

# The Impact of Open-Book Testing Approach on the Achievement of EFL Sudanese Students at Tertiary Level

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مجلة  
كلية  
التربية  
جامعة الخرطوم  
العدد الثامن عشر  
السنة الثالثة عشرة  
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## Abstract

This study sought to investigate the impact of open-book assessment on third year students' English language achievement at University level. The importance of this study stems from the need for adopting many different methods of assessments which are valid and reliable to ensure that these programmers can achieve their objectives and educational aims. This study used the qualitative method for data collection. Two tools were used, an experiment and a questionnaire to collect data to answer the research questions addressing the problem. The sample of 40 students was selected and divided into two groups, an experimental group and a control group, 20 students in each group. Data was collected from the students through a questionnaire. The results of the study showed that the group who was subjected to open-book assessment outperformed their peers in the control group. In addition, analysis of variance tests showed that open-book assessment is more effective in enhancing higher-order skills. The result of Chi Square test reveals that implementing open-book assessment raises a number of challenges and obstacles on part of the students. It is recommended that the students

## مستخلص

سعت هذه الدراسة إلى التحقق من تأثير اختبارات الكتاب المفتوح على تحصيل طلاب السنة الثالثة في اللغة الإنجليزية على المستوى الجامعي. تنبع أهمية هذه الدراسة من الحاجة إلى اعتماد العديد من طرق التقويم المختلفة والتي تعتبر صحيحة وموثوقة لضمان أن تلك البرامج يمكن أن تحقق أهدافها التعليمية. استخدمت هذه الدراسة الطريقة النوعية لجمع البيانات. فقد تم استخدام أداتين، تجربة واستبانة لجمع البيانات للإجابة على أسئلة البحث التي تعالج المشكلة. تم اختيار العينة المكونة من 40 طالباً وقسمت إلى مجموعتين، مجموعة تجريبية ومجموعة ضابطة، 20 طالباً في كل مجموعة. وأيضاً تم جمع البيانات من الطلاب من خلال استبانة. أظهرت نتائج الدراسة أن المجموعة التي خضعت لتقويم الكتاب المفتوح قامت بأداء أفضل من أقرانها في المجموعة الضابطة. بالإضافة إلى ذلك أظهر تحليل اختبارات التباين أن تقويم الكتاب المفتوح أكثر فعالية في تعزيز المهارات العليا. وأن نتيجة اختبار مربع ك أظهر عدداً من التحديات والعقبات من جانب الطلاب. لذا أوصت الدراسة بأن يتعلم الطلاب كيفية الاستعداد لاختبار الكتاب المفتوح والذي لا يمكن استخدامه لوحده، ولكن يمكن استكماله باستخدام اختبار الكتاب المغلق.

الكلمات المفتاحية:

اختبار الكتاب المفتوح - المغلق - العصف الذهني- التحصيل الدراسي.

should learn how to prepare for open-book examination which need not be used solely, but may be supplemented by closed-book examination.

**Keywords:**

open- and closed- book assessment, critical thinking, achievement.

## Introduction

Examination is one of the very important tools to assess learning and give feedback for learners and teachers alike but recently many education experts have voiced their criticism of traditional examinations. Therefore, conventional or traditional examination is to test how much information the students have been able to retain. Thus students recall the information in class notes and textbooks then transfer it to answer sheet during the test. This kind of test based on the amount of information retrieved and then how to locate it properly in order to pass the final examination. Accordingly, students may display superficial learning and struggle in learning English language when they move to higher levels. So, there is necessity for students to adopt deep learning strategies to achieve the objectives of the educational process. One of the aims of this study is to change this traditional way of testing and proceed towards absorbing and learning at higher cognitive level skills. On other hand, the purpose is to use alternative assessment approaches to promote active learning and use knowledge in real world environment. Also, the study is an attempt to encourage testing beyond recalling and memorizing information. Mohanan (2021) defines an “open book examination is an assessment method designed in a way that allows students to refer to either class notes and summaries or a “memory aid”, textbooks, or other approved material while answering questions. An open book exam can also mean that students are provided with the exam questions prior to sitting the formal exam or are to complete as a ‘take-home’ exam”.

Meanwhile, the effectiveness of open-book examination or closed-book examination is to gauge a student performance and achievement is open for argument. In

general, open-book test reduces student anxiety due to Theophilides and Dionysiou (1996), it pushes the student to read more and concentrate on understanding concepts and principles. However, Francis (1982), Ioannido (1997); Theophilides and Dionysiou (1996) on the contrary, indicated that the marks obtained by students who did open-book examination were lower than those obtained by traditional manner possibly due to a higher level of difficulty and complexity of the questions thus required a higher order of critical thinking. As early as (1969), Kalish had already mentioned that the use of open-book examination encourages students to concentrate on ideas and concepts. Furthermore, open-book helps in developing the methods of teaching and learning, as well as, lessening the amount of knowledge which only to be needed to recall for an examination and which will probably not to be required after that (Bacon 1969). On the other hand, Mohanan (2004) indicated that the closed-book approach in education is to treat the information content of a subject matter as the most important. It facilitates the transfer of information from the textbook to your mind. What you are expected to do is to understand this information, retain it, and retrieve it during the final examination. The third year students at Sudanese University used to adopt a traditional method in learning English language and retrieving information instead of using critical and creative thinking to answer the questions of examinations. This study deals with the impact of open-book assessment on third year students' English language achievement as a quest to find the best methods for their teaching and learning.

## Review of the Literature

Izard (1992) pointed out the significance of assessment stems from that: Assessment has the function of providing valid evidence of learning achievement as well as to inform students, to facilitate the provision of further learning or to certify that a required level has been achieved. When making the assessment the findings of literature review in the domain of open-book examination, it is necessary to take the context, time and place into consideration. Therefore, this is an attempt to connect the previous studies with our study on the Impact of Open-Book Assessment on Third Year's English Language Achievement as possible as we could.

## Open-Book Examination and Critical Thinking

Open-book assessment (OBA) is not a new concept in the field of testing, but it rather dated back to 1935 by Stalnaker and Stalnaker (1935) described a three-hour of open-book comprehensive examination at the University of Chicago. According to Eilertsen & Valdermo (2000) mentioned that "In its most basic form, Open-Book Assessment (OBA) refers to students' use of textbooks, notes, journals, and reference materials while taking tests. "OBes have been proposed as an alternative and more effective method of assessment to the closed-book examination whereas Theophilides & Koutselini (2000) stated that "an established procedure in higher education in the sense that it is both widely and frequently applied ... it requires students to answer test questions based on their ability to use the knowledge they can recall". Ioannidou (1997) pointed out that the Student achievement is graded against "the ability to memorise facts and what others have thought and said ... Evangelia & Fotios (2013) "In contrast, OBes have been related to the evaluation of high-level cognitive skills such as conceptualizing, problem-solving and reasoning. Halpern (2014: p.8) defined critical thinking (CT) as "the use of cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and goal directed - the kind of thinking involved in solving problems, formulating inferences, calculating likelihood, and making decisions..." Theophilides & Koutselini p.382 stated that the primary goal of an open-book examination, therefore, is to promote higher order of critical thinking skills by having students draw upon information from various sources and synthesize their answer which in turn improves understanding. The open-book examination also, allows the lecturer to assess the student's skill concerning identifying and recalling adequate information, implementing these sources to the particular case or context and critically analyzing that information. In the same context Race, Brown and Smith (2005) pointed out that Open-Book Examinations (OBes) are similar to traditional exams, but with the major variation that students are allowed to take with them sources of references material into examination's room. Alternatively, candidates may be issued with a standard set of resource materials that they can consult during the exam, and are informed in advance about what will be available to them so that they can prepare themselves by practicing to apply the resource materials. Sometimes, in ad-

dition, the 'timed' element is relaxed or relinquished, allowing students to answer questions with the assistance of their selected materials due to their haste.

The term of critical thinking has a foundation in three domains: Education, Psychology, and Philosophy. The whole society (students, teachers, stakeholders, parents, policy makers and employers) wants critical thinking in the real world. Thus, developing critical thinking skills is not a new notion. Osborne (1932, p.402) stated that, "... it is assumed that development of thought power is one of the main goals of education". Therefore, critical thinking is badly needed in the field of education for both teachers and learners alike.

In fact, the twentieth-first century has brought more knowledge with it. It is not easy for students to encompass of this a tremendous knowledge. So the best way is to think critically to obtain reasonable knowledge in their field. Pascarella and Terenzini (1991) defined critical thinking like this "... critical thinking can be defined and scaled in some ways but typically includes the individual's skills to accomplish some or all as follows: first, know key issues and assumptions in the argument. Second, identify important relationships. Third, make correct inferences from data. Fourth, infer conclusions from information or data provided. Fifth, interpret whether conclusions are justified on the basis of data given. Sixth, evaluate evidence or authority." However, critical thinking is required in the learning process to test measurement tools, validity, and evaluation.

Thus, critical thinking is based on many different criteria such as reasoning, analyzing, inference, and solving problems. These factors are required in the open-book assessment and learning process to evaluate and make the right decision.

## Merits and Demerits of Open-Book Assessment

There are many types of researches have shown that the open-book examinations had many different crucial advantages Stalnaker & Stalnaker (1934) indicated that: to present a more natural situation, to confirm of comprehensive thought questions, to see relationships between facts, to use facts in solving problems, to evaluate realities, to deduce from one situation what will happen in the same case, and to regulate

facts from different sources. Tussing pointed out as early as (1951) that the open-book examination “removes much of the fear and emotional block encountered by students during examinations, while, at the same time, it emphasizes practical problems and reasoning rather than memorisation of facts.” Kalish (1958) mentioned that the open-book examination “makes students believe that they will be successful in the course” thus; they may not prepare well for the examination. John Francis (1982) reviewed the literature dealing with the advantages and disadvantages of open-book examinations involved the advantages such as: First, Students relied on rote learning. Open-book examinations deemphasize the importance of memorization. Second, their anxiety about an examination was reduced. Students could find references and textbooks that contributed to their trust. Third, learning occurred during the examination. With the assistance of resources, students were able to learn when they dealt with solving problems. Last, factual knowledge was still learned. Open-Book Examination enhances information retrieval skills. The main disadvantages were: the test takers lost time in the examination using the materials. Too much time may be spent on finding out which parts of the textbook or reference to use. Moreover, learning of the materials was reduced. Students may think that they do not need to study as much or they may not take into their consideration the time will take to transfer the information from textbooks into their answer sheet. In addition, students apply irrelevant answers to the questions of the examination. Students may place too many books, or references are not related to the examinations that lead to confusion among them as a result for this, they give the wrong answer to the questions. (Ionnidou, 1997; Eilertsen & Valdermo, 2000) Indicate that most students underestimate the need for preparation and selection of reference material to be used during the examination. This lack of preparation for test could affect the psychometric quality of the tests negatively. Rissanen (2016) pointed out that one of the most important objectives of open book examination is to figure out where students are in their learning process. The role of teacher is to prepare students for the best environment in which they are going to be tested. Green, Ferrante & Hepard (2016) show that to prepare our students for careers in the open-book field they will face after graduation, we think that open-book examination is effective in developing students learning and well-prepared them for real-life operational decision making.

## The Present Study

As a matter of fact, learning English as a second language is likely to represent a challenge for third year students at college because they used to apply bad habits in learning depended on memorizing and cramming in previous stages. So, a closed-book examination contributed in testing student's abilities not to think his\her knowledge but regurgitate the information. Studies have shown that the closed-book examination is inappropriate in certain courses when we use critical thinking. So, we need to use open-book testing approach to the educational goals.

This study seeks to investigate the role of open-book assessment on the third year students' English language achievement by teaching a course on American Literature and applying an open-book examination to achieve this purpose. The problem of this study stems from the need for adopting multiple methods of assessments which are valid and reliable to guarantee sufficient programmes that serve the objectives of the educational process. Thus, the open-book test is the type of testing that could be used in higher education that encourages students to develop their abilities especially in solving problems and using higher order thinking skills.

### *Methodology*

This study used the qualitative method for data collection. Two tools were used, an experiment and a questionnaire to collect data to answer three research questions addressing the problem. Also, the researcher used the statistical analysis SPSS to deal with data collected.

### *Sample*

In this study, the sample consisted of 46 students from the Department of English Language, Faculty of Education, at the University of Khartoum. Of 46 students 41 were females and 5 were males. 6 students of the 46 were discarded; a sample loss as a result of students' absences. The sample of the students was 40 which were divided into two groups, an experimental group and a control group, 20 students in each group. Data was collected from the students through a questionnaire which was distributed immediately to students after mid-term examination. The experimental method by selecting two groups, one group was taught by using conventional method, and the other was taught by using the new method. However, both groups



were tested by the open book examination in the posttest. One of the reasons that for choosing the third year students because they received 3 years of instruction in English Language at University level. This period equips them with the ability to acquire knowledge, build new knowledge, apply available knowledge to solve problems and make intelligent decisions.

## Procedure

The instrument used to collect data is a pretest and post-test in American Literature course achievement. The questionnaire was immediately conducted after the mid-semester test (2017). Meanwhile, the questionnaire was designed to collect information on the students' performance; their preference of examination formats; their perception of open-book examinations; their expectation grade of the exam.

The idea behind this questionnaire was to determine whether any of these variables impacted academic performance for open-book formats. Students responded to each statement using a 5-point Likert-scale.

### Test Validity

The researcher used SPSS Package(version ?) to measure test validity and reliability. Pearson correlation through Split-half method was used to find the correlation. Also, Cronbach's Alpha and Spear-Brown equations were used.

#### 1- Internal Consistency:

The following table below shows correlation coefficient between the questions that were asked for students in the posttest.

Table (1) Correlation Coefficient between sub-questions of the posttest

No of Questions	Correlation Coefficient	Probability Value	Result
Q1	88.0	0.01	Significant
Q2	85.0	0.01	Significant
Q3	84.0	0.01	Significant
Q4	71.0	0.01	Significant
Q5	86.0	0.01	Significant
Q6	78.0	0.01	Significant

As can be seen from the table (1) above that all correlations coefficient of the sub-questions are statistically significant, indicating that the scale has an internal coefficient consistency. However, all the questions of the test measured one variable that is students' understanding of American Literature.

## 2- Internal Correlation Coefficient:

The following table below shows internal correlation coefficient for sub-questions of the posttest.

Table (2) Correlation Coefficient:

Degree	Correlation Coefficient	Validity	Result
	836.0	91.0	Validity is very high

In the above table (2) shows that the correlation coefficient is significant at 836.0, and validity is 91.0. From above application it is clear that the test has a very high degree of validity.

## Test Reliability:

To be sure of reliability of the instrument, the internal consistency reliability was checked. This is because this type of reliability is more appropriate for the test.

The researcher designed the questions which were consistent with each other and elicit the information were needed.

Table (3) Alpha Cronbach and Spear-Brown Scale

Items No	Alpha Cronbach's value	Spear-Brown
Questions 6	89.0	87.0

In the table above (3) shows that the scale has high reliability; it has reached 89.0 according to the Alpha Cronbach's method. Also, Spear-Brown is 87. 0. So, the scale is highly reliable in measuring high-order skills in American Literature.

## Homogeneity:

Table (4) Independent Sample Test

Group	No	Mean	.Std	T	d.f	Sig	Result
Control	20	25,15	9.10	0.82	38	0.41	No differences
Experimental	20	27,45	8,54				

As can be seen from the table (4) above that the value of (t) for differences between the control group and the experimental group in the pretest at 82.0 is not statistically significant. It shows that there is homogeneity between two groups.

#### 4 Test Validity (Questionnaire for Students)

The questionnaire is compiled by following the various research studies (Loi & Teo, 1999; Theophilides and Dionysiou, 1996; Theophilides and Koutselini, 2000). The researcher made modifications for some items then exposed the questionnaire to the experts in the field. Questions were formulated to gather appropriate data to provide information regarding the research set.

##### 1-Internal Consistency:

The following table below shows the internal consistency for Pearson measurement based on students' responses.

Table (5) Pearson Correlation for Students' Questionnaire

No of Questions	Pearson Correlation	Sig. (2-tailed)	No of Group	Result
2	0.15	0.25	20	No Correlation
3	0.75	0.01	20	There Is Correlation
4	0.69	0.01	20	There Is Correlation
5	0.33	0.05	20	There Is Correlation
6	0.47	0.05	20	There Is Correlation
7	0.65	0.01	20	There Is Correlation
8	0.63	0.01	20	There Is Correlation
9	0.33	0.05	20	There Is Correlation
10	0.29	0.11	20	No Correlation

It can be seen from the above table (5) that there is a correlation between the total degree and the items of the questionnaire except questions 2 and 10. So, all the items of the questionnaire connected with students' viewpoints about the open-book examination. These items confirm that the questionnaire has high consistency according to the students' responses in Pearson scale.

### **Test Reliability:**

To be sure of reliability of the instrument, the internal consistency reliability is checked. This is, because this type of reliability is more appropriate for the test.

The researcher designed the questions which are consistent with each other and elicit the information needed.

### **Coefficient of Reliability:**

The following table below shows Alpha-Cronbach and Spear-Brown measurement for students' questionnaire.

**Table (6) Alpha-Cronbach and Spear-Brown measurement**

No	No of Cases	No. of Items	A alpha Cronbach	Spear-man-Brown
Reliability Coefficients	20	9	0.61	0.71

It can be seen from the above table (6) that Alpha-Cronbach is 0.61 and Spear-Brown is 0.71, so the questionnaire has a good reliability.

### **Results**

#### **Question one**

How do Sudanese students' English language at University level achieve in open-book assessment?

There is a positive achievement of open-book assessment on Sudanese students' English language at University level.

To test this hypothesis, the researcher used t-test for showing the difference between the means of two independent samples at the level 0.05 of significance and to compare between the control group and the experimental group and the results were shown in the following table.

**Table No (7) T-test results of the experimental group and the control group**

N	Group	Mean	Std.	t-value	d.f	Sig	Result
20	Experimental	28.90	12.39	1.96	38	0.05	There is a difference
20	Control	22.25	08.71				Between 2 groups

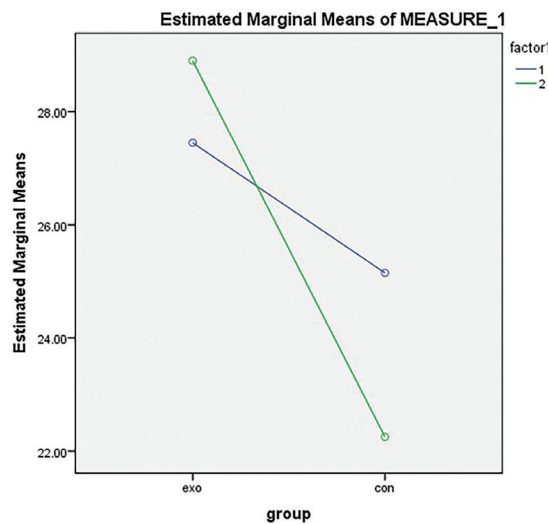
It can be seen from the above table (7) that the value of (t) the difference between the mean degrees of the experimental group is 28.90 and control group is 22.25, with degree of freedom 38. So, the value of (t) is 1.96 statistically significant at the level of 0.05 for the experimental group. It shows that the experimental group has a higher level of achievement. Therefore, the first hypothesis was positively verified. In addition, the mean of the experimental group is 28.90 whereas it is 22.25 in the control group. It is obvious that the mean value of the experimental group is higher than the control group that means the students in the experimental group have achieved better than the control group.

Table No (8) ANOVA pretest and posttest for control group and experimental group

Source	Factor 1	Type3 sum of square	d.f	Mean Squares	F	Sig
Factor 1	linear	10.513	1	10.513	0.465	0.50
Factor group	linear	94.613	1	94.613	4.184	0.05
Error f1	linear	859.375	38	22.615		

It can be seen from the above table (8) that the value of (f) between the pre-test and post-test for the control group and experimental group (correlation) at 4.18 is statistically significant at the level 0.05. To show the form of correlation, the researcher used Test of Within-Subjects Contrast diagram. The following diagram can show this correlation:

Figure No (1) Estimated Marginal of Measure



It can be seen from the above figure (1) that the difference between the pre-test and post-test in the two groups. In the experimental group the pre-test was 27.45 increased to 28.90 in the post- test, whereas in control group the pre-test was 25.15 decreased to 22.25. It indicates that there is an increase in the experimental group and deterioration in the control group.

### Question two

To what extent does open-book assessment impact significantly on Sudanese students' English language at University level?

There is a significant influence of open-book assessment on Sudanese students' English language performance at University level.

To test this hypothesis, the researcher used t-test for two independent samples and the results indicated as follows in the table below.

Table No (9) T-value between the experimental group and control group

Q	Group	N	Mean	Std.	T	d.f	Sig. (2-tailed)	Results
q1	Exp.	20	6.95	2.438	1.92	38	0.06	No differences
	Con.	20	5.50	2.328				
q2	Exp.	20	5.00	2.902	1.53	38	0.13	No differences
	Con.	20	3.85	1.694				
q3	Exp.	20	4.40	2.458	1.29	38	0.20	No differences
	Con.	20	3.60	1.273				
q4	Exp.	20	3.45	3.300	1.19	38	0.24	No differences
	Con.	20	2.35	2.519				
q5	Exp.	20	4.80	2.016	2.03	38	0.05	Differences to Exp.
	Con.	20	3.50	2.039				
q6	Exp.	20	4.25	2.074	1.69	38	0.10	No differences
	Con.	20	3.30	1.418				
Total	Exp.	20	28.85	12.377	1.96	38	0.05	Differences
	Con.	20	22.25	8.711				

It can be seen from the above table (9) that the t-value for the difference between the experimental group and control group in the total degree of sub-questions extends from 1.92 to 2.03 which is statistically significant and question 5 is for experimental group, whereas the rest of questions are not significant in t-value. Furthermore, the achievement of the experimental group is more than that of the control group so it can be said that open-book assessment is more effective in enhancing higher-order skills.

In question 1, the students were asked to compare and contrast, there was no significant difference between experimental group and control group. The mean value of the total score for the experimental group was 6.95, whereas for control group this was 5.50, a difference which was not statistically significant.

In question 2, the students were asked to apply their abilities to solve the problems, there was no significant difference between experimental group and control group. The mean value of the total score for the open-book examination was 5.00 whereas for control group this was 3.85, a difference which was not statistically significant.

In question 3, the students were asked to analyze the problem, there was no significant difference between experimental group and control group. The mean value of the total scores for the experimental group 4.40 whereas for control group this was 3.60, a difference which was not statistically significant.

In question 4 of the test which evaluated the ability of argumentation, there was no significant difference between the experimental group and the control group. The mean value of the total scores for the experimental group 3.45 whereas for the control group this was 2.35, a difference which was not statistically significant.

In question 5 of the test which compared, there was significant difference between experimental group and control group. The mean value of the total scores for the experimental group was 4.80 whereas for control group this was 3.50, a difference which was statistically significant (in favor of) for experimental group.

In question 6, the students were asked to defend their answers, there was no significant difference between experimental group and control group. The mean value

of the total scores for the experimental group 4.25 whereas for control group this was 3.30, a difference which was not statistically significant.

**Table No (10) Mann-Whitney U the differences between males and females**

Q	Gender	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Sig. (2-tailed)	Result
q1	Males	4	12.25	49.00	25.000	0.50	No differences
	Females	16	10.06	161.00			
	Total	20					
q2	Males	4	16.88	67.50	6.500	0.01	Differences for males
	Females	16	8.91	142.50			
	Total	20					
q3	Males	4	16.50	66.00	8.000	0.02	Differences for males
	Females	16	9.00	144.00			
	Total	20					
q4	Males	4	9.13	36.50	26.500	0.59	No differences
	Females	16	10.84	173.50			
	Total	20					
q5	Males	4	16.88	67.50	6.500	0.02	Differences for males
	Females	16	8.91	142.50			
	Total	20					
q6	Males	4	15.38	61.50	12.500	0.06	No difference
	Females	16	9.28	148.50			
	Total	20					
Total	Males	4	14.50	58.00	16.000	0.13	No Differences
	Females	16	9.50	152.00			
	Total	20					

It can be seen from the above table (10) that (U) value according to Mann-Whitney for male students and female students extend from 6.50 to 16.50 is not significant in the total degree, whereas there are differences in questions 2,3,5 in favor of male students. Of twenty only four were male students, which reflected the gender ratio of students in the department.



### Question three

How might students face challenges and obstacles when using open-book assessment at University level?

Some challenges and obstacles might face students for using open-book assessment at University level.

Table No (11) Chi-Square Test

N	Item	1	2	3	4	5	Chi	d.F	Sig	Results
2	If the students have taken any open-book examination before	0	1	1	2	16	45.5	4	0.01	Difference
3	The degree of easiness and difficulty of the examination level	1	3	5	8	3	7	4	0.14	No difference
4	The expectation of their grades	4	2	11	3	0	17.5	4	0.01	Difference
5	The number of the reference books they brought with them for the examination	2	8	8	2	0	14	4	0.01	Difference
6	The usefulness of the reference books	2	8	2	4	4	6	4	0.20	No
7	The preference of choosing the examination	11	9	-	-	-	0.20	1	0.65	No
8	The difficulty of preparing notes for open-book examination	3	5	5	6	1	4	4	0.41	No
9	The Lessing of the stress of the examination	1	7	4	1	7	9	4	0.06	No
10	The impact of open-book examination on critical thinking	0	5	7	7	1	11	4	0.03	Difference

It can be seen from the above table (11) that the students' responses for questions were asked in the questionnaire. If the students have taken any open-book examination before, Q2, was rated with 1 denoting very frequently, 2 frequently, 3 occasionally, 4 rarely and 5 never. Chi-Square value was 45.5 and significance was 0.01, so there was significance different between the students. The degree of easiness and difficulty of the exam level, Q3, was rated with 1 denoting very easy, 2 easy, 3 just right, 4 difficult and 5 very difficult. Chi-Square Test was 7 and significance was 0.14, so there was no significance difference between the students. The expectation of their grades, Q4, was rated with 1 denoting excellent, 2 very good, 3 good, 4 fair and 5 poor. Chi-Square Test value was 17.5 and significance was 0.01, so there was significance different. The number of the reference books they brought with them for the examination, Q5, was rated with 1 denoting none, 2 one, 3 two, 4 three and 5 more than three. Chi-Square was 14 and significance was 0.01, so there was significance different. The usefulness of the reference books, Q6, was rated with 1 denoting very helpful, 2 helpful, 3 neutral, 4 not helpful and 5 not helpful at all. Chi-Square value was 6 and significance was 0.20, so no significance different. The preference of choosing the examination, Q7, was rated with 1 denoting open-book examination, 2 closed-book examination. Chi-Square Test value was 0.20 and significance is 0.65, so no significance different. The difficulty of preparing notes for open-book examination, Q8, was rated with 1 denoting very easy, 2 easy, 3 just right, 4 difficult and 5 very difficult. Chi-Square value is 4 and significance was 0.41, so no significance different. The lessening of the stress of the examination, Q9, was rated with 1 denoting strongly agree, 2 agree, 3 don't know, 4 disagree and 5 strongly disagree. Chi-Square Test value is 9 and significance was 0.60, so no significance different. The impact of open-book examination on critical thinking, Q10, was rated with 1 denoting strongly disagree, 2 disagree, 3 neutral, 4 agree and 5 strongly agree. Chi-Square Test value was 11 and significance was 0.03, so there is significance different.

The analysis depended on the response of students for the second question, indicated that most students had never sat to the open-book examination before. Meanwhile, this was the first time and new experiment for them.

The analysis indicated that the mid-term examination was difficult, in particular

most students used to take closed-book examination. In spite of difficulty of open-book examination, most students expected to obtain good marks.

The analysis also showed that there were not significant differences in questions 6, 7, 8 and 9 as result to: the students who preferred open-book examination. Most students used between one or two reference books during the examination and found difficulty in preparing notes for open-book examination. Also, it might be seen that there was slightly different among students who found reference books helpful for them during the examination.

This was the first time for students to use the open-book examination at the university level it might be a new experience to most of them. The students faced difficulty and did not agree that open-book examination reduced their stress.

The analysis indicated that the open-book examination left room for logical or critical thinking especially for students who preferred for open-book examination.

This study similarly found that open-book exam resulted in enhancing critical thinking and developing students' abilities especially in solving problems that supported the second hypothesis. Also, the findings of this study supported the third hypothesis that the students found the open-book assessments were difficult and source for challenging.

## Discussion

*H1*- The study proved the impact of open-book assessment on third year students' English language achievement at University level.

The statistical analysis showed that there was a significant statistical difference between the averages of the experimental group was 28.90 whereas the control group was 22.25 with degree of freedom at 38. The T-value was 1.96 statistically significant at the level 0.05. Furthermore, the F-value between the pre-test and the post-test for the experimental group and the control group at 4.18 was statistically significant at the level 0.05.

These results can be interpreted in the light of the previous studies like this:

Some studies showed that using books or notes at exam improve performance;

Lachman (1963) pointed out there was some evidence to indicate that the variance of score increased under the open-book condition. Lachman (1963) suggested that perhaps more competent students receive help from using an open-book, while the less competent students use the book inefficiently and consequently have lower scores than would be obtained under the closed-book condition. Marco (1966) found out that achievement scores were consistently better on open-book examinations, although the differences were small and no practical importance. Shirleyanne (1972) proved that the achievement scores were significantly higher on open-book examinations for knowledge items, comprehension item, and total test item scores. Accordingly, the present study was in agreement with above studies that the score increased under the open-book assessment. So, open-book assessment had a big impact on third year students' English language achievement. These findings support that assumption underlying this study according to achievement scores was higher on open book examination for the experimental group in total test item.

Meanwhile, this study was in disagreement with Lachman (1963) and Marco (1966) studies that the two writers used multiple choice formats to measure knowledge and application whereas this study chose short answer questions and essay questions in testing students in mid-term examination, generally of the problem solving type, have been used.

A negative correlation between marks obtained and many texts consulted during the exams. The scores were higher in the closed-book test. (Kalish, 1958; Francis, 1982; Boniface, 1985; Ioannidou, 1997; Moore & Jensen 2007; Agarwal et al. 2008; Karagiannopoulou & Milienos, 2013; Amanda, 2015).

In this present study, the situation was different according to this: teaching, mid-term open-book exam was done as open-book examination for two groups. This means that students in the experimental group had received the suitable cognitive and metacognitive skills and strategies to deal with testing items requiring conceptualizing, analyzing, argument, reasoning and problem solving whereas, the control group was taught by conventional method for comparison between two groups.

**H2-** There was a significant statistical difference in T-value between the experimental group and the control group in the averages of sub-questions of the test ex-

tend from 1.92 to 2.03 was statistically significant and question 5 was for experimental group whereas the rest of questions were not significant in T-value. It can be said that the open-book assessment is more effective in enhancing higher-order skills.

The analysis based on the response of students for the first question of the post-test which was related to compare and contrast at the level of evaluating, shows that achievement item for the experimental group is not higher than control group under the open-book testing condition. That attributes some students might be confused to understand the question thoroughly. If you were asked to compare and contrast all Buck's master then, it is necessarily to compare it with something else (often, that other thing would be specified in the question). Compare and contrast substantially includes looking at something that is related to some other thing. I have to look at more than one thing. So, compare and contrast involve at least two different things.

In question 5 which was related to comparison only, there was significant difference in score between the experimental group and control group for the experimental group. That means the students in the experimental group were able to understand the question well so they achieved better than the control group.

One limitation of the item format might be shown at this point. Meanwhile, the means were not very different for using essay writing format in testing students. The essay writing format was chosen for the achievement test because the essay writing: a) gives the examiner an opportunity to give more justifications for his answer. b) The students try out ideas and arguments supported by evidence. c) Aims at measuring students' understanding for the syllabus and enables students searching for information and finds it under the pressure of the test. d) A short-answer or easy type of examination would generally allow the examinee more flexibility in choice of material to look up in the textbook and greater opportunity to look up information. e) Higher-order skills and critical thinking connected with evaluating and proving, the student needs space to show his\ her point of view clearly by giving evidences and reasons that support it. One drawback to use of essay writing is that generally it is that scored subjectivity of the examiner when he corrects the test.

Feller (1994); Theophilides & Koutselini (2000) indicated that the open-book examinations encourage students to use higher-level thinking skills such as concep-

tualizing, problem-solving and reasoning. These skills are required in the real-life situation.

In fact, English language learners who have developed critical thinking abilities are able of doing activities and tasks which other students might not be able to do it. In other words, the students to be professional in a language they need to be capable to think critically when using the target language.

**H3-** There was a significant statistical difference in Chi-square test value (questionnaire for students) in questions 2, 4, 5 and 10 whereas there were not a statistically significant in questions 3, 6, 7, 8 and 9. It can be said that there were some obstacles and challenges might face the students for using open-book assessment.

The analysis indicated that the mid-term examination was difficult, in particular most students used to take closed-book examination. In spite of difficulty of open-book examination, most students expected to obtain good marks.

The analysis also showed that there was slightly different for students who preferred open-book examination. However, most students used between one or two reference books during the examination and found difficulty in preparing notes for open-book examination. Also, it might be seen that there was slightly different among students who found reference books helpful for them during the examination.

This was the first time for students to use the open-book examination at the university level it might be a new experience to most of them. The students faced difficulty and did not agree that open-book examination reduced their stress.

The analysis indicated that the open-book examination left room for logical or critical thinking especially for students who preferred for open-book examination.

This study similarly found that open-book exam resulted in enhancing critical thinking and developing students' abilities especially in solving problems that supported the second hypothesis. Also, the findings of this study supported the third hypothesis that the students found the open-book assessments were difficult and source for challenging.

## Conclusion

It is obvious that assessment of students learning is a core issue for learners, teachers and those who are committed to the design of curricula, accreditation, quality assurance and review of courses. However, assessment must be used constructively to measure learning outcomes and then raise standards of learners.

Open-book assessment has emerged as an effective and innovative option related to testing higher order skills such as critical thinking, reasoning and solving problems. Open-book enhances the critical thinking, synthesizing and analyzing skills in students. Furthermore, it empowers students to implement knowledge that transferred from textbooks rather than simply memorizes in an applicable situation. The open-book test can be constructed and used in all various forms that the traditional test can be used. This type of examination is more applicable to evaluating student attitudes and presenting the question of what action should be taken in the real situation. Thus, the open-book test is the type of testing should be used in higher education that encourages students to develop their abilities especially in solving problems and using higher order thinking skills which are needed in real life.

## Suggestions for Future Research

The findings of this study showed that the use of open-book assessment might be a considerable alternative to conventional assessment and evaluation methods, particularly when students perceive requirements for test preparation in open-book examination.

1. Due to the limited sampling used in this study; generalizability of the results should be subjected to this limitation in its Sudanese context. More study is needed to assess the students in open-book assessment especially in higher-order thinking skills using a larger sample. The concept of open-book assessment is not new, but it is not commonly used in Sudan. So, there are not available studies regarding open-book examinations have been conducted. However, further research should be conducted for enhancing and raising awareness of using open-book examination.

2. Research is needed on many different trends of open-book assessment that were not examined in this study. First, this study conducted on students so it is important to conduct further research on a big number of University staff members and Secondary School Teachers for the share of exploring their views point and tendencies towards the effectiveness of the open-book assessment. Second, further research should be conducted to train and prepare teachers for constructing tests on open-book examinations. Third, research is needed in equipping teachers with new instructional techniques that are related to cognitive and metacognitive processes to face the needs of their students.
3. Research is needed for further experimental studies on whether the learners are able to construct new ideas while discussing a problem, on the part of misunderstanding expressed in the group discussion. However, discussion can enrich and enhance the students' abilities to create new ideas in learning attitude.



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