

# A NEW TOOL FOR CREATING MULTIPLE CHOICE TESTS AND REVIEWS IN MICROSOFT® POWERPOINT

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## ABSTRACT

It is widely accepted, that PowerPoint is the most commonly used presentation software in the World and many educators are using PowerPoint in their classrooms as a teaching tool. In this paper we present our new tool, called *PowerPointTest*, which is a powerful yet very intuitive and user-friendly instrument for creating and administering multiple choice tests and reviews as PowerPoint presentations. The tool consists of two template files only: an intuitive Excel template for entering questions and choices, and a PowerPoint template which actually creates a test or review with just few clicks!

## INTRODUCTION

Multiple choice quizzes and tests have been used for centuries and they are still very valid and commonly used assessment instruments among educators and assessment specialists. Almost all publishing companies provide multiple choice test banks for their textbooks. There are several commercially available software packages developed for creation and administration of multiple choice tests and quizzes. They include Test Builder - an online testing software designed in ASP to administer tests on your web sites (<http://richardhealey.com>); SCORM Test Builder by Rustici, which allows to build tests and quizzes and deliver tests with a SCORM-based LMS (<http://www.scorm.com>); ExamBuilder - a Web-based application that lets users create and administer exams over the Internet (<http://www.exambuilder.com>); TG2 r2.4.10 (<http://www.testshop.com>) and Test Pro Developer 8 Academic Edition by Atrixware (<http://www.atrrixware.com>) - a Microsoft® Windows Desktop Application which enables creation of eLearning content such as tests and surveys. All these and many other similar tools require software installations and generally have steep learning curves. After exploring many of these tools, we decided to create a new tool called *PowerPointTest*, which would require no installation, would have a very small size and would be extremely intuitive. We decided to use Microsoft® Office as a platform for our tool. In this first version of *PowerPointTest* we use Excel and PowerPoint. The rationale is very straightforward – almost all educators use PowerPoint and Excel on daily bases. Excel is used to create an intuitive Excel file containing multiple choice test questions and possible answers for each question including the specified correct answer(s). PowerPoint is used to create a PowerPoint test (or review) file based on questions from an Excel

file. The programming part, which is hidden from the user, is done in VBA for PowerPoint (Marcovitz, 2004) and VBA for Excel (Albright, 2001; Jacobson, 2002).

## **BASIC CHARACTERISTICS OF THE TOOL**

*PowerPointTest* allows the creation of two types of final products - multiple choice tests and reviews. Each test or review is a PowerPoint file which uses “one question-one slide” presentational approach. Below is the description of basic characteristics of the tool.

### **Automatic grade report.**

Students’ grades are electronically sent to the instructor. No more scantrons! As soon as a student completes the test, it will be automatically graded and the summary file will be generated. The summary file, among other things, contains student’s answers to all questions and his or her test grade. The file is automatically sent to the instructor as an e-mail attachment, while the subject of the e-mail contains student’s name and test grade – for quick information.

### **100% Paper-free.**

There is no need for making hard copies of the test for each student – all of them will get the same PowerPoint test file electronically. There are several ways of doing this – posting the file on the network drive, e-mailing it to students, etc.

### **Numerous variations of a single test.**

As it has been noted earlier, all students taking the test will get the same PowerPoint test file. However, each time when the test file is opened, a new version of the test will be generated **by shuffling all test questions within the test, and by shuffling all answer choices within each question**. This allows us to address two very important problems related to the creation and administration of multiple choice tests:

a) *Cheating*. In traditional case, when students are taking paper-based multiple choice tests and marking their scantron forms with selected choices, it is relatively easy for a dishonest student to look at his or her classmates’ solutions and copy them. Shuffling the order of questions and the order of answers within each question makes copying classmates’ solution almost impossible.

b) *Balanced key*. As we all are well aware, balancing the key for multiple choice tests is a very important part of test creation procedure [4, 5, 6]. It means that each option should be correct an approximately equal number of times. Not only scientific, but also conventional wisdom suggests that a balanced key is desirable in that it minimizes the effects of guessing. For example, Haladyna (1994) suggested that any serious departure from this formula would lead to higher-performing students deducing the pattern of correct answers and selecting guesses accordingly. Lower-performing students would be more disadvantaged, consistently selecting a single option for guesses, regardless of pattern. Ellsworth, Dunnell, and Duell (1990) found that most test banks that accompany textbooks do not provide a balanced key. Option “c” is used most often and option “a” is used least often. ***By shuffling options within each question, our tool automatically creates a balanced key test.***

### **Cheating challenge.**

As it was mentioned above, shuffling questions and answers within each question makes cheating more challenging task for dishonest students. In addition, more extra features are

implemented to secure test integrity.

a) The original test file will be deleted from the computer as soon as student starts taking the test.

b) Created summary file, which is named as *StudentName.ppt*, is password protected. When a student completes the test, this file is saved in the currently active folder and the student is advised to keep the file for his or her records. Thus, the student has the file, but is unable to open it – only the instructor can do so.

c) Every slide in the summary file contains test taker's name and the test completion time as footer.

d) Whichever computer was used to take the test, its (computer's) name will be saved in the summary file.

### **Test duration.**

If during the test creation process instructor specifies test duration (which is optional) then the remaining time for completing the test will be displayed in the upper right corner of each slide. And when the time expires, the test will be automatically terminated and all remaining questions will be considered as answered incorrectly.

### **Number of questions.**

Instructor may specify the number of question to be included in the test. If the specified number is greater than or equal to number of available questions, then all questions will be included. Otherwise, instructor will be given two options – select questions in sequential order, or select them randomly. If there is a large pool of questions then random selection could be a very quick and convenient way of generating dissimilar tests.

### **Test bank creation.**

The Excel template is so intuitive that entering questions and options is an extremely easy task – anybody who has ever used Excel for any purpose can do it.

### **Test or Review creation.**

The same tool can be used to create not only a test, but also a review. When an Excel file with test questions and choices is already available, it takes less than a minute to create a test or a review. Giving a test is effortless. A review displays questions randomly and prompts whether or not the student's answer is correct. This process repeats in a loop until the student clicks on “Quit” button.

### **Nothing to install.**

PowerPointTest consists of two template files only: *TestDataTemplate.xls* – an intuitive Excel template for entering questions and answer choices, and *TestBuilder.pot* – A PowerPoint template which actually creates a test or a review with just a few clicks.

## **THE ANATOMY AND PHYSIOLOGY OF PowerPointTest**

Test or review creation process consists of two steps - creation of a question bank (repository) in Excel using *TestDataTemplate.xls* template; and creation of a test (or review) itself using the

*TestBuilder.pot* template.

### Step 1. Question bank creation.

The *TestDataTemplate.xls* is an intuitive Excel template for entering questions and answer choices. Fig. 1. depicts the screenshot of the file. All you have to do is to open *TestDataTemplate.xls* template file, replace “Test Questions for ...” text in the first row with any text you wish (e.g., course name, test name, etc. ), then using the format of two sample questions presented in the template enter test questions, possible answer choices and mark correct choice(s) for each question. It is very intuitive.

Empty rows between questions are optional and could be used to increase the readability of your data. Save the file and you are done with the Step 1. The created file can be later modified by means of deleting questions, editing them, or adding more questions.

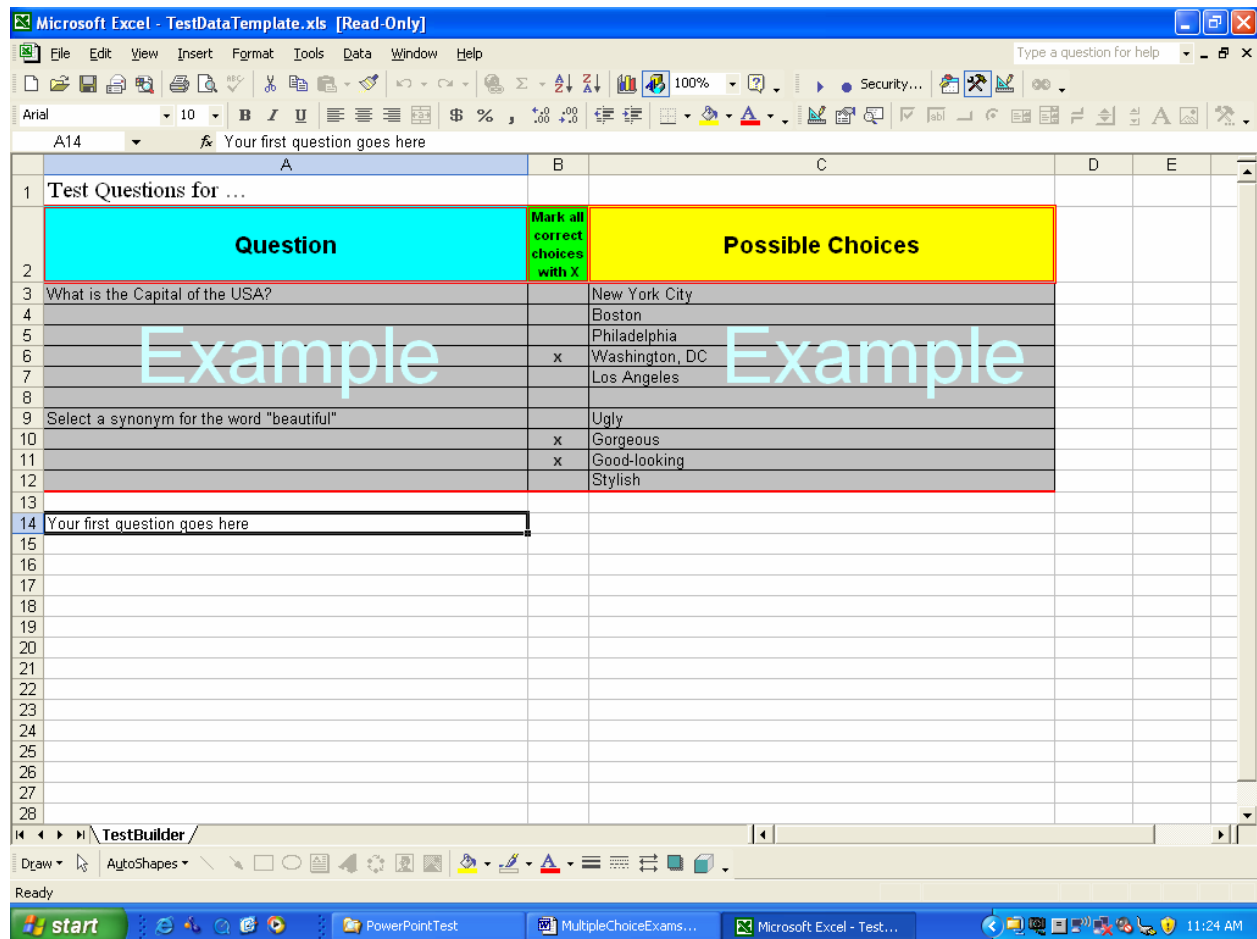


Fig. 1. *TestDataTemplate.xls* template file

### Step 2. Create a test or review.

When you have already created a question bank in Excel (Step 1), the test or review creation process takes less than a minute. All you have to do is to open *TestDataTemplate.xls*, replace texts on the first slide with any text you wish (the content of the top box will later be used as a

part of the name of the test or review), start the slide show, click the “Click to Start” and follow screen prompts. During the process you will be asked to:

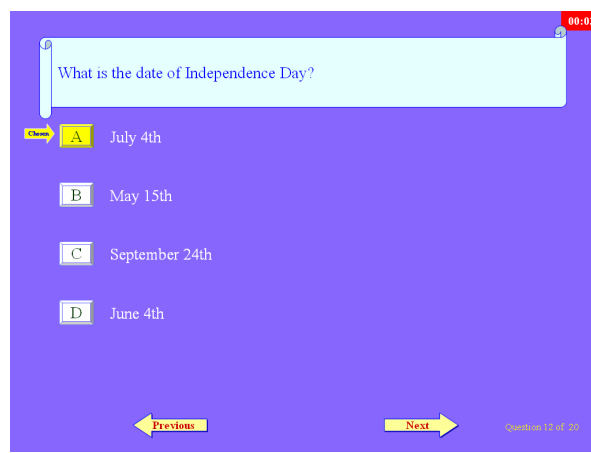
- Select an Excel file with your test questions (the file created in Step 1);
- Specify number of questions to be included in the test/review. If you were to select a number less than your total number of questions, you will be asked whether or not you would like to select the questions randomly.
- Select whether you want to create a review or a test.
- Specify a password (for a test) which will be used to protect student’s summary result file from unauthorized usage and possible alteration.
- Select whether or not you want to specify the test duration and enter the time (in minutes) if you decided to do so.
- Select whether or not you want to receive students’ grades via e-mail and, if so, provide an e-mail address.
- Select a folder where you want to save your test/review (Default is the folder where the template file is located).

If you have created a test then the name of the test file will be xxxxx-TEST.pps. If you have created a review then the name of the review file will be xxxxx-EVIEW.pps . In both cases “xxxxx” is the text which you have entered into the top box of the title slide (The original content of the box is “Replace with a test name”).

## HOW TO USE THE FINAL PRODUCT?

The final product created by *PowerPointTest tool* is a multiple choice test or review. It is a PowerPoint file containing a single slide for every question.

### Administering a multiple choice test



**Fig. 2.** A sample question slide with a selected option

Instructor may distribute a test file to the class (the same single file for the entire class.) in various ways, such as posting it in the shared folder, on the network drive, emailing it to

students, etc. In order to take a test, students will be asked to open the test file, start the slideshow, enter their names, e-mail addresses and start answering questions. As soon as students choose an answer (either by clicking on the corresponding A, B, C,... button, or on the desired answer itself), the “**Next**” button becomes “alive” (it was disabled) and students may click it to get the next question. By using “**Previous**” button, students can always go back and change their selections at any time. Fig.2. depicts a sample question slide with a selected option. When the last question is answered (or the specified time has expired), a summary slide is generated and displayed on the screen ( Fig. 3. depicts a sample summary slide). Then the summary file is created, saved on student’s local computer and automatically sent to the instructor via e-mail.

**Using a review created by PowerPointTool.**

A review file, created by *PowerPointTool* could be used as a powerful practicing instrument. In order to use it, student should open the file, run the slide show and start answering questions. As soon as an answer is selected, student receives an immediate feedback on whether or not the selection was correct. The feedback information stays on the screen for few seconds (default is 2 seconds), then disappears and the next randomly selected question appears on the screen (Fig.4. depicts a sample review slide with a feedback). This process repeats in infinite loop until student clicks the “**Quit**” button, which is available on each slide. When review is over, a summary slide is created and displayed.



**Fig. 3.** A sample summary slide



**Fig. 4.** A sample review slide

**CONCLUSION**

PowerPoint is a powerful presentation tool, but using VBA (Visual Basic for Application), we can turn it into a powerful learning and assessment platform as well. The tool presented in this paper – *PowerPointTest*, can serve as a tangible confirmation of this approach. This tool is the first yet successful attempt to enrich instructors’ teaching and assessment arsenal with new and easy-to-use instruments.

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