IMPACT OF INSTRUCTIONAL OBJECT BASED GAME ON THE PERFORMANCE OF SENIOR SECONDARY SCHOOL 2 (SS 2) STUDENTS IN LEARNING ENGLISH LANGUAGE MORPHEMES

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ABSTRACT: *The effectiveness and efficiency of using Instructional Object Based Game (IOBG) in teaching and learning English language morphemes was investigated. Two research questions guided the study. The study was a pre and posttest equivalent control group design which employed a sample of 200 senior secondary schools 2 (SSS 2) students drawn from 20 co- educational schools within Lagos Island and Eti – Osa educational zones of Lagos state, Nigeria. Morphemes Instructional Object Based Games (MIOBG) and English Language Achievement Test (ELAT) were constructed and validated with coefficient of internal consistency of .89 and .86 respectively. Mean standard deviation and analysis of covariance (ANCOVA) were used to answer research questions. The findings showed that: MIOBG was found to be significantly more effective in facilitating teaching morphemes (in English language vocabulary building) than conventional (traditional) method of teaching. No significant difference existed between the performance of male and female students taught with MIOBG and conventional method. Suggestions were made by encouraging teachers in using games to teach.*

KEYWORDS- Object Based games, morphemes, learning instruction and gender.

INTRODUCTION

Students' learning skills of second language depend on their exposure to adequate instruction materials, teaching experience on the part of the teachers and beliefs about the second language learning (Ellis, 1994). Studies showed that individuals learning a language have specific method on how they can acquire such language among which are concepts mapping, gaming strategies and approaches that enable them to learn the language (Folse, 2004 & Hinkel, 2005).For many years instructional games such as OBG have been used to support student learning at various levels of education. Yet, despite studies that showed the potential of OBG to promote and facilitate student learning, many still contend that insufficient data invalidate the contributions of OBG to student learning. The results of most studies in the area of instructional design and game technology were considered too fragmented, insufficient and unsystematic (Condie & Munro, 2007). The evidences for the adoption of OBG and game technology are insufficient that using OBG positively within the classroom practice affects teaching and learning. Thus, there is need for better and more

empirical evidence of the impact of OBG on the performance and academic achievement of learners (Miller & Robertson, 2010).

In other to provide additional empirical evidence on the use of object based game in teaching and learning morphemes in English language vocabulary building. This study sets to design an instructional Object Based Game (OBG) to teach morphemes and investigate whether game (OBG) facilitates learning in SS2 English language and to explore the aspect of game design that support student learning in English language. It was reviewed in research literature that explores how OBG influence students learning go a long way to expand learning horizon (Chandra and LIoyd, 2008). An OBG was developed using design principles generated from the review literature. Two quantitative studies were identified using the OBG (morphemes game) and a paper based test on traditional method of teaching morphemes. The studies were of the same learning content and pedagogical objectives in other to explore the impacts of OBG on student learning.

LITERATURE REVIEW

What Is A Morpheme?
According to Katamba and Stonham (2006) a morpheme is the smallest, indivisible unit of language that carries semantic content and grammatical function words. This means that a morpheme cannot be divided into smaller units which are meaningful by themselves or mark any grammatical function. A morpheme therefore, has internal stability since nothing can be interposed in a morpheme. It is also externally transportable or has a positional mobility or free distribution, occurring in various contexts. For-instance the word **builder** consists of two morphemes. **Build** (with the meaning to construct.) and **–er** (which indicates that the entire word functions as a noun with the meaning one who builds). Similarly the word **houses** is made up of the morphemes (with the meaning of dwelling) and **-s** (with the meaning of more than one).

Some words consists of single morpheme. For-instance the word **desire** cannot be divided into smaller parts that carries information about meaning and function. Such words are called simple words. However, words that contain two or more morphemes are called complex words.

Table. 1

Simple and Complex Words

ONE MORPHEME	TWO MORPHEMES	THREE MORPHEMES	MORE THAN THREE MORPHEMES
Child	Child-ish.	Child-ish-ness	
Boy	Boy-s	Un- break-able	
Hunt	Hunt-er	Hunt-er-s	
Act	Act-ive	Act-iv-ate	Re-act-iv-ate
Man	Gentle-man	Gentle-man-ly	Gentle-man-li-ness

Classification of Morphemes
Morphemes can be classified as either free morphs or bound morphs. These categories are mutually inclusive and as such a given morpheme will belong to exactly one of them. Free morphemes function independently as words. For-instance dog, cat, town, house and can appear with other

lexemes. A free morph is always a root. That is, it carries the principal lexical or grammatical meaning. It occupies the position where there is the greatest potential for substitution. It may attach to other free morphemes or bound morphemes. Bound morphemes appear as parts of a word and always attached to the root or base of the word. Bound morphemes include **-ish ,-able, -ness, -ly, -trans, -un**, **-s** .Some of these morphemes occur before other morphemes and are called prefixes. In English, examples of such morphemes are: **re-do, trans-portation, im-possible, em-power, un-safe**. Other morphemes occur only as suffixes or after other morphemes.   English examples of such morphemes are: child-ish, **break-able.** These prefixes and suffixes morphemes are called bound morphemes because they can -not occur unattached.

Identification of Morphemes
Katamba and Stonham (2006) observe that the manifestation of a morpheme can be recognized at a level of a morph (the actual segment of a word). Morphs are represented by word forms or phonetic forms. A morpheme is realized as a morph. Morphemes can be identified through meanings or physical form.

Table 2.   Prefixes and Suffixes used in MOBG.

Prefixes	Meaning	Examples	Suffixes	Meaning	Examples
Re-	Again	Re-do ,re-try	-ette	Smaller in size	Kitchenette, cigarette
Post-	After	Post-pone	-Iy	In a certain way	Love-ly
Trans-	across	Trans-africa	-ity	State of being	Clar-ity
Pre-	before	Pre-school, prewar	-less	without	Help-less, hope-less
Mis-	Left out, not accurate	Mis-kick, mis-judge.	-ness	Having a state or condition	Kind-ness, good-ness
Ex-	former	Ex-wife, ex-Minister	-er	Someone who does something	Play-er, call-er, work-er
Un-	Not as	Un-just, un-safe			

Morphemes help us to identify the parts of speech of words, for instance suffixes can be used to tell the' part of speech of the word nouns-ance -ful -ity -ness-tion and the plural morpheme ending (-s) for-instance **perfom-ance, cla-rity, rend-ition, dog-z, white-ness.**
Verbs ate as in **participate, obfuscate.**
Adjectives-able-ly-less **as in breakable, lovely, careless.**
Adverb -ly **lovely.**
In linguistics, any physical form that represents a morpheme is called morph. For- instance -ish, **-less**, **-ed, -er, -re**, -**un, -ex** are morphs .Morphological analysis of a morpheme begins with the identification of morphs, that is forms which carry some meaning or associated with some grammatical function. Morphs that realize the same morpheme are referred to as allomorphs of that morpheme. In English the indefinite article is a good example of a morpheme with more than one allomorphs. It is realized by the two forms **a** and **an.** The sound at the beginning of the following word determines the allomorph that is selected . If the word following the indefinite

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article begins with a consonant, the allomorph a is selected, but if it begins with a vowel the allomorph an is used instead. For- instance:

A dictionary,   A boat,   An apple,   An island.

Allomorphs of the same morpheme are said to be in complementary distribution when they do not occur in the same environments and therefore can- not be used to distinguish meanings. So, because **a** and **an** both realize the same indefinite article morpheme, it is impossible to have both in these sentences:

I gave Kola a book.

I gave Kola an dictionary. [wrong]

Apart from meaning, the identification of morphemes is based on the notion of distribution, that is, the total set of contexts in which a particular linguistic form occurs. A set of morphs are classified as allomorphs of the same morpheme if they are in complementary distribution. Morphs are said to be in complementary distribution if:

1.   they represent the same meaning or serve the same grammatical function.
2.   they are never found in identical contexts.

So the three morphs/-id/, /-d/ /-t/ which represents the English past tense morpheme are in complementary distribution. The past tense of regular verbs in English is spelled -ed and realized in speech by /id/, /d/ or /t/. The phonological properties of the last segment of the verb to which it is attached determines the choice. Each morph is restricted to the following context.

1.   /-id/ is realized when the verb ends in /d/ or/t/. Paint   painted, Mend   mended
2.   /d/ is realized after a verb ending in any voiced sound except /d/ Clean   cleaned, Weigh weighed
3.   /t/ is realized after a verb ending in any voiceless consonant other than /t/ Park   parked,   miss   missed

Morpheme game and learning

Learning in this context refers to an individual's active construction and building of English language word(s) using gaming process. It involves every learner's "own knowledge" by integrating new guises and information from the game with previous experience. These were in line with the view of researchers in the learning progression field. This field proposed that, learners have different personal and cultural experiences, they can therefore follow many paths in English language patterns as they move from novice toward expert understanding (Shin, Stevens & Krajcik, 2010).

Sutherland, Shin & McCall (2010) opine that, given the same learning goals and contexts, different students learn in different ways in classroom environment while using game. Games differ in the way they (learners) perceive, comprehend information and require varying approaches and different ways of understanding content. The conventional (traditional) method of teaching is limiting in meeting the challenges of diverse learners. Because this method is basically teacher centred, it involves "chalk-talk and talk-talk". Learners have limited contribution, too monotonous and creates unnecessary convergent view of solving and arriving at issues and answers respectively (Olatoye, Nleya & Batane, 2013).

Wagner (1994) was of the view that individuals (Learners) construct a variety of internal developmental processes when interacting with others while using OBG (as teaching tool) in a

learning environment. The functionality of learner control in gaming facilitates and interaction between the learner and the game facilitates learning. This serves as a major factor for creating an individualized learning environment to promote and facilitate student learning and understanding of the context (Kahvec & imamoglu, 2007). The response of learners to a particular issue or content depends on difficulty level of the content and activity based on individuals learners' ability level, task goals and game strategies (kinzie & Joseph, 2008). Eck, (2006) was of the view that learner's control content taught depends on subject matter mastery, motivation and positive attitude toward learning activities in which game facilitates.

Game process enhances motivation and provides feedback and support to the learners in reaching set goals. The feedback is done based on the students correct or incorrect answers on the number of correctly solved problems and word formation (Wagner 1994). Research suggests that game improves students performance in reading comprehension, spelling and decoding of grammar (Brinton, 2000).

MORPHEME GAME

Figure 1. Morpheme Game

Game Model

Sample spaces of dice were used to tag prefixes, suffixes or letters such as; $1,1^{at}$, $5,5^{ette}$, $2,5^{end}$, $2,2^{ch}$, $3,4^{ly}$, $6,4^{s}$, $ent^{4,6,}$ · The sample space on the game (MOBG) see Figure 1 shall be used by the player(s) to form morphemes.

MOBG Rules

(1) *Procedure for play*

Throwing the dice gives the player(s) the opportunity of a starting morph, prefixes or suffixes. Example:

When the dice are thrown and the numbers 2 and 4 (2,4) appear then my starting morph is TH depend on mastery of words.. Though in this game, a player has chances of forming words with the use of given letters from dice faces between, before or after the word formed.

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Examples: dice faces 4,4 and 1,3 give words like;

Apple	hapless	gap	umpire	spume	stratum
approve	happen	map	umpteen	slumber	datum
appoint	haphazard	pap	umbrella	number	sternum

(2) A player will use the letter(s) T or Ig or x or z to form a word if a die or both dice are lost in the cause of throwing them.

Scoring Procedure

When a player uses a letter or morph from the faces of dice thrown to make a word he earns 2 points. If/he/she uses same dice faces to form two morphemes earns 4 points, three morphemes earns 6 points. A morph therefore stands for 2 points. Examples

at$^{1.1}$: attend has two morphs at _ tend while fate and mat have one morph.

end$^{2.5}$: endanger has two morphs end_ anger while attendant has three morphs at _ tend _ ant while send has one morph.

Limitations of the Previous Studies

The previous studies reviewed in the earlier discussions had given the researchers some ideas and basic knowledge about the use of game in teaching and learning second language. However, one of the limitations of the previous studies was the fact that there is no study which has empirically investigated students learning achievement using textual or Instructional Object Based Game. Previous studies have only concentrated on the use of one of the methods, individually in their studies which were solely on descriptive processes rather than experimental. This current study adopted quasi experimental research design by dividing the selected subjects (using random sampling) into experimental and control groups.

Purpose of the Study

The main purposes of this study was to firstly, design Instructional Morpheme Object Game (IMOBG) using TPACK principles to investigate the extent or degree of influence the morpheme game has on the performance of SS 2 students in English language vocabulary building and secondly to investigate the impact of IOBG on students learning of morphemes in the SSS 2 classroom using some quasi experimental design. The study will also assess, if there exist any gender differences among the group treated with the game. The study has therefore identified the following research questions:

Research Questions

1. To what extent do the mean scores of students treated with MIOBG (MORPHEME GAME) techniques influence English language vocabulary building vary from students using traditional method of learning morphemes?
2. What is the effect of gender composition of students exposed (treated) with MOBG and those treated with traditional method of learning morphemes?

Research Design

The study is a quasi-experimental pretest-post test control group design.

METHODOLOGY

Pilot Study
Forty senior secondary school students were sampled using convenience and availability sampling method. The subjects sampled were divided into equal parts for pre test, the first part was treated with MIOBG and the second part was treated with English Language Achievement Test (ELAT). The performance was rated to determine its reliability. Cronbach alpha was used to determine the reliability of the instruments, since the items in the instruments are not scored simply as right or wrong. The alpha coefficient of .89 MIOBG shows a high level of reliability (Fraenkel & Wallen, 2003). The alpha coefficient of .86 of ELAT also showed a high level of reliability.

Participants
The population of the study comprised the senior secondary two (SS 2) English language students found in the 20 co-educational schools within Lagos Island and Eti-Osa Educational Zones of Lagos State, Nigeria. The study employs purposive and convenience sampling to select 200 SS 2 English language students selected from 20 schools that is from 2 educational zones in Lagos State. Multi stage random sampling was used to avoid interclass mixed, 100 subjects were selected from 10 schools in each educational zone area using 50% proportionate on each zone and stratified simple random sampling technique was adopted to give non mixed schools within the zones equal chance of being taken. 100 subjects were assigned to each group experimental group (A) and control group B (traditional method).

Instruments
English Language Achievement Test (ELAT) and MIOBG were constructed and used for the study. The ELAT was a 30 item achievement test designed based on the linguist that represents morphological analysis begins with the identification of morphs that is; forms that carry some meaning and grammatical functions. The reliability of ELAT was established using Kuder Richardson formula 21 found to be .86. Morpheme Instructional Objects Based Game (MIOBG) was constructed with the reliability using Cronbach's alpha to be .89 and has the same morphological analysis, identification of morphs and some grammatical functions with ELAT.

Procedures of conducting the study
The study lasted for eight weeks, and in the first week all subjects (students) took a pre − test related to morphology and English language word formation. After the pre test, a lesson of forty minutes was taught to all the subjects on morphemes, morphs and morphological processes in English language word formation for two weeks, twice per week in each zone. This was conducted in each school for four weeks in the zones. After the lessons the subjects were divided into two groups (control and experimental) each school chosen had the same number of males and females to give the total of 200 subjects from 20 schools chosen from the two educational zones. The groups were treated with ELAT and MIOBG respectively. A two-week break was observed in the third and fourth weeks. In the sixth week post test was conducted based on the instrument in each group. In the final week after post test the responses from the instruments were scored based on a five point Likert scale while nominal values 1,2,3,4,5 were assigned for SPSS coding.

DATA ANALYSIS

Mean, standard deviation and analysis of covarant were used to provide answers to research questions and test the significance of the difference that may exist.

RESULTS

Research question one: To what extent do the mean scores of students treated with MOBG technique inference English language vocabulary building vary from students treated with traditional method of learning morpheme? The first research question sought to investigate if there was: any difference between the performances of students treated with IOBG technique in morpheme compared with the students treated with traditional method of teaching morpheme. The results are shown below. Table 1 shows .8703 as mean gain of experimental group with standard deviation of .69059 and the control group had the mean gain of .7995 on performance. Meanwhile, control group had post test standard deviation score of .62618. The standard deviation scores difference in experimental and control group was .06441. These results showed that post test mean gain of experimental group was as a result of performance ability on card game of the learners who were exposed to the treatment.

Table 1

 Mean and standard deviation scores on performance ability on card game of treatment and control groups.

Group	Mean pre test	Mean post test	Mean gain	Std. Deviation
Experimental n = 100	1.4264	2.2967	0.8703	0.69059
Control n = 100	0.9438	1.7433	0.7995	0.62618
Mean differences	0.4826	0.5534	0.0708	

Table 2 Contains $F_{(1,199)} = 14.32$ while $p < 0.05$ this implies that the use of MOBG (game) in teaching and assessing learning outcomes on morphemes had significant effect on English language vocabulary building. That is morpheme game has impact on English language vocabulary building. Table 5 also corroborated that MOBG was at $F_{(1,193)} = 13.00$ @ $p < 0.05$, shows significant of the game (MOBG) against the conventional method.

Table 2: Summary of analysis of covariance posttest of morpheme game and conventional method of learning morphemes

Test	SUM OF SQUARE	DF	MEAN SQUARE	F	SIG
Regression	6175.68	1	6175.68	14.32	0.009*
Residual	23966.84	199	120.44		
Total	30142.52	200			

* Significant @ 0.05

Research Question Two
What is the effect of gender composition of students exposed (treated) with MOBG and those treated with traditional method of learning morphemes?
Table 3 shows that f (2,193) = .85, & .72@ p = .35 & .42 both not significant. This implies that sex (gender) has no significant influence on the performance of learners in either with the used of MOBG or ELAT as a tool of learning and facilitating morphemes.

Table 3:Analysis of Covariance (ANCOVA) of students' achievement scores

Source Of Variation	Sum Of Square	Decree Of Freedom (df)	Mean Square	F	Sig	Decision @ 0.05
Covariate (pre test)	3187.28	1	3187.28	14.22	.00	S
MOBG	2116.01	1	2116.01	13.09	.00	s
ELAT	1063.46	1	1063.46	8.81	.14	Ns
MOBG* GENDER	390.32	2	195.16	.85	.35	Ns
ELAT* GENDER	371.94	2	185.97	.72	.42	Ns
Explained	7129.01	7	1018.43			
Residual	5382.81	193	27.89			
TOTAL	**12511.82**	**200**	**62.56**			

s = Significant @ 0.05; Ns = Not significant @ 0.05

DISCUSSION

Evidence from the findings of this study reveals that morphemes game has significant effect on students performance in English language vocabulary building. Group A (experimental group) had higher mean scores than group B that were taught the same learning content with conventional method. These findings were in support of other researches which determined that, to learn basic rudimentary English language vocabulary building, students must, with quality instruction, master basic skills in word pattern and word formation (Hoon, chong & Binti Ngah, 2010). Research has also shown that gaming process may be an optimal teaching and learning approach to facilitate student learning of skills in English language vocabulary building (miller & Robertson, 2010). These findings were a bit different from the view of Onwioduokit and Akintobobola (2005) who assessed the efficacy of pictorial and written advance organizers to improve learners' performance. They found that pictorial organizer is more effective in enhancing students' performance than written organizer.

The results of this study also showed that gender (sex) had no significant impact on the performance between male and female students in the two groups (experimental and control groups). The findings of this study were in line with the findings of researchers who had also been interested in the differential effects of games between gender groups. While several studies have reported various gender differences in the preferences of OBG and computer game (Agosto, 2004;

Kinzie & Joseph, 2008), a few studies have indicated no significant differential impact of OBG between genders (Vogel et al., 2006). To date the studies examining OBG, computer game and gender interaction are far from conclusive.

It is therefore suggested that the use of objects based games should be encouraged in classroom activities so as to facilitate learning. Teachers may integrate the use of MOBG in teaching morphemes since using a single or traditional technique for morphemes, morphs and morphological processes in English language word formation results in little learning. MOBG, however facilitates self – access activity and learners' needs.

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