To Lecture or Not to Lecture: Exploring Effectiveness of Active Learning

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**ABSTRACT**

We explore the effectiveness of activity-based instruction as compared to that of the PowerPoint-based lecture in a field experiment with MBA students enrolled in core courses at an American business school. Findings from quantitative and qualitative analyses show that students perceived activity-based instruction as more participatory, more challenging, and with a heavier workload than PowerPoint-based lecture. Students prefer a fair balance between PowerPoint-based lecture and experiential activities. To lecture or not to lecture is not the question; it is more about making classroom instruction more engaging and interactive by incorporating experiential activities.

**INTRODUCTION**

Lecture is one of the dominant techniques utilized by university professors (Beegle & Coffee, 1991), yet, it has been criticized for its passivity. For example, Derek Bok, former president of Harvard University stated: *“Efforts to develop critical thinking falter in practice because too many professors still* ***lecture to passive audiences*** *instead of challenging students to apply what they have learned to new questions.”* Perhaps in response to such criticism, business educators have evolved lectures over the years to incorporate and utilize a plethora of instructional aids ranging from chalk and blackboard to PowerPoint slides and projectors (Burke et al., 2009). In the past couple of decades, university lectures, especially at business schools worldwide, have not been able to escape the reign of PowerPoints as they have been associated with higher academic performance (Bartsch & Cobern, 2003). Sleepless nights and countless hours have been poured over PowerPoint slides, both by instructors to prepare and for students to print out. Debates on pros and cons of having lectures based on PowerPoint slides are heated as well (e.g., CITE). One of the main arguments against PowerPoint-based lectures is about how students become passive during lectures and are not intellectually stimulated (CITE).

In this research, we propose an alternative to improve PowerPoint-based lectures at business schools by incorporating interactive and experiential activities into the classroom instruction. Instead of merely criticizing the passive reactions of the students, we tested the potential of an activity-based instruction in a field experiment with MBA students at an ACBSP-accredited business school in the United States. We analyzed the findings of the field experiment both quantitatively and qualitatively. The current research contributes to the literature of business education by proposing potential solutions to the question of paramount importance to business educators everywhere: How can we help students learn more effectively?

**LITERATURE REVIEW**

When an instructor relies mainly on traditional lectures, one of the risks includes how students may not completely ‘understand’ the concepts or be able to apply them, despite the false sense of comprehension, which becomes amplified with recitation-styled testing methods (White, 2007). In particular, PowerPoint-based lectures, although prevalent and ubiquitous, are notorious for turning students into passive audiences, with the false sense of learning. Students instructed with PowerPoints did not perform as well as those students instructed with chalkboard and handouts, despite their overt preference for PowerPoints (Amare, 2006). PowerPoint-based lectures do not motivate students to take notes during class (Burke & James, 20xx). It is absolutely true that the usage of PowerPoint produces better student learning than using dry-erase boards (Hove & Corcoran, 2008), but the novelty for seeing PowerPoint slides in the classroom has already run out. Bullet-pointed lists in PowerPoints are abhorred by many, and the instructor’s tendency to read those lists is hated even more (Maxwell, 2007).

Many also argue that it depends on the instructor’s teaching ability, not on the usage of PowerPoint itself (e.g., Hardin, 2007). Moreover, it is not PowerPoint itself, but how PowerPoint is used in lectures (e.g., Giers & Kreiner, 2009). Many agree that it matters more to maintain student interest in the lecture topic (Clark, 2010). Current technology requires more up-to-date methods such as mobile phone polling (Voelhel & Bennett, 2014) to draw and maintain student interest.

Drawing from the literature in active learning, we conducted the current research to examine the effectiveness of activity-based instruction as compared to the traditional PowerPoint-based instruction. In the experiential learning literature, the more students participate, the more students internalize the learning. The learning should thus be deep learning rather than surface learning (Phillips & Graeff, 2014). This type of learning is actually more useful to their career, instead of just reading a book or comprehending a fact. Moreover, when students are asked to teach each other, they learn better (Bargh & Schul, 1980).

Consistent with this line of reasoning, the literature suggests several methods to make learning more active. Experiential and active learning in business education has proven its effectiveness in several disciplines of business (e.g., accounting (Phillips & Graeff, 2014), business statistics (Hakeem, 2001), marketing (Hazari et al., 2013), economics (Ball, 1999), business law (Gershuny et al., 2012), and operations management (Polito et al., 2004)). Several methods have been suggested: in-class simulation (Phillips & Graeff, 2014), projects (Hakeem, 2001), blogs (Hazari et al., 2013), in-class exercise (Ball, 1999), impromptu presentations (Thompson et al., 2012), mock trials (Gershuny et al., 2012), in-class mock experiential learning activity (Polito et al., 2004), etc.), real-time cases (Theroux, 2009) and crossword puzzles (Lin & Dunphy, 2013). In this research, we focus on one type of active instructional method, which we term as activity-based instruction. It is similar to impromptu presentations as presented by Thompson and colleagues (2012).

Metrics in the literature to examine the effectiveness of student learning commonly include exam scores (e.g., Hakeem, 2001; Hove & Corcoran, 2008) and student preferences (Theroux, 2009). One metric is to see how challenging students perceive the course to be. If students are not perceiving the challenging nature of coursework, there is no way for them to be pushing the envelope and to think outside the box to learn. Thus, students show higher levels of learning where faculty academically challenge them (Umbach & Wawrzynski, 2005). The metric that measures the degree of how challenging a course is therefore is an important metric we will examine in the current research.

In this research, we aim to investigate the effectiveness of the experiential and active learning as compared to the instructional method of utilizing a PowerPoint-based lecture. We propose that what is important in enhancing student learning is the methods that involve and engage students to become more active in their thinking. We report the findings from a field experiment analyzed both quantitatively and qualitatively, and conclude with suggestions for future research and practical implications for business educators.

**METHODS**

In order to assess the effectiveness of activity-based instruction as compared to lecture-based instruction, we conducted a field experiment for a semester at a small private university in the northeastern seaboard of the United States. As the two instructors who taught at the MBA program of the business school, we decided to assess our teaching methods of the two core courses in the MBA program and compare the student perceptions of the instructional methods. We labeled these two different classes Course A and Course B (2 sections each).

Consistent with the purpose of this research, instructors of these courses taught the courses differently. The instructor of course A was primarily driven by the in-class activity and refrained from lectures using PowerPoints. Specifically, the instructor divided the class into small groups of 3-4 students in every class, and gave them a business problem to which each group had to research and prepare an answer within a short period of time, present to the rest of the class, and be ready to explain and defend their decisions. In contrast, the instructor of course B stayed with traditional lectures using PowerPoints. The instructor provided the PowerPoint slides and explained the concept slide by slide in every class interspersed with student break-out discussions. Aside from this main difference, both courses employed typical course components as most business courses: group projects, case analyses, and assessments of quizzes and exams.

Within the period of two weeks towards the end of the semester (week 12 and week 13 during the 15-week semester), students were asked to provide their honest opinions of their experience thus far by answering an online survey. The survey contained closed-ended responses that revealed student perceptions of the course characteristics, effectiveness of various course components, and evaluations about the instructor, as well as open-ended responses regarding suggestions to improve the course and feedback about the current experience.

**DATA AND ANALYSIS RESULTS**

A total of 70 responses were collected from the students taking these two classes in four sections in the fall of 2016. All responses were anonymous. On average, students reported working fairly hard for these courses, claiming to spend about 7 hours every week on the coursework outside the class. As the courses were core courses of the MBA program that are usually taken in the first year of the program, student concentrations were evenly distributed and reflected the distribution of the overall program. A detailed distribution of the student concentrations is shown in Table 1.

**TABLE 1**

**CHARACTERISTICS OF THE RESPONDENTS**

|  |  |
| --- | --- |
| Concentration | Number of Respondents |
| Accounting | 5 |
| Analytics Intelligence | 8 |
| Finance | 21 |
| Human Resources | 8 |
| International Business | 1 |
| Management | 1 |
| Marketing | 4 |
| Other | 5 |
| Undecided | 10 |
| Unanswered | 7 |
| Total | 70 |

**Contribution to Learning by Course Component**

Students evaluated how much each course component contributed to their learning in the course. Importantly, students perceived the contribution of the in-class activities significant to their learning (74%). This was the most highly ranked component, compared to projects, case analysis, participation, lecture, and quizzes/tests. As can be seen in Figure 1, the top instructional components students perceive as highly significant in enhancing their learning all share experiential and active characteristics (in-class activity, case analysis, projects and participation). Lecture comes in afterwards.

**FIGURE 1**

**CONTRIBUTION TO LEARNING BY COURSE COMPONENT**

**Activity-based Instruction vs. Lecture-Based Instruction**

Sixty-seven usable responses came from 18 students from section 1 of course A, 21 students from section 2 of course A, 12 students from section 1 of course B, and 16 students from section 2 of course B. As we found that there were no significant differences between the two sections of each course, we collapsed the sections together, in order to compare the Activity-Based course against the Lecture-Based course.

As can be reasonably expected, the influence of the instructor was at work in our field experiment. In order to examine the effect of class instruction based primarily on activities versus that based on lecture, we teased apart the influence of the course components with that of the instructor. In order to control for the influence of the instructor. we used the variable of perceived effectiveness of the instructor as a covariate in conducting a MANCOVA. The dependent measures of the MANCOVA are described in Table 2.

 The overall model was significant at *p*-value of .003, (partial ε2 = .323). Details of the contrast reveal that students perceived the activity-based learning to require a lot more participation (*M*s = 4.5 vs. 3.8, *p* = .010) than they usually expect from a business core course. Accordingly, the perceived workload was heavier (*M*s = 3.9 vs. 3.2, *p* = .003). Overall, the course was perceived as more challenging (*M*s = 4.0 vs. 3.0, *p* = .001). The details of the analysis are shown in Table 3.

**TABLE 2**

**DEPENDENT MEASURES OF MANCOVA**

|  |  |
| --- | --- |
| Dependent Variable | Description |
| Topic | The topic of the course is very interesting |
| Participation | This course requires a lot more participation than I thought |
| Workload | The workload of this course is very heavy |
| Reading | This course requires me to do a lot more reading than I expected |
| Challenging | This course has been a lot more challenging than I expected |

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**TABLE 3**

**ANALYSIS RESULTS OF MANCOVA**

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Activity-Based | Lecture-Based | p-value |
|  |  |  |  |
| Topic | 4.3 | 4.2 | .412 |
| Participation | 4.5 | 3.8 | .010\* |
| Workload | 3.9 | 3.2 | .003\* |
| Reading | 3.8 | 3.3 | .112 |
| Challenging | 4.0 | 3.0 | .001\* |

*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
\* Statistically significant at .05*

**Qualitative Analysis**

In the online survey, participants were given the opportunity to anonymously enter qualitative feedback in four freeform text fields covering what was working well, what was not working well, suggestions for improvement, and miscellaneous notes. The process for developing these questions was straightforward as they were intended to provide sufficiently open- ended questions to allow the students to either extend their feedback or open the dialog to additional feedback the researchers had not previously considered. To avoid bias, references to specifics about course subject matter and the instructors were removed (Creswell, 2007; Glaser & Strauss, 1967).

Survey data were downloaded into *Microsoft Excel*, the freeform text fields were printed and margin notes recorded. These margin notes were then grouped into a series of open codes that were further analyzed for common themes and grouped into axial codes. This process yielded 182 open codes that reflected general feedback about the phenomenon under study. These open codes facilitated the identification of twenty-four axial codes based on common themes within the open codes. Complete frequency results of the qualitative coding are included in Table 4.

The axial codes were further assessed to ascertain the selective codes that comprise the central phenomenon, or the primary theme around which the other axial codes concentrated. As expected and consistent with the focus of our study, two axial codes, “lectures” and “student interaction,” emerged with more open codes (22) than the rest. Since these two codes represented the participants’ most emphatic voluntary feedback by a wide margin they were considered the selective codes while the remaining

**TABLE 4**

**COMPLETE FREQUENCY RESULTS OF QUALITATIVE CODING**



axial codes were considered critical success factors (Creswell, 2007; Glaser & Strauss, 1967). Figure 2 lists the top nine axial codes in descending order by open code tally.
 The following are the conclusions drawn from this analysis. Participant feedback is included to support each conclusion with minimal grammatical modification from the source material. It is instructive to focus on the two selective codes, lectures and student interaction, since they received the most emphasis in the participants’ feedback. In addition, perceptions about group work is also included since group work requires active student interaction.

**FIGURE 2**

**FREQUENCY OF QUALITATIVE CODING**

*Student Interaction.* Students appreciated courses that included student interaction:

*I like interactive classes [more] than boring lectures that makes us feel lazy because it’s too difficult to hear for 2hrs 30 mins so the class was interactive so I just loved it.*

*This class is interesting and it’s more interactive and practical than book reading…*

The participants also appreciated courses that combined lectures with interaction.

*Prof, possibly cut down the length of the PowerPoint slides and make the class more interactive.*

*The whole atmosphere and interaction between students and teacher has been motivational.*

*Group Work.* While several participants expressed dislike for group work because they did not enjoy relying on others most feedback was positive.

*…[I] love the group activities in this course and talking with everyone to understand the material.*

 *I like the collaboration with the other students.*

 *The group project would be my favorite part in this course.*

The combination of quantitative and qualitative analysis in mixed methods studies such as this provides additional depth where the qualitative observations provide texture, context and insight for the quantitative findings (Cunningham, Weathington & Pittenger, 2013). Here students exhibited equal passion for both active, engaging and participative activities and lectures. It appears reasonable to conclude delivering both will provide optimal impact.

**LIMITATION OF THE CURRENT RESEARCH**

The current research examined the effectiveness of experiential activities as compared to the PowerPoint-based lectures in a field experiment setting. As the participants of the experiment were students who actually earned grades for their MBA program as a result of taking the core courses, the external validity of the field experiment is extremely high. However, the internal validity is inevitably low, due to several confounds. One is regarding the discipline of the courses taught in the field experiment. It is well-known that students learn differently depending on the discipline of the material. It may be that activity-based instruction was well-suited for Course A, but it may not suit Course B. Similarly, instructor characteristics may have played a role. Although we controlled for the instructor effectiveness perceptions in our analysis, the instructors in our field experiment were very different individuals with distinct teaching styles. It is possible that the instructor of Course A was better-suited for activity-based instruction whereas the instructor of course B was relatively more effective for lecture-based instruction. Lastly, the current research did not collect data on detailed characteristics of the studied student populations. For example, preferences regarding instructional methods and various learning styles were not considered in our analyses. It may have been possible for an American student to react more favorably toward activity-based learning whereas an international student may have preferred PowerPoint-based lecture. Alternatively, students may have had different foundational capabilities for learning, which may have produced the bipolar responses in our qualitative analysis. Responses were vastly disparate regarding grading, quizzes, case studies and readings. Finally, since these courses were delivered on campus in a classroom setting it would be interesting to replicate this study with online courses to confirm if these conclusions hold.

**DISCUSSION**

Throughout both the quantitative and qualitative analyses, it became clear that students in the MBA program benefit from having more active and interactive course components rather than or in addition to PowerPoint-based lectures. Students perceived the activity-based course to be more participatory and more challenging, compared to the lecture-based course. The differences were statistically significant. This pattern was consistent with the qualitative analysis results where more interactivity was requested by students.

Given the notoriety of the PowerPoint-based lectures in the literature, it is intriguing to discover that the difference between the PowerPoint-based lecture and activity-based instruction was no larger than what was found in the field experiment. It is interesting that students do not want a course entirely composed of activities alone. Students asked for a balanced course structure where interactive and engaging lectures accompany several experiential activities. Interactive lectures improving PowerPoint-based lectures incorporate content-based questions (Giers & Kreiner, 2009). It is worthwhile to note that not all lectures are equal. Participants did not appreciate long lectures without student interaction, whereas they also confirmed facilitating student interaction without lectures is ill advised. Engaging, effective lectures should be balanced with equally engaging, meaningful student interaction.

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