems, to sharpen their skills of language analysis before this alternative teaching technique can be employed to meet the learning requirements of students. Retraining opportunities would help sharpen teachers' skills of language analysis and help them to decide what to teach using the ESP approach.

### 3. Learner Factors

That learners needs and interests 'have an important influence on their motivation to learn and therefore on the effectiveness of their learning' (Hutchinson and Waters, 1987) has always been the cornerstone of the ESP approach. Hence, in the beginning at FUT, by focusing on developing the language needs of students in their specific disciplines, the EST/ESP approach sharpened the purpose of learning English as Second Language (L2) and thereby motivated them to invest time and effort in mastering and advancing the use of it in academic work. In those early years of ESP/EST, students felt supported enough to undertake unfamiliar learning tasks that encouraged their L2 development. However, when the value placed on English became less pronounced, it inevitably affected their perception of the course. Presently, with the shift in management position in terms of resources made available for the course, students soon realized that while they are required to pass it, the course is officially treated as a marginal one. The limited time given to the course on the academic timetable has restricted the scope of learning activities with which teachers could engage their interest and further motivate them. The achievements recorded in students' language learning and use between 1985-2002 when the EST course was taught in class sizes of fifty students over the period of two years of Foundation 1 and 11 highlight the deficiencies now apparent in a situation of large classes of five hundred or more and a course that is presently confined to two semesters. Under pressure of inadequate time, manpower, and overly large classes, effective classroom practices such pair or group activities as recommended by the ESP approach have been abandoned impacting negatively on the overall quality of the course. While Hutchinson and Waters, stressed that ESP/EST is not only 'pragmatic', 'efficient', 'functional' approach but also one that is ultimately 'cost-effective' this view has not permeated in Nigeria. As happened in India, once the funding from the British Council came to an end, the lack of support from the government affected the practice of ESP/EST.

## Recommendations

As the theory of ESP continues to develop, an examination of an actual instance of practice could help inform future directions for this approach to language learning. What this review set out to do was to highlight the need to take country context into consideration when examining the practice of ESP/EST. As Oluipke (1993) once observed, the greatest challenge for the ESP/EST programme in Nigeria is that of survival. Undoubtedly, where Nigeria is concerned, the situational context in has impinged on the effectiveness of the course. Although initially embraced because it focused on the language needs of students in their specific disciplines, today, it is difficult to make any prediction about the future of ESP/EST in Nigeria while learning conditions described above continue to prevail.

Retrieving the ESP/EST course from the margins of the undergraduate academic programme that it presently occupies at FUT, Minna and similar universities has become an urgent matter. However, this would foremost require a policy move that reemphasize the relevance of English language instruction in tertiary education. In the absence of a clear, feasible government policy for language education, even the government agency, Nigerian University Commission, that is charged with the overseeing the quality of university education is handicapped (Adegbiya, 2004:210). As long as the National Education Policy does not specifically describe the position of English in higher education system in Nigeria, the idea of a sustainable implementation of ESP/EST in universities like FUT, Minna becomes a moot point. Hence, the need for periodic reviews that reassess of the usefulness or otherwise of this language learning methodology.

Presently there is an evident disconnection between the English language course and the reality of its status at FUT, Minna as a result of which a more General English approach to language learning is being adopted. Therefore, The Use of English course under which the ESP/EST approach is practiced would greatly benefit from an appropriate learning environment facilitated by the government/university administration. An important step towards repositioning would be to change the "Use of English" title of the course to "English for Science and Technology" that it was first designed to be. Doing this would help to prioritize it for university management, learners, and the new generation of language teachers. There is therefore need for the government to take on the responsibility for ensuring that the language which remains the medium of academic instruction is boosted in terms of adequate funding and other relevant resources in terms of trained teachers and adequate class room space.

It is also critical that language teachers in fully understand the nature as well as the process of language learning. They need to understand the language of specific purpose/disciplines more efficiently and to learn how language instruction can improve students' outcomes in them. For EST practice to be effective, language teachers have to be able to diagnose learners' problems before this alternative teaching technique can efficiently meet the learning requirements of students. Retraining language teachers to sharpen their skills of language analysis would enable



them select how and what to teach using the ESP approach. In addition, their confidence as ESP/EST teachers would grow as they understand their role and learn more about the learners' field of study with support and cooperation of science subject teachers.

### **Conclusion**

The English language retains a strong hold on the dissemination of scientific developments, hence, incorporating it more profoundly into the educational curricula would equip science and technology students in L2 contexts to become effective participants in the discourse communities of their fields of specialties. When adequately supported in terms of government policy, timetable allocation, well trained language and science subject teachers as well as other necessary academic resources, ESP/EST is an instrument that is capable of bringing about much needed economic advancement to a developing country like Nigeria.

The position taken here is that any attempt to make FUT, Minna a world class university of science and technology, requires that more attention be paid to students' use of English. It is therefore important that all stakeholders, government, institutional heads, and teachers of language as well as science/technical subjects reassess the reasons why learners need ESP/EST. Producing learners who are equipped to grasp complex information and articulate their knowledge will enable them to become critical thinkers and problem-solvers who can engage effectively in the creative processes of science and technology. Unlocking and supporting the potentials of the ESP /EST approach is therefore important. However, L2 situations present different challenges, consequently, this approach will need to evolve to meet the very specific needs of learners in specific contexts, hence, reviews such as the one here that examines practice in a specific context will hopefully contribute to future directions for English for Science and Technology.

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