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The effect of Rosetta Stone (computer-assisted language learning) software on English as second language students' proficiency in English language

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ABSTRACT

One of the factors that indicate success in English as Second Language (ESL) classrooms is the proficiency of students in oral communication as a foundation for other language skills. The focus of language education in the 21st Century has moved from traditional knowledge of linguistic forms to using language and cultural knowledge as a means to communicate and connect to others around the globe spontaneously and synchronously. Computer-assisted language learning (CALL) is a growing sector and advocacy in the language instruction area that has huge potential for making the learning of a second or foreign language at both the receptive and productive levels easier and more accessible to teachers and students. CALL technology does not supplant teachers, rather teachers become indispensable; their role is no longer that of mere knowledge transmitters but rather approximates that of a guide or inspector of learners' independent learning. However, though most students have high positive attitude towards the use of ICT in learning English, they are still faced with the problem of lack of proficiency in English and lack of training in ICT. The study therefore sought to determine the impact of Rosetta Stone CALL software on university students' proficiency in English language. A pre-test was administered to a group of students before they were exposed to the CALL software in the faculty's language laboratory. The software comprised five audio files with four thematic units each and one visual file; all these exposed participants to a variety of listening, speaking, reading and writing tasks. An observation schedule was used to monitor and investigate the students' progress. After the intervention, a post-test was administered to the group in an attempt to determine differences in their performance by comparing their pre-test and post-test scores. After the post-test, a structured questionnaire was administered on the students to elicit answers to the research questions. Data were analysed with descriptive and inferential statistical tools such as frequency count, percentage, and t-tests. Results showed that the students' post-test scores were significantly higher than their pre-test scores. This significant difference between the two scores was an indication of the impact of the Rosetta Stone CALL software on improving students' proficiency in English language. Also, questionnaire responses indicated that a great majority of the participating students found the intervention process motivating and interesting, while observation revealed an increase in the students' level of interaction and participation as they exhibited positive learning attitude towards the software. Based on the findings, recommendations are made on the need to adopt computer-assisted language learning in the teaching and learning of English language in various institutions of learning in Nigeria.

Keywords: Computer-assisted language learning, English language proficiency, Rosetta Stone software, ESL classroom.

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INTRODUCTION

With the spread of the English language through information technology, trade and education, it has become the most spoken language world-wide. For instance, over 300 million people speak it as a first

language, and millions more speak it as a second language, while it is official language of over 50 countries (Stone, 2012; Crystal, 1985 cited in Dadzie and Awomusi, 2009; Uzoezie, 2011; Algeo, 2010). One of the factors that indicates success is the proficiency of students' oral communication as the foundation for other skills, whether at the basic, intermediate or advanced levels; thus, the ability of students to articulate simple to complex ideas in English can be determined and improved upon (Hines, 2012).

Language proficiency, according to Yi-Ting and Chen-Chen (2005), is one of the most important factors in international students' success or failure in academic performance. Consequently, most international oversea colleges especially in the UK and US require applicants to show their proficiency in English tests like TOEFL or other tests for admission purpose (Leonshom, 2012).

Thus, the focus of language education in the 21st century is no longer on grammar, memorization and learning from rote, but rather using language and cultural knowledge as a means to communicate and connect with others around the globe (Eaton, 2010). This can be made possible through technological innovations such as internet-based real-time technology that helps learners to produce authentic language by interacting with other speakers spontaneously and synchronously. This is in tandem with communicative approach to language teaching which focuses on what language is used for; and with social and cultural constructivist views which claim that language learning takes place incidentally when learners interact and construct social practices (Gallardo del Puerto and Gamboa, 2009). Thus, the use of Information and Communication Technologies (ICT) in language learning implies Computer Assisted Language Learning (CALL). According to Hines (2012), CALL is a growing sector and advocacy in the language instruction area since it has huge potentials for making the learning of a second or foreign language easier and more accessible to teachers and students. In CALL, technology does not supplant the teachers, rather, they become indispensable. However, their role is no longer that of knowledge transmitters but they approximate the function of a "guide on the side" or inspectors/facilitators of the students' independent learning instead of a "sage on the stage". Consequently, many teachers have used CALL to facilitate their teaching activities. It is also used to reinforce what has been learnt in the class, and as a remedial tool to help learners with limited language proficiency. Proficiency and empowerment of students via ICT enable them to comprehend fully what is taught, to retain and demonstrate same not only in examination but in day to day life (Levy, 1997). If they fail to do so, they are neither empowered nor has their proficiency improved in both oral and written communication.

Generally, most ESL students perceive themselves as having high positive attitude towards the use of ICT in learning English. However, they are confronted with two major problems in this regard, namely, lack of English proficiency and lack of adequate training in ICT (Yunus et al., 2009). Lack of proficiency in English which implies not being competent, good, fluent or knowledgeable in English will be a barrier to learning it using the ICT. Moreover, Davis (2011) discloses that despite the benefit that accrue from the adoption of CALL in teaching and learning the English language via language laboratories and multimedia centres, the use of such facilities has often devolved into rows of students all doing the same drills. This study on the contrary used a combination of face-to-face teaching and CALL (blended learning) to increase the learning potential of the students as advocated by Pegrum (2009). This involved interpretation and discussion which are essential for empowering students and improving their proficiency through seeing, listening, speaking, reading and writing that is, both oral and written language proficiency.

Theoretical framework

The framework for the study is partly built on the behaviourist learning theory and information processing theory. The intervention process of presenting Rosetta Stone CALL software to participants entails the recommended "dynamic immersion" as a direct instructional method where lessons begin with dialogue using a modern conversational style in the target language while the culture (an important aspect of language) is also taught inductively (Mora, 2000).

The study is also hinged on the whole language learning theory (Schutz, 2007) which embraces constructivism and postulates that language learning moves from the whole to the part, rather than building sub-skills to lead towards higher abilities of comprehending, speaking and writing. It emphasizes that comprehending, speaking, reading and writing skills are interrelated, reinforcing one another in complex ways. With constructivist instructional methods (derived from cognitive learning theory), the intervention process involved the learners active participation as they performed tasks in which they "constructed" new knowledge based on their prior experience while the researchers assumed the role of facilitators.

Statement of the problem

Language proficiency is one of the most important factors in international success or failure in academic performance (because learners need the target language to cope with academic activities) (Yi-Ting and Chen-Chen, 2005), and most universities overseas have gate-keeping procedures that ensure the English language proficiency prior to admission of international applicants. Specifically, most international schools in the USA and

UK require Nigerian applicants to demonstrate their proficiency in English through TOEFL, IELTS tests, among others, for admission purpose (Leonshom, 2012). However, many of such applicants may not possess adequate proficiency in English to scale through those tests. The yearly results of Nigerian students in West African Examination O' level English have shown that the yearly pass at the credit level is usually below 50% (2010: 35.13%; 2011: 30.90%; 2012: 38.81% and 2013: 43.03%); and without a credit pass in English, a candidate cannot proceed to any tertiary institution in Nigeria. In addition, the World Bank (2005) stated that Nigerian graduates lack adequate communicative competence to facilitate employability. While the advantages of integrating CALL in overall language teaching strategy are well-documented (Egbert, 2004; Robert, 2004; Yang, 2008; Warschauer, 2002; Alsiede and Pathan, 2013; Warschauer and Kern, 2005), there are still barriers that prevent many educators from fully embracing the benefits. For instance, the availability of relevant software that is applicable to the socio-cultural context of the language classroom may often be difficult to come by (Suharyadi, 2010). The technical proficiency of teachers and learners is yet another problem. There are cases wherein the inability of teachers and/or students to develop adequate proficiency in the use of technology may prevent full integration (Hines, 2012). Also, hesitation by individuals who lack technical skills and theoretical knowledge for using CALL; and institutions that lack adequate ICT facilities, have problems of cost and broadband connectivity to embrace new technology in the process of teaching and learning, affects the process of fully integrating CALL to promote proficiency in English. Hence, the need to enhance students' proficiency in English using CALL becomes evident.

Purpose of the study

The main purpose of this study was to determine the impact of Rosetta Stone CALL software on students' proficiency in English language.

Specifically, the study sought to:

1. Promote proficiency in the participating students' language and communication skills using the Rosetta Stone CALL software(both linguistic and communicative competence)
2. Determine whether the participating students possess technical skills and theoretical knowledge for using Computer-Assisted Language Learning technology.
3. Assess the impact of Rosetta Stone software on the participating students' listening, speaking, reading and writing skills.
4. Determine problem areas encountered by the participants as they uncover aspects of the software.
5. Ascertain the participant's perception of the relevance of Rosetta Stone Software in learning English in Nigeria.

Research questions

The following research questions guided the study:

1. To what extent can the Rosetta Stone CALL software be used to promote proficiency in the participating students' language and communication skills?
2. Do the participants possess technical skills and theoretical knowledge for using Computer-Assisted Language Learning technology?
3. Is there any difference in the participants' listening, speaking, reading and writing performance before and after the intervention procedure?
4. Do the participants encounter problem areas as they uncover aspects of the software?
5. Is the Rosetta Stone software applicable to the socio-cultural context of the Nigerian situation?

Research hypotheses

The following null hypotheses were generated and tested:

1. The Rosetta Stone CALL software is not effective in promoting proficiency in the participating students' language and communication skills.
2. There will be no significant difference between: listening skills scores before and after; speaking skills scores before and after; combined listening and speaking skills scores before and after the intervention.
3. There will be no significant difference between: reading skills scores before and after; writing skills scores before and after; combined reading and writing skills scores and combined speaking and writing skills scores after the intervention.

METHODOLOGY

The study applied a quasi-experimental research design known as one group pre-test post-test. The population consisted of 200 level male and female students, with an average age range of 17 to 21 years in their second semester, from the Department of Arts and Social Sciences Education, of the Faculty of Education, University of Lagos. Thirty-five of them were randomly selected to participate in this research. Data were collected using four research instruments which were duly validated. The instruments were scrutinized for face, content and internal validity by two experts in language education and two language laboratory technicians. A test retest reliability coefficient was used to establish the reliability of the achievement test which stood at 0.87. The instruments are:

1. Rosetta Stone software;
2. Achievement tests;
3. Observation schedule;
4. Questionnaire.

Research procedure

In order to help control "relevant factors of the intervention", learning experiences took place in the faculty's language laboratory via face-to-face teaching, with the assistance of the laboratory technician and a computer engineer. Data from pre-test and post-test scores were obtained from the thirty-five participating students.

First, the researchers guided the students in a refresher course to determine and reinforce their prerequisite knowledge on language and communication skills. Next, a pre-test was administered to determine the students' entry behaviour for the present learning experience. The test items consisted of objectives and open-ended questions. After this, the students were introduced to the course content of the software. The intervention procedure was carried out in seven stages:

Stage 1

The participants were introduced to lesson one of the software's audio file consisting of four units: language basics, greetings and introductions, work and school, and shopping. Since each unit lasts for a minimum of one hour, the students were required to simply listen to simulated conversation of the native speakers in order to determine constraints encountered while pronouncing vocabulary items which they were already familiar with. After the listening exercise, the students were given exercises based on the units to attempt. These exercise items were duly graded and recorded by the researchers in the observation schedule.

Stage 2

The four units of the audio file of lesson two, namely: travelling, past and future events, friends and social life, and dining and vacation were presented to the participants to build on the vocabulary and pronunciation in level one and to practice grammatical structures contained in the units. They also wrote at their own pace, putting down words, phrases and sentences from the conversations in the unit topics, indicating the syllables and stress patterns of the words. At the end of this exercise, the participants, with the aid of the dictionary, were encouraged to critique their performance while taking note of errors and making corrections. The researchers duly recorded each student's performance in the observation schedule.

Stage 3

Participants were presented with level three of the audio file which consisted of four units of home and health, life and world, everyday things, and places and events. Each student was encouraged to repeat the exercise in stage two before going further to transcribe the words they had put down in their notebooks. The written words based on unit three were transcribed based on the native speaker's pronunciation in a simulated conversation. At the end of this exercise, the researchers guided the participants in the process of grading their performance with the aid of the dictionary. The participants' grades were recorded in the observation schedule. As an assignment, each participant was given exercises to perform; they recorded their voices via recording devices of phones and laptops, taking precautions to record in a conducive environment, free of noise. They either read from written materials or made up impromptu speeches. These recordings were scrutinized by both the individual students and the researchers to root out technical errors or otherwise (if any) after which their individual performances were graded and subsequently, recorded in the observation schedule.

Stage 4

At this stage, the participating students were introduced to the four units of the fourth level comprising units on tourism and recreation, professions and hobbies, home and around town style, and personal wellness. Exercises on sub-topics of pronunciation, vocabulary, stress, and syllables were carried out by the participants. Students were expected to transcribe and place emphatic stress where required. These exercise items were duly graded and recorded by the researchers. Corrections were then made as students consulted the dictionary.

Stage 5

The four units of level five, that is, the audio file on business and industry, arts and academics, emergency situations, and family and community were presented to the students alongside their own prior recordings of same. The participants were expected to digest the audio files concurrently in order to make comparison between their pronunciation and that of the native speaker. Another exercise was assigned and attempted as homework by the participants whose performances were graded and recorded in the observation schedule by the researchers. In stages 1 to 5, participants' interaction with the simulated conversations and with one another was evident.

Stage 6

At this stage, individual participants were encouraged to read each visual file as the researchers used a stopwatch to record their reading speed. Having read the assigned unit, participants were given instructions to write their perceived theme and summary of the unit they had just read. With the aid of their notebooks, they were further required to write a composition on the theme. This stage spanned for the duration of five days. All the units of activities in the audio files used in the six stages of the intervention were adopted from the Rosetta Stone software.

Stage 7

Finally, the participants were given post-test exercises to determine any significant difference in their language skills after the exposure to the software. Students' individual scores from both the pre-test and post-test exercises were recorded and placed side by side to determine the gains in performance, if any.

The observation schedule containing checklist items were ticked when certain intended learning traits were observed in the participants' language skill(s). A questionnaire was then administered to the participants who were encouraged to tick the appropriate items applicable to them. Data collected from the participants were presented in tables where they were calculated before interpretations were provided by the researchers. Participants' grades in both the pre-test and post-test exercises on the four language skills were also calculated to determine the mean scores in each skill. Research questions were fully analysed with descriptive statistics while inferential statistics were applied to test the research hypotheses.

RESULTS

Observation in the language laboratory

As regards observation in the language laboratory, data

were grouped based on different language skills.

According to the data presented in Table 1, the overall mean score of the participants indicated above-average performance in all but one element of extensive listening, and above-average performance in all the elements of communicative competence. As regards reading skill, data presented indicated their highest speed on day one which subsequently declined on day 2, declined further to an average of 144.5 wpm on the third and fourth day but increased on the fifth day to an average of 154.5 wpm. The students' rate of comprehension was at an average of 57 wpm for the first three days after which it increased on day 4 to an average of 62 wpm. On the fifth day, their comprehension rate showed some increase at the rate of 65 wpm. Generally, their reading speed was quite poor while the comprehension rate was fairly good.

Data collected to determine the students' mean score in composition was rated as fair for the first three days. On days 4 and 5, these students' performance experienced some improvement as their mean score was rated as good. In summary writing, data collected showed that the students' mean score was rated as fair on days 1 and 2, while the last three days experienced some enhanced performance as their mean score was rated as good.

Data presented in Table 2 showed an increase in the post-test mean score on the listening skill from 5.31 to 6.11 making a difference of 0.80, and an increase from 5.20 to 6.20 making a difference of 1.00 in the speaking skill. Minimal differences were recorded in the two literacy skills as the reading skill attracted an increase of 0.15 and the writing skill had an increase of 0.26. Overall, the pre-test and post-test mean scores in the four language skills depicted a difference of 2.23 in favour of the post-test scores. Hence, there is a difference in the students' language skills before and after the intervention.

Responses to research questions

Table 3 shows the students' opinions on the extent Rosetta Stone Software impacted their performance in the four language skills.

Based on the data collected from the participants' responses, 42.9% were of the opinion that the Rosetta Stone software integrated the four language skills into various tasks to a moderate extent while 40% held the opinion that this integration was to a high extent. As regards the extent the various tasks had enhanced their ability to listen and understand utterances via the audio files, 40% indicated to a high extent and 45.7% disclosed to a moderate extent while the question regarding the extent the software had enhanced their ability to speak fluent English was answered with a majority of 42.9% disclosing that it was to a moderate extent. 51.4% were of the opinion that the tasks had enhanced their ability to rapidly read and comprehend written text to a moderate extent, while 40% held the opinion that the variety of exercises which they had been exposed to had enhanced their ability to summarize and write compositions in grammatically acceptable writing to a high extent.

Based on the number of occurrences, it is obvious from the wide margin that a great majority of the respondents were familiar with the monitor, mouse, keyboard and CPU, but only few were familiar with other hardware devices like the buffer, joystick, webcam, scanner and printer (Table 4).

According to the tabular presentation and analysis of the participants' notebook entries, the problems students encountered fell under the following categories: Conversational skills, Accent, Level of confidence, Retention rate, Customisation to language variations, Variety, Simplicity, Explanations, Bulk, Portability, Humour, and Consistency in level of difficulty (Table 5).

From the data in Table 5, it is evident that 97.1% of the participants had problems with the bulky nature of the software. Similarly the participants experienced a high level of difficulty with the software's accent (speech/voice – recognition software) as stated by 82.9% of them, while 14.3% seemed to lose whatever preconceived notion of their level of proficiency in English after being exposed to the software.

As regards portability and simplicity of the software, 11.4% registered problems, as the affected students neither had a portable recording device for effectively transferring some audio and visual files to explore at neither a convenient time, nor the patience for "unnecessary repetition" as some wrote down when certain exercises seemed to recur at some later part of the software.

With regard to conversational skills, 34.3% wrote down that they either had problems with speaking to an inanimate object or when they did try to carry on a conversation, they either got corrected almost every time making the entire exercise strangely exciting and at the same time frustrating. Despite its repetitive nature, 22.9% of the group seemed to have issues in their ability to remember some previous experiences they had earlier come across, hence, the problem of retention rate.

As regards the software's customisation to language variations, 48.6% were of the opinion that its attempt to inculcate various language variations was flawed. Despite the presence of games, 31.4% of the participants found some aspects of the procedure humourless while 37.1% had reservations towards the software's lack of consistency in level of difficulty. Based on explanations on various units, 17.1% felt that more explanations would have made the exercise easier. 51.4% were of the opinion that the level of variety turned out to be a problem as some of them just could not seem to keep up the pace.

Based on the Likert-type scale response, 94.3% of the respondents were of the opinion that the software was effective in promoting English language learning in

Table 1. Summary of students' performance in listening, speaking, reading and writing.

Extensive listening	**Excellent (60 & Above)**	**Very good (55 - 59)**	**Good (50 - 54)**	**Fair (45 - 49)**
Pronunciation		✓		
Lexis/vocabulary			✓	
Grammatical structures	✓			
Style			✓	
Culture of target language				✓
General knowledge		✓		
Oral communicative competence	**Excellent (60 & Above)**	**Very good (55 - 59)**	**Good (50 - 54)**	**Fair (45 - 49)**
Intonation		✓		
Stress	✓			
Pronunciation			✓	
Reading speed	**Excellent (170 wpm & Above)**	**Very good (160 - 169 wpm)**	**Good (150 - 159 wpm)**	**Fair (140 - 149 wpm)**
Day 1	✓			
Day 2		✓		
Day 3				✓
Day 4				✓
Day 5			✓	
Rate of comprehension rate	**Excellent (65 wpm & Above)**	**Very good (60 – 64 wpm)**	**Good (55 – 59 wpm)**	**Fair (50 – 54 pm)**
Day 1			✓	
Day 2			✓	
Day 3			✓	
Day 4		✓		
Day 5	✓			
Written composition	**Very good (15 & Above)**	**Good (10-14)**	**Fair (5-9)**	**Poor (4 & Below)**
Day 1			✓	
Day 2			✓	
Day 3			✓	
Day 4		✓		
Day 5		✓		
Summary Writing	**Very Good (15 & Above)**	**Good (10-14)**	**Fair (5-9)**	**Poor (4 & Below)**
Day 1			✓	
Day 2			✓	
Day 3		✓		
Day 4		✓		
Day 5		✓		

Table 2. Participants' pre-test and post-test mean scores in the four language skills.

No.	Skills	Pre-test mean scores	Post-test mean scores
1.	Listening skill	5.31	6.11
2.	Speaking skill	5.20	6.20
3.	Reading skill	5.66	5.83
4.	Writing skill	6.03	6.29
	Total	22.20	24.43

Table 3. Students' responses based on the extent Rosetta Stone can be used to promote proficiency in students' language skills.

No.	Questions	Response type			
		Very high extent	High extent	Moderate extent	Low extent
1.	To what extent does the Rosetta Stone software integrate the four language skills into various tasks?	4 (11.4%)	14 (40%)	15 (42.9%)	2 (5.7%)
2.	To what extent do these tasks enhance your ability to listen and understand utterances made by the native speakers via the audio files?	2 (5.7%)	14 (40%)	16 (45.7%)	3 (8.6%)
3.	To what extent do the tasks enhance your ability to speak English fluently while taking cognisance of pronunciation?	10 (28.5%)	3 (8.6%)	15 (42.9%)	7 (20%)
4.	To what extent do the tasks enhance your ability to rapidly read and comprehend written text?	1 (2.9%)	13 (37.1%)	18 (51.4%)	3 (8.6%)
5.	To what extent does the variety of exercises which you have been exposed to enhance your ability to summarize texts and write compositions in grammatically acceptable writing?	3 (8.6%)	14 (40%)	11 (31.4%)	7 (20%)

Table 4. Students' responses on their familiarity with computer hardware devices.

No.	Hardware Devices	Number of occurrences
1.	Monitor, Mouse, Keyboard	28
2.	Central Processing Unit (CPU)	25
3.	Uninterrupted Power Supply (UPS)	6
4.	Disc Drive	6
5.	Random Access Memory (RAM), Hard Disc	4
6.	CD/DVD Read Only Memory (ROM)	3
7.	Scanner, Printer, Webcam	2
8.	Buffer, Joystick	1

Nigerian institutions of learning. Also, 97.1% held the opinion that the software could improve the Nigerian student's ability to listen and speak fluently in the English language while 2.9% believed otherwise. 94.3% of the respondents believed that the software could improve students' ability to read rapidly and write legibly, while 5.7% were of contrary opinion. A majority of 91.4% of the respondents held the opinion that Rosetta Stone is adequate for the Nigerian university system. As regards the applicability of the software to the Nigerian socio-

Table 5. Problem areas students encountered as they uncover the software.

No.	Problem areas	No. of respondents	%
1.	Conversational skills	12	34.3
2.	Accent (speech/voice-recognition software)	29	82.9
3.	Level of confidence	5	14.3
4.	Retention rate	8	22.9
5.	Customisation to language variations	17	48.6
6.	Variety	18	51.4
7.	Simplicity	4	11.4
8.	Explanations	6	17.1
9.	Bulk	34	97.1
10.	Portability	4	11.4
11.	Humour (games)	11	31.4
12.	Consistency in level of difficulty	13	37.1

Table 6. Participants' responses on the applicability of the software to the socio-cultural context of the Nigerian situation.

No.	Questions	Response type				Total
		SA	A	D	SD	
1.	The software can be effective in promoting English language learning in Nigerian institutions of learning.	14 (40%)	19 (54.3%)	2 (5.7%)	0	35 (100%)
2.	Rosetta Stone can improve the Nigerian student's ability to listen and speak fluently in English language.	12 (34.2%)	22 (62.9%)	1 (2.9%)	0	35 (100%)
3.	Rosetta Stone software can improve the Nigerian student's ability to read rapidly and write legibly.	13 (37.2%)	20 (57.1%)	2 (5.7%)	0	35 (100%)
4.	The software is adequate for the Nigerian university system.	12 (34.3%)	20 (57.1%)	3 (8.6%)	0	35 (100%)
5.	The software is fitted to the Ni Nigerian socio-cultural context.	2 (5.7%)	15 (42.9%)	17 (48.5%)	1 (2.9%)	35 (100%)

cultural context, 48.6% answered in the affirmative, 48.5% held contrary opinions while 2.9% held strong contrary opinions (Table 6).

Testing of hypotheses

Hypothesis 1: The Rosetta Stone CALL software is not effective in promoting proficiency in the participating students' language and communication skills.

As shown in Table 7, At both 0.05 and 0.01 levels of significance, the calculated value is greater than the critical table values α (1 tail), hence, there is a significant difference between the pre-test and post-test scores of the participants. Since t.cal (2.67) is greater than t.tab (1.6909) and (2.4411) at 0.05 and 0.01 levels of significance respectively, the alternative hypothesis was accepted, hence, the Rosetta Stone CALL software is effective in promoting proficiency in the participating students' language and communication skills.

Hypothesis 2: There will be no significant difference between:
(i) Listening skills scores before and after the intervention
(ii) Speaking skills scores before and after the intervention
(iii) Combined listening and speaking skills scores before and after the intervention

Table 8 shows that there was a significant difference between pretest scores before and after intervention with regard to listening skills ($t = 2.64$, df: 34, $p < 0.05$). The null hypothesis stated was, therefore, rejected. Similarly, there was a significant difference between pretest scores before and after intervention in the case of speaking skills

Table 7. Overall students' performance in the pre-test and post-test.

Variables	N	Mean	S. D.	D. F.	T. Cal.	T. Critical (0.05)	T. Critical (0.01)	Remarks
Pre-test	35	22.20	5.39	34	2.67	1.6909	2.4411	Significant
Post-test	35	24.43	4.87					

Table 8. Paired sample t-test of listening and speaking skills.

Variable	Level	N	Mean	SD	Df	t-value	Sig.	Decision
Listening	Posttest	35	6.11	2.11	34	2.64	0.013	Significant
	Pretest	35	5.31	2.23				
Speaking	Posttest	35	6.20	2.23	34	2.66	0.012	Significant
	Pretest	35	5.20	2.23				
Listening-Speaking	Posttest	35	12.31	3.45	34	3.74	0.001	Significant
	Pretest	35	10.51	3.70				

Significant at $p < 0.05$.

Table 9. Paired sample t-test of reading and writing skills.

Variable	Level	N	Mean	SD	Df	t-value	Sig.	Decision
Reading	Posttest	35	5.83	1.84	34	0.62	0.539	Not Significant
	Pretest	35	5.66	2.00				
Writing	Posttest	35	6.29	1.93	34	0.91	0.368	Not Significant
	Pretest	35	6.03	1.77				
Reading - Writing	Posttest	35	12.11	3.02	34	1.01	0.320	Not Significant
	Pretest	35	11.69	2.91				
Speaking - Writing	Posttest	35	12.49	2.00	34	3.66	0.000	Significant
	pretest	35	11.23	2.08				

Significant at $p < 0.05$.

($t = 2.66$, df: 34, $p < 0.05$). Also, the null hypothesis earlier stated was rejected. The combined listening and speaking skills scores after the intervention was significantly different from the combined scores before the intervention as shown in Table 8 ($t = 3.74$, df: 34, $p < 0.05$). The null hypothesis was also rejected.

Hypothesis 3: There will be no significant difference between:
(i) Reading skills scores before and after the intervention
(ii) Writing skills scores before and after the intervention
(iii) Combined reading and writing skills scores before and after the intervention

Table 9 indicates that there was no significant difference between pretest scores before and after intervention with regard to reading skills ($t = 0.620$, df: 34, $p > 0.05$). This implies that the null hypothesis stated was not rejected. In the same vein, there was no significant difference between pretest scores before and after intervention in the case of writing skills ($t = 0.912$, df: 34, $p > 0.05$). Thus, the null hypothesis earlier stated was not rejected. The combined reading and writing skills scores after the intervention was not significantly different from the combined scores before the intervention as shown in Table 9 ($t = 1.009$, df: 34, $p > 0.05$). The null hypothesis was also not rejected. The table also showed that there was a significant difference between pre-test scores and after the intervention scores with regard to a combination of speaking and writing skills ($t = 3.66$, df: 34, $p < 0.05$). This implies that the null hypothesis stated was rejected.

DISCUSSION

During and after the intervention, test, questionnaire and observation techniques were used to investigate the effectiveness of Rosetta Stone CALL software on the participating students' language and communication skills. The researchers found the following results: Observation in the language laboratory, throughout the intervention process, revealed an increase in the level of student-interaction and participation while corresponding data revealed that the students' performance indicated some increase in the various elements of the listening and speaking skills, speed and comprehension rate as well as composition and summary writing after being taught with the Rosetta Stone CALL software. This finding is consistent with the findings of previous studies on CALL on the four language skills (Dreyer and Nel, 2003; Kawaguchi and Di Biase, 2009; Wang and Munro, 2004) cited in Shafaei (2012).

Findings from the questionnaire showed that the students exhibited positive learning attitude towards CALL leading to improved performance in the English language after studying with the software. The possible reasons for the positive attitude to the software are the high motivation, experiential and interactive learning involved, and flexible and independent learning associated with the network-based technology language learning. The self instruction and feedback also enhanced their excitement and self confidence. This is in line with Bulut and Abuseileek's (2007) findings which revealed that students who participated in a study on "Learner attitude toward CALL and level of achievement in basic language skills" had a positive attitude toward CALL in general while using CALL for learning the four language skills.

As regards the testing of hypotheses, the first hypothesis sought to determine how significant the difference was in the pre-test and post-test scores of the group in the four language skills using the t-test statistical formula for one sample mean. The results revealed that the post-test scores were significantly higher than those of the pre-test showing students' improvement in English proficiency level after undergoing the intervention procedure. This is in line with the claim that "the award-winning self-study software, complete with proprietary speech-recognition technology, enables students to learn to speak, understand, read and write" (Stone, 2012; Suharyadi, 2010).

The second hypothesis sought to compare how significant the difference was between pre-test and post-test scores of the group in the listening and speaking skills. The results showed that the participants' achievement in the post-test was significantly higher than that of the pre-test. This significant difference between the two scores was an indication of the effect of the Rosetta Stone CALL software on improving the students' listening and speaking skills. This finding is consistent with other studies that investigated the effect of CALL on learning the English language (Hartoyo, 2006; Roberts, 2004; Felix, 2008; Alsied and Pathan, 2013).

The third hypothesis sought to compare if the difference between the participating students' pre-test and post-test scores in the reading and writing skills was significant. The results revealed that the difference between these students' pre-test and post-test scores in the two literacy skills was not significant. This corroborates Sadker and Sadker (1994) and Bulut and Abuseileek's (2007) findings which revealed that sometimes, there was no significant difference in students' achievement in some aspects of English regardless of treatment.

Overall, the first two null hypotheses on Rosetta Stone's impact on the promotion of proficiency in English language were rejected while the third was accepted.

CONCLUSION AND RECOMMENDATIONS

Computer-Assisted Language Learning has prompted a major reconsideration in the education sector in terms of both teaching and learning methods as well as in the learning environment. It has emerged as a tempting alternative to traditional modes of supplementing or replacing direct student-teacher interaction, such as the language laboratory or audio-tape-based self-study. Therefore the need to encourage such independent language learning cannot be overemphasized.

Based on the results of the study, the following recommendations are hereby made:

1. English language teachers should be keen to discern the most appropriate approach to teach English to Nigerian learners in order for their English performance to meet the international demands, and enable them to fully and successfully participate in the international community, hence, the need to adopt ICT in English language teaching.
2. To maximise the benefits of existing CALL programmes or materials, teachers and students need to be informed about the options of the implementation and application of CALL and how CALL can be integrated into Nigerian teaching and learning context, through workshops, seminars and enrichment of curriculum content.
3. Students should be encouraged to use the computer for learning outside the classroom and language laboratory. While surfing the World Wide Web via the Internet, they can gain access to various CALL programmes which could be used to improve on their language skills. They could be directed to some credible and relevant websites that promote the teaching and learning of English especially for ESL learners so that they would continue to practise the language independently. Such sites may include:

www.UsingEnglish.com; www.britishcouncil.com; www.esl.about.com; www.soundofenglish.com; www.talkenglish.com, among others.

4. As regards the Rosetta Stone software, various aspects of the software could be updated and modified to suit the mental age and the ability of the Nigerian learner as well as the Nigerian socio-cultural context. Hence, institutions of learning should spare no expense in the procurement and update of CALL software packages which are culturally relevant to the Nigerian situation, such as the pictures that are culturally relevant, using speakers who exhibit neutral accent easily understood by all, especially the British accent Nigerians are familiar with.

5. Finally, more awareness should be created on the need to adopt Computer-Assisted Language Learning in various institutions of learning in Nigeria in order for the students to be at par with their counterparts worldwide.

Limitations of the study

The study sample was limited to thirty-five (35) second year students of one department in one university, thus the results may not be generalized to all higher education institutions in Nigeria. Future research is needed to investigate the effects of other CALL software packages, while a larger sample in other contexts could also be used for similar studies.

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