Teaching Tip
Simulated Audits to Engage Students in IT Governance and Assurance Courses

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ABSTRACT

IT governance - and its related assurance activities - is important knowledge for information systems students to obtain. This teaching tip describes a six-week simulation involving IT assurance professionals from a major certified public accounting firm (and alumni of Miami University) who lead students in an IT risk and assurance class through a mock IT audit. The lessons we learned as we completed the first semester using this case are discussed. One significant lesson we learned is that students will have varying levels of interest in IT audits and will need to be coached through the significance of the case even if they are not planning to pursue a career in audit.

Keywords: Simulation, Information Assurance and Security, Team Projects, Advisory Boards

1. INTRODUCTION

Information technology (IT) governance and assurance is a corporate function that has been growing in importance for the past decade as the public accounting industry continues to refine and enhance its portfolio of service offerings in response to a dynamic regulatory environment. Ensuring the integrity of information systems has never been more important, and, as a result, certified public accounting (CPA) firms and private internal audit practices have added significant headcount to its ranks of IT auditors (Merhout and Cothran, 2006). For many information systems (IS) students, a career in IT assurance is a challenging and rewarding option. New curriculum guidelines showcase these trends and have suggested IT controls and management frameworks as valuable career-path knowledge in addition to interpersonal, communication and team skills (Topi et al.,

2007). Merhout and Buchman (2007) add that, in an IT audit career, interpersonal skills are equally relevant to the more technical knowledge sets and abilities. In response to these suggestions, educators have added new courses and curriculum content addressing IT governance and assurance, including an undergraduate elective called Information Technology Risk Management, Security & Audit (ITRMSA) at Miami University.

In addition to continuously updating curriculum content to reflect the latest trends in industry, many IS educators have developed close working relationships with firms and businesses that hire their students in order to solicit input into curricula and to provide a source of speakers and other classroom activities. One formal way to engage such stakeholders is via an Advisory Board (Koong, 2003; Sena, Sena, and Crable, 2010). Miami University's IS Advisory Board has members from many industries, including public

accounting. One member of particular interest for this paper is a Risk Assurance director from PricewaterhouseCoopers (PwC), a Big Four CPA firm. Management information systems majors and minors from Miami University are one target group for the recruiting efforts of PwC and its Risk Assurance practice. The PwC director on Miami University's board wanted to engage the faculty to build a stronger relationship and suggested a case study for ITRMSA to be executed by two PwC Risk Assurance associates who were May 2010 graduates and had successfully completed the course in prior years.

The new associates were able to analyze what they were doing in the early months of their careers in IT assurance and compare it to the course to determine the best type of case to most effectively engage the students and supplement the current syllabus and textbook. Moreover these two associates and recent graduates fit the profile of approximately 90% of the students in the class: information systems majors or accounting majors with an information systems minor.

2. CASE DESCRIPTION

PwC developed and provided students with a fictitious case study based on a mock publicly-traded client. Students were responsible for performing tasks representative of those performed by IT auditors in support of a broader integrated audit. Divided into groups of 3-4 people, students were matched with a current PwC Risk Assurance associate who served as their mentor throughout the case.

After an in-class kickoff meeting in which students were trained on fundamental concepts of auditing, each group was responsible for performing substantial work outside of the classroom to ensure the case progressed as needed within the six-week timeframe allotted. Striving to touch on various phases of an audit, the case required students to conduct planning, execution, and completion tasks in collaboration with their PwC mentor via informal e-mail questions and formal weekly conference calls.

One of the planning tasks students were required to complete was a control matrix that allowed students to understand how controls interact to mitigate risk within an organization. The control matrix also required students to tie in course concepts of information processing objectives and application and data security. In addition to the control matrix, students completed the planning task of creating a budget of hours to understand the importance of planning and time tracking in a professional services firm.

Audit execution tasks began with reading control narratives to form an initial understanding, preparing questions for a subsequent interview, and performing walkthroughs with a mock client. In the walkthrough exercise, the two PwC mentors acted in the role of a client contact in the IT organization, meeting with each group and fielding questions about daily IT processes related to user administration and change management. After the meeting, each group of students was debriefed to provide information they may have missed as well as feedback on how they could have conducted the meeting more smoothly, thus providing feedback on their interpersonal communication skills.

Students transitioned into the most challenging portion of the case after beginning to test the controls they learned about in walkthroughs. To provide as real an experience as feasibly possible, PwC created mock client data, including an entire population of IT application program changes and new and terminated system users. Each group selected its own sample, obtained corresponding evidence, and ultimately formed a conclusion on whether each control was operating effectively.

The final phase of the case involved a personal feedback exercise. Students were tasked with reflecting upon their own performance and identifying strengths and areas for improvement. This introspective requirement of the case required students to utilize a writing style to which they may have had exposure in other courses but had not seen a way it translated to the business environment. Final feedback was also utilized as an informal means of evaluation to assess how the case study was viewed by students.

Each element of the case study was designed to provide students an opportunity to apply course curriculum concepts in a medium with tangible application to the work an intern or campus new hire would perform. In addition to this career opportunity benefit, the case allowed students to refine collaboration and interpersonal communication skills due to the close interaction with PwC mentors. The final outcomes for students were manifested in a series of deliverables throughout the case which comprised 12% of their course grade. Feedback was provided to students by both the course professor and the PwC mentors as a means of assessing technical accuracy and level of engagement with the case.

3. DATA

At the completion of the case study, surveys were provided to students in order to obtain quantitative and qualitative data from students' perspectives. This data was meant to serve as a starting point for analysis of the value-add that the case provided to students and to the course's design in general. All 31 students in the class completed the survey and feedback document.

The survey included both closed-ended and open-ended questions about various components of the case. Questions involved students' views of each phase of the case, students' views of the value of having a PwC mentor, as well as overall views of the case. See Appendix I for details of quantitative/closed-ended survey responses. See Appendix II for a few selected comments that provide evidence that the students perceived the case exercises to be beneficial to their learning and development. For example, a mean of 3.9 on a scale of 1 to 5 on the question about overall value of this case was more than satisfactory for our purposes, especially given that we knew some students were not highly interested in IT auditing as a career.

In addition, several noteworthy observations about the student comments will be discussed in detail in the lessons learned section. This is a key part of continuous improvement of this type of case simulation: one must both solicit feedback and act upon it. Both the instructor and the two PwC associates leading the case critically reviewed the data and subsequently discussed opportunities for improvement while the details of the case were still fresh in our minds.

4. LESSONS LEARNED

After receiving survey responses from students and analyzing the data, we noted a number of areas for improvement in case design. Given the potential for executing the case again, these enhancements were meant to ensure gaps were addressed and students were left with an understanding of the various views of an audit. While IT audit may not be the career path for many of the students, it is important to provide them with an experience that will allow them to better understand the work being done when interacting with auditors in the role of auditee, something many business professionals might encounter in their careers.

One area to keep in mind with doing this case study is that the students are just that - students. They are not full time IT auditors and have other homework, projects, and extracurricular activities they are a part of, in addition to jobs they may also have. While the work should not be purely at the convenience of the students, they were much more receptive to the case when there was flexibility with the work and the meetings. Although there are some client commitments that IT auditors must make sure they attend, there is a large emphasis on work-life flexibility that can be portrayed in this case as well, as long as the work is still being completed timely and effectively.

In addition to being flexible, it was noted that the students preferred it when both the client and PwC mentor were concise. They preferred a high level overview at the beginning so that they understood the scope of the work that would be done, and then they gained more value from the weekly mentoring meetings when it went into more detail about the specific work being done at that point in the case. Similarly, the initial kick off meeting is being restructured as a result of this because it provided too much detail to the students. The students were overwhelmed before they even began the case, and they realized as they went through the case that they were more than capable of handling the case on top of their other commitments. By restructuring the case and being more cognizant of communicating clearly and not providing too much extra detail with instructions and mentoring, the students are likely to have a more meaningful learning experience.

Another interesting aspect of this case is that the students valued the real life experience and wanted to be challenged even more. It provided students an opportunity to exercise critical thinking in a real-world environment as opposed to from a textbook. Students built a variety of skills in this case: professionalism, team work, written communication, verbal communication, time management, IT knowledge, and audit understanding. It was evident in the mock client meetings that the students wanted to take the case a step further and provide recommendations to the client about ways to improve the company's processes. This is a skill not often seen in newer employees, as it is often the responsibility of more experienced employees to make recommendations to the client. By providing students with the experience to take ownership of their work and lead the audit, they were challenged to come up with solutions and add value to the client instead of leaving that to more experienced members of their team.

Similar to the environment at PwC and other professional settings, students were provided with mentors during the case. Each team was assigned a mentor to work with throughout the case, but both PwC associates worked with all of the teams in some capacity. Students were clear that they appreciated the "mentor" style of teaching, as opposed to being told they were incorrect or losing points on the assignment. Additionally, students recognized that both employees had different mentoring styles that complemented each other. Each student and team learned differently, and it was beneficial to the mentor to learn the style that best fit each student. The students turned in higher quality work when only being told what the items to turn in were rather than just how to complete each item that was due. Students also made it known that they valued the communication and timely responses from their mentors; it demonstrated that the mentors respected their time and were doing what they could to help the students be successful. Although IT auditing was not an area in which the students had much experience, they were enthusiastic about the experience and gained more knowledge about the case because they were comfortable going to their mentors throughout the case.

5. DISCUSSION AND CONCLUSION

One key characteristic for success in a simulation such as described in this note is trust. The instructor obviously has to trust the alumni professionals coming into (and to some degree, taking over) his or her classroom. Moreover, the professionals must trust that the instructor will give them enough freedom to be able to plan, develop, and execute the case without overwhelming scrutiny and supervision. The professionals, after all, know the details of their day-to-day responsibilities and activities, which is why the case is so valuable to the class: it brings a level of reality that no degree of class readings and discussions could ever approach. The first author and instructor in this class is a former auditor, but only has a very brief amount of IT risk and audit experience, and the professionals bring a wealth of additional knowledge.

Another level of trust that must exist is that the students in the class must respect the credentials of the professionals and trust that the case is realistic. In order to engender this level of trust of the professionals by the students and by the instructor, the participating professionals must be carefully selected. In this case, both professionals are recent graduates of the university and completed the class in the past couple of years. Indeed both professionals performed extremely well in the class and greatly impressed the instructor with their intelligence, diligence, attitude and professionalism. Thus it was an easy decision to make when PwC offered to create such a case and to provide these two professionals as the case leaders.

Based on the success of this case as viewed by the instructor in helping to achieve overall course learning objectives, by the professionals who developed and coached the case, and by the students as evidenced by their survey responses and comments, we have decided to continue this simulation indefinitely in the future. Of course, each year will bring a new set of students and thus a different dynamic. However, as long as the instructor and professionals continue to objectively scrutinize and evaluate the case and make

necessary changes, we are confident that this will be an excellent learning opportunity that will excite the students to the point that they will tell their IS major and minor friends about the class. Given that the class is an elective and that we are always recruiting for more majors and minors, such positive word-of-mouth publicity is always welcome.

6. REFERENCES

Koong, Kai S. (2003), "Teaching Tip: Forming an Effective Information Systems Advisory Board," Journal of Information Systems Education, Vol. 14, No. 2, Summer 2003, pp. 133-136.

Merhout, Jeffrey W. and Buchman, Sarah E. (2007), "Requisite Skills and Knowledge for Entry-level IT Auditors," Journal of Information Systems Education, Vol. 18, No. 4, Winter 2007, pp. 469-478.

Merhout, Jeffrey W. and Cothran, Pauline E. (2006), "Increasing Demand for IT Auditing Creates New Career Options for AIS/MIS/IT Students," Review of Business Information Systems, Vol. 10, No. 4, pp. 41-49.

Sena, Mark P., Sena, James A., and Crable, Elaine A. (2010). "Faculty Perceptions on the Goals and Achievements of Information Systems Executive Advisory Boards," Information Systems Education Journal, Vol. 8 (41), pp. 3-15.

Topi, H., Valacich, J.S., Kaiser, K.M., Nunamaker, Jr. J.F., Sipior, J.C., de Vreede, G.J. and Wright, R.T. (2007), "Revising the IS Model Curriculum: Rethinking the Approach and the Process," Communications of the Association for Information Systems (Volume 20, 2007), pp. 728-740.

AUTHOR BIOGRAPHIES

Jeffrey W. Merhout is an Associate Professor of MIS at Miami University in Oxford, Ohio. He holds a Ph.D. and MBA from Virginia Commonwealth University and is a Certified Public Accountant (inactive). He has two years auditing experience in public accounting and another year as an operational internal auditor. He has information systems consulting experience in several industries, including financial services, manufacturing and retail. His current research interests focus on: qualitative methodological issues, particularly in positivist case studies; sustainability issues with information technology and sustainability solutions offered by information systems; and information risk management, IT security and information systems auditing. He has presented and published his research at numerous MIS conferences and in journals, including the *Communications of the ACM, Communications of the AIS*, *Journal of Information Systems Education*, *Journal of Computer Information Systems*, *International Journal of Accounting Information Systems*, *Review of Business Information Systems,* and *Information Systems Control Journal*.

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APPENDIX 1: Quantitative Feedback

PwC Feedback - Risk Assurance Case Study 2011

BiCorp Case	
*Rate the following from 1-5 by **bolding** your selection (1=Not useful, 5=Extremely helpful/valuable)*	
Phase I (Kickoff)	3.39
Phase II (Roles & Responsibilities, Control Matrix, Budget to Actual)	3.29
Phase III (Walkthroughs, Request Lists)	4.42
Phase IV (Testing)	4.65
Phase V (PFFs, Final Budget to Actual)	3.52
Coaching & Development	
*Rate the following from 1-5 by **bolding** your selection (1=Not at all, 5=Significant amount)*	
Professional Skills Developed	
Communication	4.26
Business writing skills	3.48
Time management	3.84
Teamwork	4.39
Understanding of an audit	4.35
PwC Coach Communication:	
Effectiveness & value of weekly touchbases	4.39
Number of times on campus	3.42
Overall effectiveness & value of having a coach	4.61
Most Effective Means of Communication	E-mail (15), Call (8), Mtg (8)
General Comments	
*Rate the following from 1-5 by **bolding** your selection*	
Overall amount of time allocated to complete case (1=Too little, 5=Too much)	3.32
Overall value derived from completing case (1=Minimal, 5=Significant)	3.90

APPENDIX 2: Anecdotal Feedback

"This case was very unique in that it was part of a college course. I very much enjoyed getting to do a case in this manner. It is rare to get work that is not conceptual in nature for class work. The case was very real to life and I found it rewarding."

"Gave an accurate taste of 'real-world' processes and work in the modern business environment. Gave students realistic responsibilities to let us see what to expect in a related field of work."
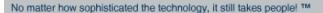
"The case really showed and gave us a real world application to some of the information we have been learning in class. It also showed us what kinds of work people in the field of assurance actually do on a day to day basis."

"The case taught me a ton about the audit process, as well as professionalism."

"The case was really valuable in that it tested all sorts of thought processes on the part of students, and shows that the business world values all kinds of experiences, points of view, and thinking methods when dealing with case studies."

"Hi, Work is going great. I'm heading over to [*redacted client name*] this afternoon to have as a potential client. I would love to come back and speak to classes. There was a lot of information I learned in class that is pretty useful here. Also, the mock audit we did was extremely helpful, I'm so glad we had to opportunity to do that. Let me know if there is anything I can do to help!" *-May 2011 Graduate in recent LinkedIn communication with course professor*

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