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The **Information Systems Education Journal** (ISEDJ) is a double-blind peer-reviewed academic journal published by **ISCAP** (Information Systems and Computing Academic Professionals). Publishing frequency is six times per year. The first year of publication was 2003.

ISEDJ is published online (https://isedj.org). Our sister publication, the Proceedings of EDSIGCON (https://proc.iscap.info) features all papers, panels, workshops, and presentations from the conference.

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INFORMATION SYSTEMS EDUCATION JOURNAL

Editors

Pandemic Shift: Impact of Covid-19 on IS/Microsoft Office Specialist Excel Certification Exam Classes: Remote Testing and Lessons Learned

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Abstract

The corona virus (Covid-19) caused serious havoc on society impacting all industries resulting in major changes in business practices, operations, and policy. In the case of academia, at a moment's notice, all universities that used face to face instruction were forced to move to an online format and make serious modification to successful courses. This paper documents a successful certification course structure and reports the experience and results of moving that course in Excel comprehension (certification) from traditional face to face to online. In addition, this paper provides a discussion into the strategies used for remote testing and teaching. Overall, the Covid-19 sections were not as successful as previous traditional sections. This paper concludes with lessons learned that can be helpful for future remote or online course deliveries.

Keywords: Covid-19, Remote Testing, Certification, Microsoft Excel, Analytical Skills, Pedagogy, GMetrix SMS

1. INTRODUCTION

On March 15, San Diego only had 8 positive cases and the rest of the nation were still having debates about the seriousness of the Covid-19 virus. At that time, many universities moved classes to a remote/online delivery method in preparation of lockdown and stay at home orders. By April 2020, the virus was full blown and saw the start of monumental change in higher education across the United States. On March 19, the state of California announced a stay-at-home lockdown order for 21 days. As shown in Figure 1, the entire United States became one of the 188 countries in the world that shut down all schools or localized them in some cases to avoid the spread of the virus while affecting 1.576 million children and youth affection the 91.3% of the world's student population by April 04, 2020 (Basilaia & Kvavadze, 2020). For the year of 2020, the country has 14.3 million students in public colleges and 5.12 million in private colleges (Statista, 2020). Out of the 5,300 institutions in the USA, there are 1,626 public colleges, 1,687 private nonprofit schools, and 985 for-profit schools.
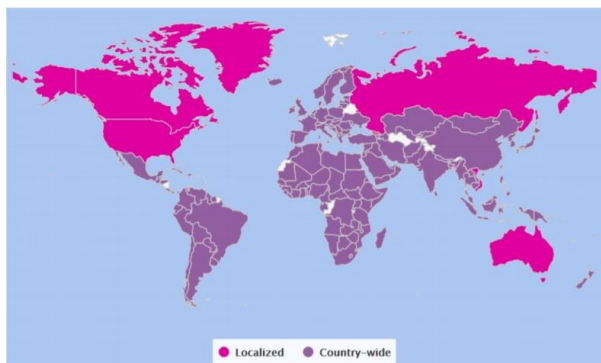
Figure 1 Countries that have shut down or localized schools in the world UNESCO Report

The pandemic has created a situation where students cannot go to school. Covid-19 has certainly forced almost all institutions to adapt extremely quickly, particularly in the area of moving to online education (APLU, 2020). This move caused universities to consider other factors such a technology hardware and bandwidth. Technology companies such as Zoom and Microsoft offered free use of the digital conference programs for classroom and meeting uses. Almost overnight all faculty and students were having to learn and adapt to new ways of classroom expectations and training.

Moving to remote instruction was easier for some areas, particularly those areas where learning was dependent upon synchronous human interaction. Thus, the features of the online format varied with the different type of subject matter.

On first impression, computing instruction would be considered to be a no-brainer decision for moving to remote. This is because many computing concepts could be taught asynchronous at any time. However, computing concepts and more specifically application training are more effective when students can have physical real-time one on one synchronous sessions.

The purpose of this paper is to communicate how Covid-19 has changed the delivery of our successful certificate classes. The paper is structured as follows. First, is a background discussion on the value of certification followed by the framework that compromise an entry level information systems courses that has a strong Excel certification requirement. Second, is a discussion of the performance of previous offerings followed by a dialogue on how Covid-19 and remote/online learning impacted the class. This area specifically examines the introduction of

remote testing and some of the teaching strategies that had to be employed in the online synchronous environment. The paper concludes with comparing the results between Covid-19 and pre-Covid-19 classes and providing lessons learned to be applied to future courses.

2. BACKGROUND

Technical proficiency is a desired or expected outcome of information systems. The concepts of an information systems (IS) course form the foundations of technical literacy which leads to information competence. Technological literacy is essential to compete in today's economy (Bakir & Dana & Abdullat, 2018). The ability to understand, use, and manipulate data to make decisions is an essential factor of information competence (Mandinach & Gummer, 2013). One way for determination or validation of competency is to create skillset exams that when passed earn the student a certification. In other words, Certification is a method of estimation of an individual's expertise via a standardized measurement instrument (Perks, 1993). These programs have been and continue to be popular among business and computer information systems programs. Certifications have a significant effect on the employability of employees (Carnevale, Rose, and Hansen, 2013; Claiborne, 2017; Hunsinger & Smith, 2009). Other research has shown employees feel there is a gap in technical skills (Lim, Lee, Yap, and Ling, 2016) that needs to be addressed by academia.

Certifications are one solution and these certifications also prepare students to compete in competitive job markets and showcase their marketability while they are still in school. Bartlett, Horwitz, Ipe, and Liu (2005), reported that certifications do play a role in hiring decisions. Based on the Pearson VUE Value of IT Certification survey (2019), findings showed employees benefitted from acquiring a certification. For example, 65% of the employees indicated a positive impact on their professional image, 35% received a salary increase, 28% received new job responsibilities a job, and 26% received a promotion.

The Microsoft Office Specialist (MOS) exam was selected because results of studies concluded, that 67.5% of participants believed that they benefited by having the certification and 56% answered that MOS certifications did, in fact, help them gain employment (Tarver, Tarver, Varnardo, and Wright, 2009). Excel was selected in our program as the certification vehicle because many of the upper division courses used the program, and because Excel MOS certifications were valued most positively would likely influence employers to hire a candidate (Claiborne, 2017). Researchers (Bakir, Dana, and Abdullat, 2018) have noted that advanced analytical skills, Excel, in particular those taught by MyEducator (MyEducator, 2020) result in increased marketability and increased compensation for graduates (Formby, Medlin, & Ellington, 2017). General knowledge of Excel that students may obtain outside of the classroom is no longer sufficient. Over 80% of business students claim their goal is to get a good paying job, and many businesses are requiring advanced Microsoft Excel skills (Formby et al., 2017). Furthermore, AACSB has also indicated a shift towards relevant skills such as Microsoft Excel in hiring of business school graduates (Gomillion, 2017).

Many colleges and universities have implemented MOS certification programs into their curriculum with success. Certiport (2020) highlights higher education success stories with very positive outcomes. Certiport' website reports how Troy University's MOS program enhances work skills leading to greater career success. They discuss how Bellevue program increased student satisfaction and job opportunities and how Northern Iowa MOS program validates student skills for professional development. Perhaps most relevant example was a special Certiport highlight (2020) on the University of Denver Daniels College of Business program as that university is very similar to the university where this study took place. Certiport (2020) highlighted how implementation of MOS Excel improved student performance, enriched recruiting power, improved student placement, and expanded the program.

3. DESCRIPTION OF COURSE PRE-COVID-19

Our Introduction to Information systems is unique because it has a strong IS managerial concepts component along with covering the full Microsoft Office Suite. The information systems management concepts section focuses on IS competitive advantages, IS security, networking, database, enterprise resource planning, electronic commerce, supply chain, customer relationship management, emerging IT topics (cloud computing, artificial intelligence) and ethics. The students engage in a lecture exam on concepts as well as assignments, and is in addition to the MOS exam.

While we cover the other three main MS Office suite products (Word, PowerPoint, Access) we

place a heavy focus on Excel. Our Introduction to Information systems course has offered the Certiport program since 2012. It started off with just one pilot and now we offer10-12 sections of the course each semester all of which require MS Excel certification (MOS). The MOS consists of three levels: Specialist, Expert, and Master. The Specialist is the exam selected for the Introduction course and we offer the Expert and Master for upper division courses. The MOS certification measures and validates Excel core skills in five topics: (a) create and manage worksheets and workbooks; (b) manage data cells and ranges; (c) create tables; (d) perform operations with formulas and functions; and (e) create charts and objects.

The Introduction to Information systems course is open to all undergraduates without any prerequisites, however it is required for all business majors. Lately, the course has been very popular with communication majors. The course utilized the Introduction to Information Systems by Rainer and Prince (Wiley) for IS lecture concepts, my educator for Excel assignments, and GMetrix for MOS preparation. MyEducator is an online textbook with interactive lessons and modules on Microsoft Excel and Microsoft Access. The students are responsible for purchasing the Wiley textbook and MyEducator. Gmetrix and the MOS voucher are covered by a student fee. The university is an authorized Certiport testing center and handles the proctoring.

GMetrix Skills Management System (SMS) is a practice exam engine, which is authored by GMetrix LLC, "a provider of educational tools designed to prepare individuals for the effective use of technology in the business environment" (GMetrix 2020). Tastle, et al, 2017, describes the GMetrix SMS as containing six exam "modules" that help prepare students for the certification exam. The first three are referred to as "Core Test" modules and the remaining three are referred to as "Core Project" modules. Each set of three increases in complexity. Additionally, each exam module may be taken in "training mode," which allows students to complete the module in their own time and which provides direction for the students to correctly answer the question, and "testing mode," which is timed similarly to the actual certification exam and no help or direction is available. "Core Test" exams are delivered in question-answer format, while "Core Project" exams are a set of cumulative instructions intended to produce a finished product, which is then graded. The "Core Project" modules very closely mirror the actual exam (which is also delivered in project format) so that

students are comfortable with the Microsoft exam interface and know how to work the keyboard. One can even make customized exams or homework assignments in Gmetrix. As students practice their skills on these tests, they build confidence, enhance their learning, and become familiar with the testing environment prior to the actual exams (Bakir, Dana, and Abdullat, 2018).

This course has the students work on approximately 9 homework assignments in MyEducator (6 Excel and 3 Access) and 3 specialized assignments. As previously mentioned, one can create custom assignments and tests that are specific to each student strengths and weakness. The course employs a pre, mid, and post assessment of Excel abilities both in testing and via Likert survey questions. There are also 3 individual class sessions dedicated towards training/testing of the MOS. The first session utilizes a GMetrix Core Project exam in training mode where students can use the help feature and are only limited by the time of the class. The second session has the students taking another exam with the ability to use help and they are forced to submit after a 50-minute time limit. The third session mirrors the actual MOS examination environment where the students take another different exam that is timed and there is no help available. Each practice exam session has a point value that aggregates with each session and the final MOS exam has a weight of 25% of the course grade. In the event the student does not pass the exam on their first attempt, they are allowed a second opportunity, however there is a max score of 80% allowed regardless of their second retake performance.

4. PRE AND POST COVID-19 RESULTS

Overall, the results of our class structure, pedagogy have been very successful as shown in Table 1. There was one anomaly in Fall 2016 where the scores dropped considerably. Exam question review, scores and testing equipment (coding) were analyzed to determine exact causation and were to no avail. Other efforts to contact Microsoft regarding error detection and correction went unanswered. The prevalent consensus is that in Fall 2016 Microsoft changed their exam format from a series of 1 item question tasks to a two-page, four-part interdependent project. This exam did allow for a reset function, however doing so was a complete reset as compared to the previous MOS version where only 1 question/task was reset. Also, the expert exams were considerably more challenging and different because one had to take

2 separate exams to prove competency. Subsequently, in Spring of 2017 a new revised project format was unveiled, which is the 7 different five-part mini project exams that is still being used. The reset function now only applies to one specific project as compared to the entire exam.

Excel Exam Results 2016-2018

	F16***	SP16	F17	SP17	F18
% PASSED	85%	92%	93%	95%	95%
% FAILED	15%	8%	7%	5%	5%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**
*** new version of MOS exam introduced/had issues corrected					
Result breakdown					
PASS 1st Take	62%	81%	77%	83%	85%
FAIL 1st Take	38%	19%	23%	17%	15%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Table 1 Excel Exam Results 2016-2018

Midway through the Spring 2020 semester the university was shut down under a state mandate lock down order and the rest of the courses were delivered remotely through synchronous Zoom sessions. Table 2 and Figure 2 show the percentage difference in MOS performance due to the Covid-19 changes in instruction. Overall, there was a substantial percentage decrease in first and final pass results between the two semesters. There was also a large number of students not passing (6 more) in the covid semester than in the non-covid spring 2019 semester.

MOS RESULTS	SP19	SP20	DIFFERNCE
FIRST RESULT PASS	**87.2%**	**74.0%**	**-13.2%**
FIRST RESULT FAIL	12.8%	26.0%	13.2%
FINAL RESULT PASS	**96.9%**	**87.2%**	**-9.7%**
FINAL RESULT FAIL	3.1%	12.7%	9.6%

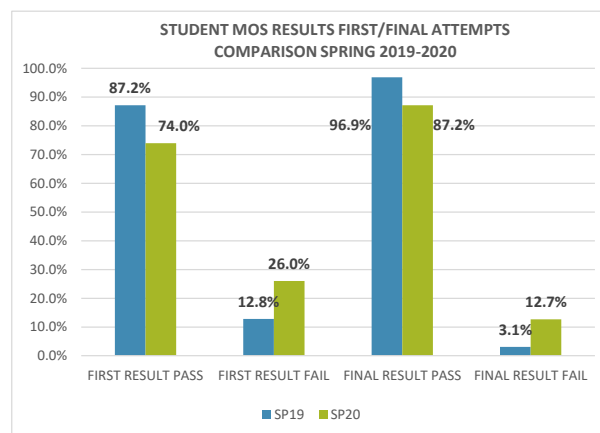**Table 2 MOS Comparison Results 2019-2020**

Figure 2 Student MOS Results SP 2019 versus SP 2020

The course also measures the students' knowledge of IS concepts. This is evaluated by a pre and post survey where the students self-evaluate their understanding, comprehension, and ability of several IS concepts. There was a percentage decrease in knowledge comprehension in most areas and the results are shown in Table 3 and Figure 3.

TERM	SP19 INCREASE	S20 INCREASE	DIFFERENCE (+/-)
COMPUTERS	**22.4%**	**16.2%**	**-6.2%**
WORD	**21.0%**	**13.4%**	**-7.6%**
EXCEL	**77.4%**	**64.6%**	**-12.8%**
ACCESS	**148.2%**	**82.4%**	**-65.7%**
POWERPOINT	**28.8%**	**11.5%**	**-17.3%**
WEB	**23.8%**	**13.1%**	**-10.6%**
HTML/CREATE	**54.9%**	**87.7%**	**32.7%**
NETWORK	**70.5%**	**93.2%**	**22.8%**
INFO SYS	**87.5%**	**95.4%**	**7.9%**

Table 3 PRE-POST Increase/Decrease of IS Concepts Knowledge
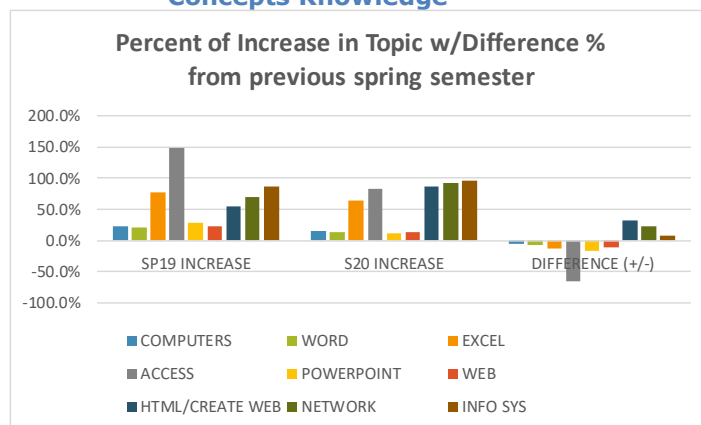
Figure 3 Visual Representation of Topic Differences

Lastly, there was a considerable difference in grade distribution and is shown in Table 4. Interestingly enough there was about the same number of A's and slight increase of C's, and a substantial difference in the B and D/F category.

Grade Distribution Comparison 2019-2020

Grade	ITMG 100 SPRING 19	ITMG 100 SPRING 20	Differece
A+, A, A-	25.80%	25.60%	-0.20%
B+, B, B-	54.80%	23.30%	-31.50%
C+, C, C-	9.70%	18.60%	8.90%
Combined D/F	9.70%	32.60%	22.90%

Table 4 Grade Distribution Comparison 2019-2020

5. DISCUSSION

As the different tables and chart indicate the Spring 2020 offering had much different results than the previous Spring as well as for most of the other semester offerings. Granted there was a significant amount of unrest and disruption in delivery and mental state that could explain a fair amount. However, this occurred in the middle of a 15-week semester and there was a large amount of resources made available to students to address their mental, emotional, and health needs.

One of the largest disruptions was the testing environment of the MOS exam. Thankfully, Certiport was able to provide exams and home service. This solution was unique and new as it allowed for a student to take the MOS exam at home, regardless of platform (MAC, PC, Chromebook). The setup procedure was simpler than creating a lab with Compass as the students could be assigned in blocks of 10, or they could arrange to have an individual appointment. During this particular semester the program was so new that Certiport was encouraging the block of 10, where the instructor would receive the URL exam link the evening prior. For the individual sessions, the URL are sent 1 hour prior to exam start time, although the appointment time is confirmed a few days prior to exam. This system worked relatively well though it did have drawbacks. The sessions were supposed to have a virtual proctor and in some cases the technology did not work. In addition, invariably there were technical issues with the exam delivery or in the process that caused the students to have to retake the exam. Unfortunately, there is no way to measure how prepared a student may have been or what their performance would have been if their exam had not been shut down. There is also no way to measure the increase in confidence or decrease in text anxiety that an instructor who proctors their own test can provide.

Another challenge was that majority of the students have MAC computers so they relied on the classroom, computing lab, or library to practice and complete their GMetrix. Actually, because the GMetrix only works on a PC platform, this reliance becomes mandatory for those students who only have Apple Macs. A remedy virtual machine software solution was created towards the end of the semester. We set up a site license for VM Fusion and Windows OS 10 for the students to install and load on their computers. Installation manuals, FAQ, videos, and personal sessions were created and a few students participated.

It is presumed that the lower scores in the MOS, the grades, and course comprehension is related towards the remote online delivery. While the courses were delivered synchronously at the regular scheduled time, many students decided to rely on the Zoom recordings. Zoom logs do provide some indication of number of access attempts, yet the data is not more robust than that. For example, it is not known how long they are watched, or how often the person skips around.

The Zoom sessions themselves present a challenge when one person is struggling with a technical Excel concept. Zoom allows for the ability to share screen and sometimes those who are already past the task or understand the problem find themselves frustrated and bored while the struggling student tries to keep up.

6. LESSONS LEARNED

One concept learned through several years of administering the MOS program is that things change and performances will vary. Fall 2016, saw the introduction of a new test and format, which over time, changes and adjustments to the schedule, assignments, and delivery led to previous if not higher level of results. The same can be said of transitioning the MOS exam and class from traditional face to face to remote/online. One of the main purposes of this paper is to provide some of the lessons learned in case future courses need or want to transition.

Lesson 1
Make certain students have access to a PC operating system with MS Office to run GMetrix. Our VM Fusion solution is feasible and does have challenges. It is hard to accommodate a large number of students particularly since the installation can vary per computer. We recommend having your university create a remote desktop program where students can log in and use cloud computing regardless of their own personal device. We petitioned our university and they created a system call guacamole (see Appendix). It compromises of different computer labs thus allowing for a wide range of software and not just MS Office.

Lesson 2
Read and register, so you can proctor your student's MOS Certification "Exam at Home" (https://certiport.pearsonvue.com/Educator-resources/Exams-from-

Home/ExamAdministrator_Exams_from_Home_ SelfService.pdf). This way you can be part of the testing experience as opposed to providing a link to the student and waiting to hear the results. It will decrease the test anxiety for the student. In addition, in the event of test malfunction you would be able to provide reassurance that it was not their fault, thus helping to keep their confidence level intact.

Lesson 3
Require attendance for any online sessions that are held in Zoom. Do not make the Zoom recordings publicly accessible even in student Blackboard or Canvas. Instead, keep the recordings and make them be available upon request. For even stronger assurance of material comprehension you could require a one-page video report from the student that summarizes the session.

Lesson 4
If possible, have an extra monitor and move struggling students to a breakout room while keeping an eye on the rest of the students in the main room. Better yet, create a breakout room and have a couple of students go to the room to work it out. In our classes, we seek to determine technical ability and pair stronger and weaker students together. This method allows for the stronger student to become more engaged when assisting the struggling student. If it is not possible to have an extra monitor or breakout room, one could have the struggling student perform the activity along with verbal commands from the instructor.

Last Lesson
Conduct midterm evaluation surveys and monitoring of grades. Keep attendance and participation records. The digital Zoom cannot replace the physical distance or the lack on real life in person interpersonal interaction. Thus, using other analytical tools can help provide warnings and clues to those individuals whose attention might be waning.

7. CONCLUSION
The main purpose of this paper was to convey the results and impact of Covid-19 on a successful IS class and MOS Certification Program. The transition from traditional face to face to remote/online was very challenging and many lessons were learned. This paper properly documents the experience as well provides insights for those who might have to make the conversion in the future. Course delivery, like life, is a journey and not a destination and more research and investigation are needed as the modes of course delivery and student learning continue to change.

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Appendix

RECENT CONNECTIONS

OH 122

BA 221

ALL CONNECTIONS

- 🖥 BA 221
- 🖥 BEC 112
- 🖥 BEC 307
- 🖥 OH 122
- ⊞ SCST 173
- 🖥 SH 205 Windows

Guacamole Remote Desktop