

# Impact of Open Files vs. Closed Files Testing: An Experiment with Mid-Eastern IT Students

*D. Neil Westley*

*Petroleum Institute, Abu Dhabi, UAE*

[nwestley@pi.ac.ae](mailto:nwestley@pi.ac.ae)

## Abstract

The question to be examined in the intended research is whether and to what degree access to previous files gives students an advantage during a practical IT test, i.e. does it produce higher results on tests and if so how much? The hypothesis is that viewing previous files will make little or no difference to student performance. This was validated by the results.

**Keywords.** access to files, open book, mid-eastern, IT, foreign language instruction

## Introduction

Students in advanced class in IT studying MS Excel functions at the Petroleum Institute in Abu Dhabi are presented with test problems requiring them to create files. In the folder where they create their files all previous files prepared during their studies are stored. Normally the students are not permitted to view these files during tests though exceptions have been made. Their previous files might provide valuable information and allowing them to view their files is very much like giving them an open book test.

Most of the students are young Arab men aged 19-21. They come from public high schools in the UAE where they have received instruction in Arabic, but have also studied English for several years, although a few are from other countries in the Middle East. Our course is taught in English; therefore they are second language or foreign language learners in the context of this research.

Students completing practical exams in IT can often access their previous work without being detected. As such access is normally forbidden it is a major concern for proctors to watch out for such activities. Therefore, it is of some practical importance to establish if having access to their files makes a difference or not to the student grades.

## Review of the Literature

A review of the literature has failed to find any studies on the effect of giving IT students access

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to their files during tests. However there have been some studies on the results of open vs. closed book tests among students in other disciplines in North America. While there are too many differences between this research and the proposed experiment to build directly on their findings, they still may hold some interesting implications for our work.

Several studies and experiments compare results of students' performance in open book vs. closed book testing situations. Most found no significant difference between performance under open and closed book tests (Jehu, Picton, & Fatcher, 1970; Kalish, 1958; Phiri, 1993), though in some cases small yet significant differences were found (Krarup, Naeraa, & Olsen, 1993; Schumaker, Butzin, Finberg, & Burg, 1977). However in most cases the open book tests were different from the closed book tests in their nature and objectives, so they failed to isolate the treatment variable and were substantially different from this research design. Some findings indicated that the different populations responded differently to the open book option (Schumaker et al, 1977). As none of these tests referred to the population (young men in the middle east), it further indicates that there are not any direct implications for this study other than to further underline the need for study of foreign language middle eastern students.

## The Comparative Experiment

### Objectives

1. Determine if viewing files (open files) improves test scores for IT university students in the Middle East.
2. Contribute to the field of research of learning in IT education.

### Hypothesis

Hypothesis: *Students completing a practical test on elementary Excel who can view their previous files (open files) will not perform significantly better than the same students when they complete another version of the test without being allowed to view their files (closed files).*

Note that we are not claiming that there is no difference in the groups. That is, there is no attempt to prove the null hypothesis which cannot be proven (Blackwelder, 1982). Our contention was that any difference would be small and unimportant. It is therefore deemed adequate for the purpose of this experiment to show that any enhancement of performance in the open files situation is not significant, that is the results do not show sufficient difference to reject the null hypothesis.

### Test Conditions

The tests were conducted in a computer lab. Students in all tests were presented with a startup file and a test document which specified results they were to obtain. This required them to make changes, use functions and formulas, and find answers in MS Excel. A sample of such a test is found in the Appendix at the end of this paper. The students had 30minutes to complete the tests. They were given one test right after the other, so they would complete two tests in one hour.

### Research Design

Pairs of classes with the same instructor received two tests, one immediately after the other. In one they are permitted and encouraged to examine and even copy from files prepared doing assignments on the material in the test. On the other test they were forbidden to look at their files and told that if they do so, it would be cheating and could lead to further sanctions.

The first class, which we will refer to as A were given an 'open files' test immediately before a 'closed files' test in the same class. The second class B were given the 'closed file' test first and the 'open file' test afterwards. The tests were similar in nature, and number of questions. There were two equivalent versions in each test, therefore four versions of the test in all.

In the class following the test, before the students received their results they completed a questionnaire concerning their expectations regarding their scores and their attitude toward and feelings about the tests.

Later in the course the testing procedure was reversed with class A doing a closed files test before an open files test and class B doing a closed file test before an open files test. Thus every student completed a closed book test before an open file test on one occasion and the reverse on a different occasion with a test on different material. These relationships are illustrated here (see Table 1).

**TABLE 1: Research design**

<b>Group A (8203)</b>	<b>Group B (8201)</b>
TEST 1 Session 1 15 students OPEN FILES test versions 1 & 2	TEST 1 Session 1 16 students CLOSED FILES test versions 1 & 2
TEST 1 Session 2 15 students CLOSED FILES test versions 3 & 4	TEST 1 Session 2 16 students OPEN FILES test versions 3 & 4
TEST 2 Session 1 15 students CLOSED FILES test versions 1 & 2	TEST 2 Session 1 16 students OPEN FILES test versions 1 & 2
TEST 2 Session 2 15 students OPEN FILES test versions 3 & 4	TEST 2 Session 2 16 students CLOSED FILES test versions 3 & 4

### **The influential factors**

- a. **The treatment:** Open files or closed files in testing situation
- b. **Other variables of possible consequence:**
  - i. Student ability
  - ii. Test session 1 or 2
  - iii. Version of test

### **Bias controlled by:**

- a- *Student Ability:* Same student writes one version of each test with open files and another version of the same test with closed files.
- b- *Test session 1 or 2:* By using student average scores for 2 tests, one in first session and one in second session, the effect of order is neutralized.
- c- *Version of test:* Each version of the test is used by one class of students in the open file condition and by the other class in the closed file condition thus neutralizing the difficulty of the tests relative to the treatment condition over the student sample.

### **Analysis of Results: Methods**

The effect of test order has been neutralized by using students' average performance on two tests with open files: one in first session and one in second session. This is then compared to the same student's average performance on two tests with closed files: one in the first session and one in the second session. This relationship can be shown for students in group A the 08203 class:

Performance with open files:

$(\text{test1 sess1 open files vs1\&2} + \text{test2 sess2 open files vs3\&4})/2$

This average is compared with the performance with closed files:

$(\text{test1 sess2 closed files vs3\&4} + \text{test2 sess1 closed files vs1\&2})/2$

A similar relationship exists for the 08201.

On a larger level the design controls for the influence of the version of the tests which the students write. One class writes each test bank i.e. versions 1&2 or versions 3&4 in the open file condition while the other group writes the same versions in the closed file condition. Thus the relative difficulty of the test banks should not affect the comparison between the treatment conditions. A slight bias may be introduced here as the two groups are of different sizes Group A 08203 comprises 15 students vs. Group B 08201 with 16. However it is not judged sufficient to significantly alter the findings.

### **Results of the Experiment**

The results of the experiment can be summarized as follows (see Table 2):

**TABLE 2: Results.**

<b>Class</b>	<b>Open files average %</b>	<b>Closed files average %</b>
Group A 8203	<b>70</b>	<b>68</b>
Group B 8201	<b>74</b>	<b>81</b>
Combined	<b>71</b>	<b>75</b>

The students performed slightly better in the closed file situation. There is no statistical analysis required to prove that superior performance in an open file situation is not significant, since students actually performed worse in the open file condition.

### **Weaknesses**

The sample size is small, only 31 subjects which nevertheless achieves the minimally acceptable standard for a significant sample size. Due to the unambiguous nature of the results it is felt that the conclusions are valid.

## **Conclusions from the Experiment**

Viewing previous files offers no significant advantage for foreign language Middle East students when writing IT tests.

While this conclusion can only be vaguely related to open book research in other disciplines it would seem to correspond to findings that indicate little or no advantage to open book conditions in most such research.

### **Implications for Further Research**

Similar research needs to be conducted with larger sample sizes to produce firm conclusions in this regard.

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## Appendix

### Version 2 of Quiz 1 Advanced Excel

# **YOU MAY LOOK AT YOUR FILES IN YOUR HOME FOLDER**

**Comp08203 Quiz1 (40 minutes)**

**Fall 2007**

**Foundation 3**

**Version 2 Session 1(WHITE)**



Name: \_\_\_\_\_

ID: \_\_\_\_\_

### Honor Pledge

"I pledge that this is my work and I am happy to have the results used in Mr. Westley's research to improve teaching.

Signature: \_\_\_\_\_

*For Instructor Use Only*

<b>Overall</b>
<b>/50</b>

## Advanced Excel Quiz 1 vs2 Fall 2007

1. Open the **AXLq1vs2 club** file from L: drive **AXL quiz** folder and save it to your home folder as *id name Q1vs2 club*.
2. Open the **Club** sheet.
3. Use this information to create lookup table in your spreadsheet below the data. (hint: you will have to make some changes)

<b>Body Weight in kilos</b>	<b>Energy Pills</b>
<b>Less than 60</b>	<b>2</b>
<b>60-79</b>	<b>4</b>
<b>100-119</b>	<b>6</b>
<b>80-99</b>	<b>5</b>
<b>120 and more</b>	<b>8</b>

4. Sort the table values in ascending order.
5. Use a vlookup in column C to find the right number of energy pills for the Weight lifters.
6. Convert the **Body Weight** values to Hexadecimal in column D to 3 digits
7. Convert **Daily Energy Pills** to Binary in column E to 5 digits..
8. In column G use the MOD function to show to see the remainder of the **Maximum Weight of Lift** divided by the **Body Weight in kilos**.
9. Using the **Angle of Curl Exercise in Degrees** column values to calculate the **Radians**.
10. Calculate the **SIN** and **TAN** in the columns shown.
11. In column L Calculate the ArcSIN values of the SINS.
12. Delete undefined values.
13. Open the Sales worksheet.
14. Name the range F7:F11 **Alltots**.
15. In row 6 using the correct functions calculate the standard deviation and variance of **Alltots**.
16. In I6 calculate the square root of the variance of **Totals**.
17. In J6 calculate the correlation between the **Activities Fees** and the **Sports Shop Sales**.
18. Prepare an XY Scatter plot graph with **Activities Fees** on the Y axis and **Sport Shops Sales** on the X axis.
19. Give the chart a good title and name the axis with titles that show what is shown on each axis.
20. Add text boxes with the cities beside the points that refer to them.

21. Add a trendline to the chart.
22. Save the workbook again to your home folder.
23. Copy and paste it to your classes work-finished folder.

## Biography



**D. Neil Westley** has been teaching programming and IT for over 25 years at college and university level and has authored a recent text book on MS Excel: *Intermediate Excel for Foreign Language Students*.

His research initiatives in teaching methodologies for IT and computing reflect his keen interest in learning processes as applied to these disciplines. He is currently a resident of the United Arab Emirates on faculty at the Petroleum Institute.