CAN FINANCE EDUCATION BENEFIT FROM ONLINE COLLABORATIVE METHODS? AN EXPERIMENT

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ABSTRACT

Aim/Purpose	We introduce interactive and collaborative learning tools into a "traditional" finance course and collect feedback from the students concerning satisfaction, engagement, and overall learning. The aim is to show that collaborative learning methods have a place in finance academia.
Background	Finance education still relies on the traditional education model. We implement a collaborative learning method in a Finance course to measure its use on the topic.
Methodology	We conducted two peer-to-peer sessions in a class environment, Following the two tests, we released a survey to collect information about the tool's effectiveness. We received 42 responses out of a population of 57.
Contribution	Our case study aims to bridge the gap between the use of collaborative learning methods and the academic learning environment of finance.
Findings	The learning tool implemented was well received and provided a significant benefit to the students in the class, per the survey.
Recommendations for Practitioners	We recommend further implementations of collaborative learning methods in finance, and their injection into other traditional courses to better study their effectiveness.
Recommendation for Researchers	Experiments in different courses of the same field as well as different fields and different academic schools is needed to fully understand the capabilities and limitations of the collaborative learning tools.
Impact on Society	Moving away from the traditional academic model into an interactive and collaborative framework can help expand and extend the reach and effectiveness of education.
Future Research	Research on the tools is needed to fit this learning approach to the multiple fields of academia (if any are needed).

INTRODUCTION

THE EVOLUTION OF TECHNOLOGY

In this case study, we conducted two session of peer-to-peer education in a university classroom setting to a class of 57 students. After the completion of the two sessions the students were asked to complete a survey concerning the benefits and advantages of the use of the collaborative learning tool; 42 students completed the survey and their answers were used as the results for analysis. The finance course in question is a 2nd level finance course whereby most the students are finance majors and, therefore, directly tied to their field.

Even the way we assimilate and process information has changed radically with the advent of technology (Restak, 2003). The introduction of the internet and the practically free cost of publishing knowledge and information has proliferated the content available to the masses. This expansion has also led to a shorter attention span as people have less time to spend on a single piece of information to better manage the sheer volume of it.

While the success has been prominent in certain areas of technological implementation, there are benefits to the use of information technology such as its uses in the development of skill sets in learning, as well as the use of online technologies and the utilization of technological tools and techniques for the purpose of teaching and administration (Kosakowski, 1998).

TECHNOLOGY AND EDUCATION

Given the rising cost of education, including the amount spent per student at universities across North America (Bowen, 1980) and given the benefits offered by technology for higher education in terms of lowering costs and enhancing the reach of higher education (Bates 2000), it seems there are untapped opportunities with regards to the use of different technological methods to further the cause of academia.

However, to this day the predominant form of higher education is the traditional kind, with instructors lecturing a class and instructing students in the same input output relationship that has been used traditionally (Buabeng-Andoh, 2012). This dearth of adoption of technology in education stems from several factors, such as a lack of confidence, lack of ICT skills for teachers as well as restrictive curriculums. Therefore, experimentation in alternative methods of education and the establishment of ICT based courses in previously traditional settings is needed to increase confidence and adoption of such technologies. Considering the current situation and the proliferation of online universities as well as the creation of online courses in traditional universities, thereby creating a "click and mortar" university, there seems to be a need for a second revolution in information technology, namely, one that moves away from the traditional paradigm, whereby information is created, reviewed and evaluated at speeds and scopes that reflect the current state of information generation in the world around us (Beldarrain, 2006).

The system of education known as collaborative learning has many forms and scopes and poses multiple benefits as well as challenges that technology has been trying to resolve (Keppell, Au, Ma, & Chan, 2006). The collaborative learning tool we used in our classroom setting consists of an in-class web based activity during which students are tasked with creating, evaluating, and attempting to answer the questions created by their peers.

While some universities and departments have begun implementing tools and techniques, its spread has been thus far limited across faculties (Buabeng-Andoh, 2012). Some forays have been made in the field of mathematics, but thus far we have limited application of these techniques in a hybrid setting, i.e., in a setting where the content being created involved a combination of language and sub-

ject matter knowledge as well as the implementation of mathematics (Swan 2006). This case attempts to expand the reach of technology assisted collaborative learning in Finance education.

BACKGROUND

COLLABORATIVE LEARNING

The notion of collaborative learning is rather recent; one of the earliest and most substantive works on collaborative learning is the book titled "Collaborative learning: A sourcebook for higher education" (Goodsell, 1992). This early work introduced the topic of collaborative learning in terms of higher education and bound together multiple articles covering the different stages of collaborative learning from the general introduction of the concept to the evaluation in a classroom and the research at the time as well as the limitations of the current findings.

While the previous work (Goodsell, 1992) discussed the general concept of collaborative learning, its uses and importance in the world as well as how effective its approach can be in a real-world setting grew. Particularly, the research started to move away from the general introduction of the topic in general to specifying its distinction in terms of not only what the term means but also what it does not, namely, the distinction between collaborative learning structured in terms of a comparison to the traditional "direct learning" approach (Lehtinen, Hakkarainen, Lipponen, Rahikainen, & Muukkonen, 1999). Another research publication around the same time (Springer, Stanne, & Donovan, 1999) led a study concerning the use of SMET courses and programs in terms of technology, mathematics, and science; the study showed that the net effects of collaborative learning were considerable and lead to a better appreciation of learning and understanding in general, therefore, providing a net long term gain in terms of education. Around the same time, researchers were tackling the issue of collaborative learning from a psychological and cognitive perspective (Dillenbourg, 1999).

As knowledge become more apparent and information more available on the nature of the learning method and its advantages, research evolved to study the cases and granular conditions involved in the success or failure of the collaborative exercise and what modifications would need to be implemented to optimize the efficiency of the system. Among these factors was the inclusion and discussion of learning styles, whereby the research would suggest that the different learning styles of students are an important factor when considering collaborative learning and the formation of teams and groups for the exercise (Julie Yazici, 2005)

Another major contribution offered by the learning approach is that of changing the way students view and interpret information, namely, the ability of moving away from viewing information as separate and isolated entities to a more holistic understanding of the information as being small parts of a big whole that are all interconnected (Swan 2006).

PEER-TO-PEER LEARNING

Peer-to-peer is a branch in the tree of collaborative learning, whereby we establish a dual relationship between instructor and student such that students play both roles at different points in time. Some of the main issues discussed regarding the technique concern the setup of the remuneration scale as well as the perspective of how collaboration is viewed in the confines of a classroom, namely, if collaboration is cast in a negative light then it will be much more difficult to achieve a gain in the implementation of the tool (Boud, Cohen & Sampson, 1999); there is also the distinction between peer-to-peer collaboration and tutoring; the first for intellectual discovery and the second for drilling into the details (Damon, 1984)

CONTRIBUTION

Our contribution spans multiple levels; First, we develop an online collaborative learning tool where students create, evaluate, and answer their own questions. Second, we attempt to create this tool to be robust to both qualitative as well as quantitative questions (as is usually the case in finance). Third, we setup a remuneration scheme to overcome the disadvantages of collaborative learning. Finally, the development of this tool and its application in a finance classroom setting aims to increase confidence in collaborative learning among faculty and students and increase the adoption rate in the field.

THE TOOL

The peer-to-peer learning module consists of three components internally, each designed to represent a different stage of the learning process, from creation to evaluation and then to the test itself. The first stage is meant to help the student better understand the material and get engaged in the mindset of content creation, thereby engaging the creative aspect of the education process and allowing for the higher levels of understanding and knowledge to take place. The second stage is meant to allow the students to see the questions and answers provided by their peers and to rate those questions based on fairness, clarity, and difficulty. This step also allows the formulation of feedback on the questions created by the students, which leads to stage three, whereby a test is generated from the pool of question created and evaluated by the students, and the latter take the test and are graded based on their answers. This allows the students to test their knowledge and comprehension of the material relative to their peers and understand at which stage of the learning and understanding process they are currently.

The first stage is the content creation component, whereby students are asked to create several questions each and input them into the system; the system supports multiple types of questions such as multiple choice, true and false, as well as essays. For the purposes of the session, we limited the students to multiple choice questions due to the nature of the finance course, and in stage 1 students were asked to generate three questions, the difficulty of these questions was not preset or required but rather open to the discretion of the students themselves. The grade of the students on the first phase was based solely on the number of questions submitted relative to that required, rather than on the quality or accuracy of those questions.

The second stage pooled the questions created in the first step and redistributed them to students as fifteen questions that they must evaluate on the basis of fairness, clarity, and difficulty. The answers to those questions were displayed to those students during their evaluation to better understand the true level of clarity of the questions at hand. The grading for this component was also participation based and students did not receive penalties for misjudging question difficulty or for having their questions judged of poor quality

The third stage pools together the information gathered from the first stage as well as the rating of these questions, which was gathered in the second stage, and generates a common exam offered to the entire class and consisting of 9 questions, 3 of each difficulty: easy, medium, and hard. The score on the exam consisted of 70% of the final grade while the second and first stages consisted of 15% each. The students did not know which of their classmates had created the questions.

The tool's limit of only multiple choice helps address the issue of qualitative and quantitative question discrepancy as both can be fit into this category in a manageable and calculable way. The first two stages were participation based to resolve some of the negative issues of collaborative learning whereby remuneration can deter students from true collaboration; the issue however with the use of this strategy is that it created the moral hazard of students being able to submit low quality questions and of reviewing questions in an inaccurate and unethical manner. To deter these types of behavior, we create the stage 3 test which is the bulk of the grade and which students must answer; this en-

courages students to both write good questions as well as to rate the questions fairly since they will be receiving these questions in the generated test in stage 3.

DATA COLLECTED

Two sessions of peer-to-peer education were conducted in the classroom during the semester; the first was in week 5 of the course and 1 week before the first midterm while the second was during the 9 weeks of the course and 1 week before the second midterm. In both cases the students were given adequate notice, and the dates for the peer-to-peer session was posted in the course syllabus. Physical attendance was required to complete the activity and there was a class participation rate of about 80% for both peer-to-peer sessions combined. Both sessions represented 10% of the final grade for the course.

Following the completion of the learning sessions, a peer-to-peer survey was published to the learning lab and students were asked to give feedback concerning the efficiency and usefulness of the peer-to-peer tool. We received a total of 42 replies out of a possible 57.

The survey consisted of multiple sections, starting with demographic information such as age, birthplace, and other such identifying markers that can better help correlate the results with demographic trends; the other section collected data about writing skills, personality assessment questions, immersion and flow, usefulness of the peer-to-peer, satisfaction questions, personal opinions on peer-to-peer in general, as well as learning orientation and state of mind during the activity itself.

While these questions that were collected offer insights into the mental states and relationship between an individual's cognitive processes and their benefit/performance in the peer-to-peer platform, for the purposes of this case study we restricted our analysis to the questions directly covering the tool itself, namely, the benefit derived from its use as well as the potential for its implementation in other situations and fields.

DATA ANALYSIS AND RESULTS

The results indicate that a sizeable portion of the class did not lose track of time while completing the required task (36%). This indicates that they could monitor the time and meet the requirement; another interpretation of this result is since the session was done in class with a preset time constraint indicated to the students at the start of the task at hand, the students were forced to be aware of time in order to complete all required parts of the assignment. This is further corroborated by the fact that 50% of the students felt that the time flew by while they are participating in the activity, which signals immersion and engagement in the task at hand. To further the claim of immersion, 41% of students agreed that they could block out the noise and distractions emanating from the class while attempting to complete the task at hand (the classroom was at capacity) and 46% of the class stated that they were absorbed in what they were doing. Several other mirror questions confirmed the information received from these answers

In terms of enjoyment, the results seem to indicate quite robustly the enjoyment of the students in their participation in the activity, with 46% stating that they were absorbed in what they were doing, and the absorption was also met with immersion, as 41% of the class claimed to be immersed in the task at hand, with 31% neutral; this can be explained with the fact that the classroom was at capacity and the ability to block out distraction was limited such that only 40% of the class was able to do so effectively. Sometimes the introduction of interactive tools to a classroom can be counterintuitive if it leads the students to feel that they are not being challenged enough, which could lead to boredom or lack of enjoyment in the task at hand. In the survey, 49% of the respondents disagreed that they were bored while 45% agreed that they had fun while participating in the collaborative learning tool.

In terms of uses and practical applications, the respondents felt that the tool would be adequate for conducting research; however, this might be due to the structure of the exercise itself. 50% also disa-

greed that the tool was effective in the creation and discovery of new ideas, this is understandable since the introductory levels of finance necessitate close adherence to the course material and students are not familiar enough with the content to properly manipulate the information at hand. However, over 50% of the class was of the opinion that the tool helped with problem solving, and 61% felt that it helped them gain course material knowledge and 70% felt the peer-to-peer helped to a little extent in the comprehension of the material.

CONCLUSION

In short, the tool proved to be useful to the students in the classroom setting, with students feeling that the time flew by while they were participating in the exercise. The students also agreed that they enjoyed the tool and had fun doing the task; they were also absorbed and immersed in the activity. The students also felt that the tool helped them improve in terms of problem solving and gaining knowledge of the course material as well as gaining an overall comprehension of the concepts.

The peer-to-peer collaborative learning tool has great potential for use and implementation in the field of finance, and we recommend to practitioners its testing and implementation in the variety of finance courses to ensure its diversity and applicability and, if needed, the modifications required to align the tool with the needs of finance education.

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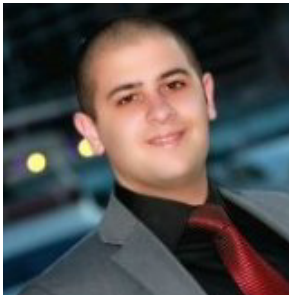
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