



## **The Development and Delivery of an Online Graduate Course: Lessons Learned and Future Direction**

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In meeting the growing demand for advanced technical knowledge among non-traditional students and young professionals, our university has recently developed an online Master of Science (MS) degree program. In this paper, we describe the approach taken in the development and delivery of a new course, Management of Information Technology Resources, in this program. The course had an enrollment of 15 students. Approximately two thirds of these students were enrolled in the new online program exclusively, while the remaining students were registered on campus and whose reasons for doing this course varies and include: course scheduling convenience, interests in course content, and time flexibility. The on-campus students did not benefit from any advantage due to their proximity to the instructor since all pedagogically related communication was exclusively addressed online via email or the messaging/chat/discussion features of the Learning Management System (LMS).

The material is presented from the perspective of the course developer and instructor. We outlined the content areas, the pedagogical techniques employed and discussed the performance of the students. Performance was assessed based on test results and participation in online discussions/forums. We also examined the students' attitudes towards online classes. A qualitative assessment was also done to learn about the differences in perceptions between the two groups of students; that is, on-campus registered students and off-campus (distant education) students who were all employed full-time while pursuing their studies. We outlined lessons learned and discussed how this will affect future offering of the course and the impact on the overall program.

### **Introduction**

A plethora of online programs are being offered across the nation in order to address the needs of individuals to gain higher qualification without seriously disrupting their current lifestyle. For profit institutions have led the way for the most part. However, in the past few years an increasing number of traditional non-profit universities have joined the band wagon as they realized the net positives for offering online programs. Babson Survey Research Group's annual survey<sup>1</sup> reports that the number of college students enrolled in at least one online course increased for the ninth straight year. This was a survey of more than 2,500 colleges and universities—including both nonprofit and for-profit institutions. This same study reports that more than 6.6 million students completed at least one online course in 2010, representing an annual increase of 10.1 percent<sup>1,2</sup>.

The significant rate of increase can be attributed to many factors; these include: cost effectiveness of online delivery, advances in LMS and multimedia technological teaching/learning aids, flexibility of course scheduling, time and space (location) flexibility for students and instructors, the potential of online courses to meet student learning objectives, and the potential for online students to match or exceed the performance metrics as compared to the traditional face-to-face lecture format. However, not all online ventures have been a success. For instance, the British Open University, one of the largest distance-learning institutions in the

world, created a partnership around the year 2000 with American universities with the intent of dominating the American market for online learning; however, after losing several millions they withdrew by 2002. Similarly, NYUOnline, which concentrated on corporate education and training, closed and consolidated its operation into its continuing professional education division after losing more than 25 million while never achieving enrollment exceeding 500 students<sup>3</sup>.

The success of our newly established online MS program depends to a great degree on the perceptions and attitudes of the current students. The majority of the research in online education has focused on determining whether students perform as well in online classes. Comparisons of online and face-to-face lecture formats indicate that on average, students perform at least as well in classes with an online component<sup>4,5,6</sup>. However, we are unaware of any research that has examined two groups of students (distant education and on-campus students) who are doing the same exact course. This study was motivated by our desire to determine the perception and attitude of the graduate students towards our online courses. Specifically, we wanted to assess a group of 15 students who completed the course to determine if there are any differences in performance and perception between the on-campus and off-campus students. We believe that the on-campus group, who are all doing other courses concurrently in the traditional lecture format, could be used as a baseline in measuring performance and gaining insight into students' attitude and perceptions. We were also motivated by the need to share our approach to other instructors and online course developers. Hopefully, the insight shared will assist others as they develop and deliver similar courses online.

The remainder of the paper will provide an overview of the preparation and delivery of our course, and describe how the students' performances were evaluated. In addition, the survey method, results and discussion will be presented. We conclude this paper with a summary of our findings and suggestions for the future.

### **Course Preparation & Delivery**

The course, Management of Information Technology Resources, is a newly developed course that was offered for the first time in Fall 2012 in the online masters program. The course focused on the following content areas: Concepts of Information Systems, Classification and function of Information Technologies, Business Applications, Development and Implementation of business/IT strategies, and Managing the challenges of business/IT technologies and strategies. The course was prepared and delivered in 14 weekly modules. Each module consists of weekly reading assignments, lecture slides, weekly quizzes, and weekly discussions. The weekly discussions were based on online research activities, case study questions or video clips that often included actors role-playing a business/IT scenario. All of the content was delivered via the Desire to Learn (D2L) learning management system.

The modules were opened to the students in a weekly sequential order. Once open the module contents remained accessible to the students for the duration of the course. However, weekly quizzes and discussions are closed at the end of the week. All the students were exposed and had access to identical learning materials. Also, the on-campus students did not benefit from any advantage due to their proximity to the instructor since all pedagogically related communication

was exclusively addressed online via email or the messaging/chat/discussion features of the Learning Management System (LMS).

Students' performances were assessed through weekly quizzes, weekly discussions, 4 tests, and a final examination. Quizzes and tests consisted of multiple choice, true/false and short answer responses. For the discussion, each student was typically required to submit 1 original comment and respond to at least two of the posts by fellow classmates. The weekly discussion was graded out of 10 points. While students did not gain points for the quality of the content of the post, points were deducted for trivial comments and for not submitting the required number of posts.

## **Survey**

A questionnaire was given to the entire class in order to gain insights into their perception and attitude towards taking courses online. It consisted of 22 questions of which 18 were assessed using the Likert Scale. For the remaining four questions, two required short answer responses and others were for informational purposes only and were used to divide the class into two groups: on campus and off-campus (distant education) students. An on-campus student is defined as one who was registered as a regular master's student. He/she had the following characteristics: physically visited campus on a regular basis, attended other classes on campus in a face-to-face format, and worked less than 35 hours per week. An off-campus student is defined as one who was registered as a distant education master's student. He/she had the following characteristics: never or rarely physically visited campus, attended other classes online, and worked more than 35 hours per week.

The responses to the questionnaire were evaluated in order to capture students' views on the following:

- i. Perception of overall effort required to perform successfully in online courses
- ii. Attitude towards online courses
- iii. Perception of the effectiveness of online courses in learning new material
- iv. Perception of individual's ability to perform successfully in an online course
- v. Attitude towards participation in online class discussions

The actual performance of the students was measured by their overall grade (total score out of 100) in the course. This grade was also used to compare the performance between on-campus and off-campus students.

## **Results and Discussion**

### Survey Results

There were 15 respondents to the questionnaire (the entire class). The results of the responses to the Likert Scale questions were summarized by computing the percentage of the class that selected each of the response options. The response options for each question were: Strongly Agree, Agree, Neither Agree nor Disagree, Disagree and Strongly Disagree. These results are presented in Tables 1-5.

From Table 1A and Table 1B we derive that though the majority of students (53%) spent more time on the course than they had initially anticipated 57% believe that the work load was appropriate. Only 13.33% spent less time on the course than anticipated; however, this may be due to their poor time management skills and not necessarily because they felt that the amount of time spent was sufficient. Further probing revealed that the same respondents who spent less time than anticipated on the course also thought that they did not spend the necessary time required to meet or exceed the course requirements. In all, 26.67% thought they should have spent more time on the course in order to meet the course requirements. The mean of the actual time spent on the course for the entire class was 6 hours per week.

Table 1A- Perception of overall effort required to perform successfully in online course

Statement #	Statement	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
3	The amount of work required in the course was appropriate	57.14	0	35.71	0	7.14
6	I spent more time on the course than anticipated	20	33.33	33.33	13.33	0
7	The time I spent on the course was sufficient to meet or exceed the course requirements	13.33	53.33	6.67	20	6.67

Table 1B- Actual time spent on course

Question	Class Average (hours)
On average, how many hours per week did you spend on the course?	6

In Table 2 we summarize the responses to several of the statements in the questionnaire that sought to reveal the attitude of the students towards online courses. We are cognizant that the responses are influenced not only by this course but also their experiences in other courses as well. Nonetheless, we desired to gain an understanding of their overall ‘feeling’ towards online courses. Statement 13, ‘Online courses make me uncomfortable’ and Statement 14, ‘I feel comfortable taking courses online’ are arguably similar. However, we were of the impression that statement 13 may give the student an opportunity to express discomfort with some aspect of online courses such as online discussions while statement 14 captures their overall comfort level with doing courses online. We determined that while 20% of the students experience some discomfort doing online courses, 66.67% were comfortable doing online courses and only 13.34% expressed that they were not comfortable doing courses online. We found interestingly that 46.67% preferred online courses to face-to-face courses. This is significant because 26.67% had no preference and only 26.66% preferred face-to-face. In responding to statement 19, ‘If I had an option I would prefer to do courses online rather than traditionally’, 40% prefer to do courses online, 26.67% had no preference while 33.34% indicated that they would rather face-to-face. Responses to statements 1, 2 and 3 hints at the reason why there may be such a strong preference for online course. From statement 1 we learned that 93.33% thought the course was

well organized while the remainder was neutral. Statement 2 indicates that only 6.67% thought that the course did not meet their expectations and Statement 3 indicates that only 7.14% thought that the course workload was not appropriate. These responses along with the flexibility an online course affords may explain the preference for online courses. Inversely, we could also argue that if the students thought that the course was not well organized and did not meet their expectations then their preference for online courses would decrease drastically.

Table 2- Attitude towards online courses

Statement #	Statement	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
1	The course was well organized	60	33.33	6.67	0	0
2	My expectations for the course were met	33.33	46.67	13.33	6.67	0
3	The amount of work required in the course was appropriate	57.14	0	35.71	0	7.14
11	I prefer online courses to traditional(face-to-face) courses	20	26.67	26.67	13.33	13.33
12	Online courses make me uncomfortable	13.33	6.67	6.67	33.33	40
13	I feel comfortable taking courses online	40	26.67	20	6.67	6.67
14	Online courses save time	66.67	26.67	0	6.67	0
15	Online courses work with my schedule	53.33	40	6.67	0	0
16	On courses allowed me to attend classes more frequently than traditional (face-to-face) courses	40	13.33	40	6.67	0
19	If I had an option I would prefer to do courses online rather than traditionally (face-to-face)	26.67	13.33	26.67	26.67	6.67
20	On-line enables me to take more courses than the traditional methodology in a year	28.57	35.71	21.43	14.29	0

From Table 3 we see that over 70% of the students believe they can learn the same amount or more in an online course in comparison with face-to-face format. Table 4 shows us that 73.34% of the students believe that they can achieve the same or a better grade in an online course, in comparison to a face-to-face course. Only 13.3% thought that they would perform worse.

Table 3- Perception of the effectiveness of online course in learning new material

Statement #	Statement	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
8	I believe that I can learn the same amount (or more) in an online course as in a traditional (face-to-face) course	33.33	40	13.33	6.67	6.67

Table 4- Perception of individual's ability to perform successfully in an online course

Statement #	Statement	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
9	I believe that I can make the same grade (or better) in an online course as in a traditional course	26.67	46.67	13.33	0	13.33

Table 5 indicates that while 30.77% express some difficulty in contributing to online discussions, 73.33% express that they were either comfortable or neutral in terms of participating in online discussions. However, 26.67% express that they may prefer face-to-face discussions. Their preferences seem to be influenced more by their personality type and communication ability than learning style. In order to gain a better understanding of how the students feel about online discussions, an open ended follow-up question was asked. The question requested that the students explain their response to Statement 18, which reads, 'I feel more comfortable contributing to class discussions in an online course than in a face-to-face course'. Below are some of the actual responses to this open ended question.

"I believe I had selected "strongly agree" to question 18. My reason is that I feel more confident exercising critical thinking without a time limit. I can gather my thoughts better. Whereas, in the traditional course, I may be tempted not to discuss anything because I am an introvert. Also, I believe there is a competing feeling/tone during discussion in the traditional course unlike online. During online discussions, it is easier to see the facts, and re-read as many times before responding, without any pressures like the instructor waiting for a response (time pressure, audience pressure, etc) during discussion in a traditional course."

"I am very social, so I am very participative in a classroom setting. Online discussions always feel like something I have to squeeze into my schedule and, therefore, they are not genuine. This format does, however, require involvement from everyone. For these reasons, I find the system to be better in some aspects and not so great in others."

"I feel that the online class format does not allow a person to get to know the others in the class. This makes me feel uncomfortable at times."

“My reasoning behind my response is that I feel more comfortable expressing my opinion through a discussion board than in person because I am not an excellent verbal communicator. I express myself better in writing than in oral communication.”

“I feel more comfortable participating in discussion online for several reasons. Let me list them:

1. I feel like I have more time to think on what I am going to say before I say it.
2. I feel I am not pressured into presenting my point really fast because someone else might be waiting to speak, or class time running out.
3. I feel more comfortable speaking my mind, with no worries of what other people will think of what I am saying, or of being judge.
4. The fact that I can read what I am saying gives me the opportunity to really organize my ideas, and put them in a more logical and easy to understand format. Also, I have the opportunity to correct my post before publishing.
5. I can also be more considerate of other people’s feelings.”

Table 5- Attitude towards participation in class discussion

Statement #	Statement	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
17	It is difficult to contribute to class discussions in an online course	7.69	23.08	15.38	46.15	7.69
18	I feel more comfortable contributing to class discussions in an online course than in a traditional (face-to-face) course	20	13.33	40	6.67	20

Performance Comparison of Off-Campus and On-Campus Students

The mean of the entire class overall grade was 84.68%. The mean of the two groups of students differ by less than 1%. This indicates that performance-wise the two groups were similar. Charts 1A, B and C show the distribution of the grades over the entire class, off-campus students, and on-campus students, respectively. Again, there is no significant disparity between the groups. Chart 1D clearly illustrates that the highest performing students, that is students who gained an A in the course, were evenly split between the two groups.

Table 6. Comparison of the performance mean for both groups of students.

	Entire Class	On-Campus Students	Off-Campus Students
Mean Overall Performance (%)	84.68	85.26	84.30

Chart 1A. Distribution of grades for entire class

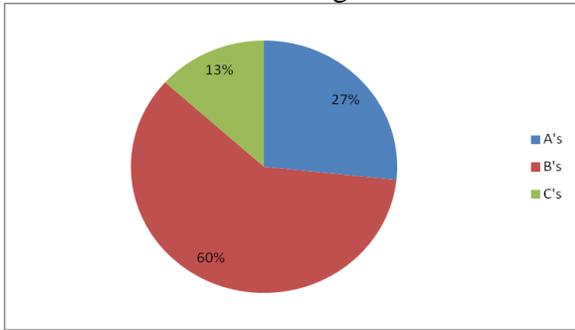


Chart 1B. Distribution of grades for off-campus group

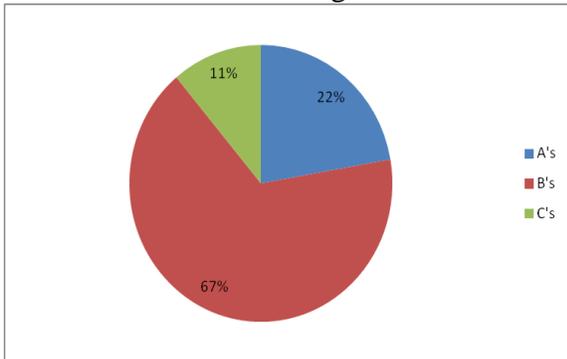


Chart 1C. Distribution of grades for on-campus group

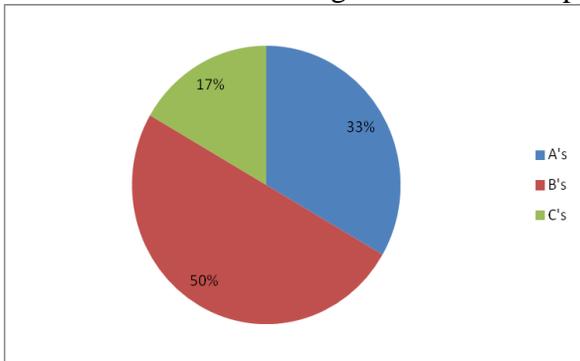
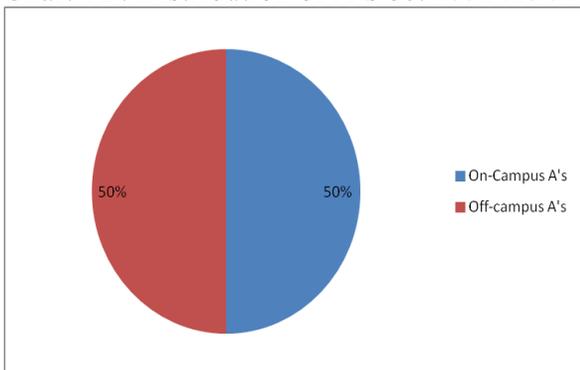


Chart 1D. Distribution of A's between the two groups (on-campus and off-campus)



### Impact of the use of the Learning Management System

The data gathered didn't allow us to determine the relationship between performance and/or learning with the time spent using the LMS. This was so because students sometimes logged on and remained inactive until the system timed-out their login session. As a result, the data was not useful in determining actual usage. However, there appears to be a positive correlation with the number of times the students logged into the LMS to access the course and their overall performance. This data was a bit 'noisy' so we hesitate to conclude that increasing number of access leads to better grades. However, we think it is reasonable to believe that increasing number of access indicates more involvement in the class, which was manifested in greater interaction among fellow students and more frequent participation in online discussions.

### Statistical Significance

Our total class size was 15 students. We do not make any attempt to use this small group to deduce any characteristics that would apply to all online students. However, since we did not take a sample but rather used the entire population of the class in our study, we were able to deduce some interesting findings about the performance and perceptions of our class. This we believe can serve as a starting point in understanding our students and will aid us in the design of future online programs. We also hope this research will aid other online course developers and instructors as they attempt to quantify their online students' satisfaction with their courses.

### **Conclusion**

We presented the findings of our study of an online graduate course. We did a comparative performance study of off-campus and on-campus students. Based on our findings, we determined that students are generally comfortable doing courses online and, in cases where there is an option, may prefer the online course of study. Initially, we were of the impression that our on-campus students would perform better. However, this is not the case. The off-campus students performed as well as students who visited the campus regularly, though they were employed full-time. It was also determined that preference for class discussions was probably influenced more by the student personality type than the format being used. Students in general tend to think that the course was well organized and their expectations were met. Also, students tend to spend more time doing the course to get the grades that they wanted than they initially thought. This indicates a misperception by students that doing classes online will save time; while it tended to be more flexible, it generally requires a lot more independent work on the part of the student. In the near future, we would like to extend our research to the entire program in order to ascertain the level of satisfaction across a wider cross-section of students.

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