MICROSOFT EXCEL EXPERT CERTIFICATION MO-201: RESULTS, ANALYSIS AND KEY TIPS TO SUCCEED

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Abstract

Microsoft Excel skills are imperative in today's competitive market and the skill is highly demanded by businesses. The MOS Excel Expert Certification (MO-201) validates the competency that one should build to meet employers' expectations. The paper addresses the statistical mean rank difference in four skill groups of the certification test. Results of the four groups of the test were compared, using the Kruskal-Wallis's test. The null hypothesis of the equality of the means for different groups was rejected at the 5% level of significance. Because the null hypothesis was rejected, the Conover post hoc test was applied for multiple pairwise comparisons, to discern which of the sample pair combinations were significantly different. The paper examines some of the concepts of groups 2 and 3 questions where students struggled the most and rendered insights to overcome those hurdles.

Keywords: MOS Excel Expert Test; Non-parametric tests, Advanced Excel functions.

1. Introduction

To establish competency in technical areas, external certifications can play a very vital role. Certifications may help employers to determine the necessary skills required for different job tasks. Academic programs are revised and revisited from time to time to incorporate the necessary technical skills that employers demand. Certifications provide students a greater sense of confidence to compete and perform better to meet and exceed employers' expectations. The Association to Advance Collegiate Schools of Business (AACSB) stresses the importance of technology skills development in business education through its Accreditation Standards (AACSB, 2020). Data analytics skills that are necessary for business programs such as statistical/predictive techniques,

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prescriptive analytics, data base management systems, etc. can be performed with Microsoft Excel (Microsoft Corporation, Redmond, WA).

Academia and industry are in harmony for business undergraduate students in general and accounting/finance to have a solid knowledge of Excel skills. A great percentage of accounting/finance jobs require advanced understating of Excel skills (Formby et al., 2017). Microsoft has developed a certification test at the basic and an advanced level to measure skills to meet the industry requirements. For students to be proficient in Excel, they need to enhance their skills by passing the advanced level of the certification test. By getting the advanced Excel certification, they will fill the gap that the industry expects from fresh undergraduate business majors.

The purpose of this paper is to measure statistical mean rank differences among different groups of the Excel advanced certification test. The second objective is to address some of the most difficult and challenging group/tasks of the certification test and lessons learned to overcome those hurdles.

2. Review of literature

Excel skills are of paramount importance for many employers. Excel certification tends to help students enrich their professional profile and may land an excellent career path (Ngo-Ye and Choi, 2016). Since Excel is such an important tool, Gomillion (2017) and Bakir et al. (2019) stresses the importance of Excel skills both at the basic and advanced levels. Advanced Excel skills result in increased marketability and higher salaries for business students (Formby et al., 2017). As Excel is such an essential tool for business majors, the question arises of what advanced features one should grasp to satisfy employers' expectations. Reddy (2022) suggested lists of general Excel skills an employer wants to see in a business graduate. Formby et al. (2017) identified 21 necessary skills that are aligned with Microsoft Office Specialist (MOS) Advanced Excel certification test. The skills necessary to pass the advanced Excel certification test are divided into four groups and are as follows (McFedries, 2020):

Group 1.   Manage workbook options and settings (15 to 20%)

Group 2.   Manage and format data (20 to 25%)

Group 3.   Create advanced formulas and macros (30 to 35%)

Group 4:   Manage advanced charts and tables (25 to 30%)

The above-mentioned Excel skills can help students in career development, advancement, and higher pay incentives (Pearson, 2022). For accounting/finance majors embedding those skills are very vital. A section of Certified Public Accountant (Becker, 2022) exam uses real-life work situations to test in-depth knowledge and skills based on Excel formulas/functions.

Cory and Pruske (2012) surveyed 213 CPAs and 251 non-public accountants and ranked Excel skills as the foremost importance prior to employment. Pelzer and DeLaurell (2018) survey also reached to the same conclusion that Excel was the top skill that students lacked to meet employers' expectations. Certiport (2022) reports the median income of a Microsoft Office Specialist (with advanced Excel certification) is around $72,900.

3. Statement of the problem

As mentioned in the introductory section, the purpose of the paper is twofold: (1) to find out is there a statistical mean difference in four skill groups of the certification test, and (2) to throw light on some of the most complex concepts of the test that students must acquire to use the tool effectively and efficiently. The literature on the benefits of Excel certification is rich; however, no paper has addressed the statistical mean differences in the set of skills needed to pass the certification test. In other words, the objective of the paper was to highlight the advanced Excel skills where students struggle the most and endeavor to help in passing the certification test.

4. Method

Despite advanced Excel certification marketability, it is not very popular among students as the test is very arduous, with a national passing rate of less than fifty percent. This study involves the success rate of the different groups of the test and highlights and suggests the most difficult concepts students encounter while taking the test.

A section of a data analysis class consisting of 24 third-year business students, with a majority majoring in accounting, was utilized as the sample for this research during the spring semester of 2022. All students enrolled participated in the study. The class was taught by one of the authors of the paper and used the same materials and testing procedure to ensure consistency with the research methodology. Since there is no textbook written to cover all the topics of the Excel advanced certification test, lessons were created in the light of the MOS Study Guide (McFedries, 2020). All 24 students passed the certification test on their first attempt.

As the number of participants in the study was only 24, the Kruskal-Wallis non-parametric test was applied to check whether the mean rank of the four groups of the certification test was significantly different. Since Kruskal-Wallis does not assume a normal distribution of the data, the Shapiro-Wilk test was used as it has more power to detect the non-normality and is the most widely used method. Results of the four groups of the MOS advanced Excel certification test were compared, using the Kruskal-Wallis's test, for differences in the mean rank scores (Table 1). The null hypothesis of the equality of the means for different groups of the certification test was rejected at the 5% level of significance, showing that the four groups of the test had significant mean rank scores. The null hypothesis for the study was the following:

There would be no difference in the mean rank scores of the four groups of the advanced Excel certification test.

Table 1. Statistics for the four groups of the test.

	Average Score (%)	Standard Deviation	Shapiro-Wilk Test (p-value < 0.05)	Kruskal-Wallis Test (Sum Rank)
Group 1	95.83	9.52	2.06×10^{-8}	1706
Group 2	77.08	14.44	0.0086	877
Group 3	72.46	27.25	0.0061	998
Group 4	80.83	13.94	0.0030	1075
Test Result	Reject Null Hypothesis			p-value < 0.05

Source: authors computation

5. Results

The premise of this article was to take a statistical approach to analyze the details of students' struggles on the advanced Excel certification test and suggestions in which they need improvement. Kruskal-Wallis's test indicates that there is a significant difference (p<0.05) in terms of students' performance skills in different groups of the test. Because null hypothesis was rejected, Conover post hoc test was applied for pairwise multiple comparison, to discern which of the sample pair combinations are significantly different. The advantage of using post hoc Conover test is that it has more statistical power compared to Dunn test.

Table 2. Conover test statistics for pairwise multiple comparison

Group Comparisons	Absolute Rank Difference	Critical Difference
1 and 2	34.54	14.2169
1 and 3	29.50	14.2169
1 and 4	26.29	14.2169
2 and 3	5.04	14.2169
2 and 4	8.25	14.2169
3 and 4	3.21	14.2169

Source: authors computation

Table 2 presents a summary of the Conover test. The absolute rank difference column exceeds the critical difference in the first three group comparisons. The multiple comparison procedure shows that those pairs are statistically different. Statistically, the highest performance is group 1 results, with a nominal score of 95.83% and a sum rank value of 1706.

6. Discussion

The high score of group 1 questions is not a surprise as it covers straight forward topics like managing workbooks, preparing workbooks for collaboration, and configuring language options. The topics can be covered by looking at Excel options under the file tab such as formulas, language, customize ribbon, and trust center.

The hardest parts of the certification test are group 2 and group 3 questions with nominal scores of 77.08% and 72.46%, respectively, with lower sum rank scores compared to groups 1 and 4 questions. The required passing score for the test is 700 out of 1000. Although the nominal score in all four groups of the test was above the passing mark, students struggled with groups 2 and 3 questions. Group 3 nominal score was the lowest with the highest standard deviation. The question arises that why students' performance was marginal with those group questions.

Groups 2 and 3 questions are based on advanced conditional formatting, logical operations in formulas, what-if analysis, financial functions, troubleshooting formulas, and creating and modifying simple macros. Since many of those concepts are based on built-in functions, students struggle to understand the logic to apply those intricate functions. Some questions on the test are based on nested (combining multiple) functions to reach a logical conclusion. In the next few paragraphs, we have addressed some of the most difficult concepts that students struggled with in groups 2 and 3 questions.

Group 2 questions deal with fill cells using flash fill, format, and data validation, group and ungroup data, calculating data by inserting subtotals, removing duplicate records, and applying advanced conditional formatting. We noticed that students in general handled all the questions from the group quickly, except the ones on custom (advance) conditional formatting. It is based on using a formula or function to determine which cells to format. The common questions expected are highlighting cell values greater than the average, multiple conditions with modifying rules and highlighting a particular day(s) of a week. The advance conditional formatting rules mentioned above use a formula/function to determine which cells to format. To highlight cell values greater than the average, the rule will be based on the select cell value greater than the average of given cell values (select cell > average of given cell values). The average formatting technique was an application of a single formatting rule. To highlight cells with multiple conditions, use AND or OR functions. Once multiple conditions rules are established, they appear in the Rules Manager in a top to bottom order and conditions are tested and format applied in the order. Instructors should emphasize that Rules Manager stops if there is a conflict in applying formats. A conflict occurs if the rules are repetitive in nature. To highlight weekends, conditional formatting can be done with the help of WEEKDAY (<data range>,2)>5 function. The formula WEEKDAY returns a number between 1 and 7 that corresponds to a particular day of the week where 1 = Monday, 2 = Tuesday, 3 = Wednesday, 4 = Thursday, 5 = Friday, 6 = Saturday and 7 = Sunday.

Group 3 questions are primarily written on applying advanced formulas/functions. Key questions are about how to perform logical operations with multiple ranges and criteria, look up data, and financial functions. Questions on multiple ranges and criteria are written on the application of conditional functions such as COUNTIFS, SUMIFS, and AVERAGEIFS. The beauty of conditional functions is that there are situations in which a logical formula requires multiple criteria applied to multiple ranges. The test consists of at least one question on the application of the above functions. Instructors must explain the application of those functions with multiple scenarios that incorporate mathematical operators (=, >, <, >=, <=, <>) to complete arguments.

Questions on lookup data are related to VLOOKUP or HLOOKUP function. One can use the VLOOKUP/HLOOKUP function to find data in a table where data to retrieve is laid out vertically/horizontally. Although the Excel lookup functions can seem quite straightforward, it is very easy to get the wrong answer if students do not fully understand how they work. An important issue with the lookup functions is the use of the optional, fourth argument. It is a Boolean value (True/False) that determines how Excel searches for the lookup value. A good amount of time with numerous examples should help students to differentiate between the exact match (False) and appropriate match (True) application of the argument.

Financial functions such as monthly payment (PMT) and a number of payments (NPER) are advanced financial modeling skills that are important for accounting/finance majors. One of the intricate parts of the PMT and NPER functions is the time unit. The underlying unit of both the interest rate and the number of payments must be the same. Instructors must work with students to express the time period. If a scenario is with monthly periods, the given annual interest rate must be divided by twelve, and the payback time period must be multiplied by twelve.

7. Lessons Learned

The study is based on a small number of subjects as a result our observations are limited in nature. Nevertheless, students passing rate was perfect. While preparing students for the advanced Excel certification test and administering it, we made some useful observations and valuable insights on how to prepare students.

Excel certification is a time constraint test with six projects with multiple tasks. Familiarity with the test format is very essential to avoid wasting time understanding the instructions. GMetrix software (2019) is a very useful tool to familiarize students with the testing software. The software has two modes: Training and Testing. The difference is that the Training mode provides step-by-step help for each test question, with no time limit, while the Testing mode lets you experience the actual certification exams with timed practice scenarios. Our strategy with the software was that each student uses the software in Training mode twice and then the Testing mode at least two times. Every student scored over seventy percent when taking the practice test on the Testing mode

the second time. The only caveat with GMetrix software (2019) is that it is not cheap; however, it is a good investment to achieve desirable results.

Another key observation was about time management. The test has a time limit of 50 minutes. Though students were warned while practicing on GMetrix software (2019) about the time constraint, few students wasted time on questions that required some thinking process. Students struggling with questions should mark them for review that can be revisited before submitting the test for grading. Some students find the functions/formulas questions that were discussed in detail in the previous section very challenging. Instructors are advised to write short quizzes from time to time during the semester so that students can retain intricate concepts.

The Excel Expert certification class at our institution is in its infancy stage and is an optional class. However, there is a very likely possibility in the light of the new curriculum of the CPA exam that it will be a mandatory course for all accounting majors. The school developed the basic Excel certification class about a decade ago and after its inception, over 90% of students passed the certification test on their first attempt. Though all the students in the advanced Excel certification pass the test, it was a pilot test with only twenty-four individuals.

8. Conclusion

Excel is ubiquitous and indisputably one of the most important skills for every business student. Excel Expert certification test is very advanced and contains critical technical skills. The aim of the paper is to provide insights to educators as well as students who are interested in MOS Excel Expert certification test. With astounding success in the initial stage of the advanced Excel certification class, the goal is to continue improving the content and incorporate skills that are beyond the scope of the test. The intent of our college is to make the Excel Expert certification mandatory for all accounting majors soon, which is a major commitment. Any school taking the path should be willing to provide enough resources for educators who want to invest their time and energy to make the course rewarding. Since lessons were developed for the course and will be refined from time to time, we are willing to share our notes and experience with anyone who wants to take a lead in his/her institute. Developing lessons for the course was not an easy task. Publishing a comprehensive textbook to meet the goals and objectives of the advanced certification text will be a milestone.

One of the limitations of the study was the number of subjects for the pilot study. It will be interesting to find out what will be the results if it is applied to a larger pool of students. Also, it will be interesting to find out that how students perform with Excel Expert certification in advanced upper-level courses.

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