What spreadsheet and database skills do business students need?

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ABSTRACT

The Principles of Information Systems course taught at a medium-sized Midwest University consists of Information Systems conceptual material plus Microsoft Excel and Access skills that the Information Systems faculty feel are most important to business students from all business disciplines. These skills range from using basic mathematic functions and formulas to complex "what-if" statements for Microsoft Excel spreadsheets. Microsoft Access topics range from constructing simple tables, queries, forms, and reports to complex calculations using Expression Builder. However, aside from a few comments from faculty teaching in accounting, economics, management, finance, or marketing, it is not known specifically what specific skills that faculty from other major universities consider important for successful completion of their programs.

A survey consisting of 18 spreadsheet and database case attributes was sent to graduating seniors, business faculty and to area businesses requesting that they rate each case as to its importance in their specific major, business curriculum or knowledge skill set respectively. Each participant was asked to select the appropriate block on a Likert scale ranging from "not very important" to "very important" for each of all 18 cases. The responses were returned by 18 students, 22 faculty, and 81 area businesses. While there was nothing that indicated that the Information Systems faculty were not teaching important skills there were some interesting facts noted. Considering this, the faculty has decided to broaden the scope within each case to ensure fluency in Excel and Access by employing a fewer number of cases and more emphasis on specific skills.

Keywords: Spreadsheet skills, database skills, CIS programs, MIS programs, Spreadsheet skillsets
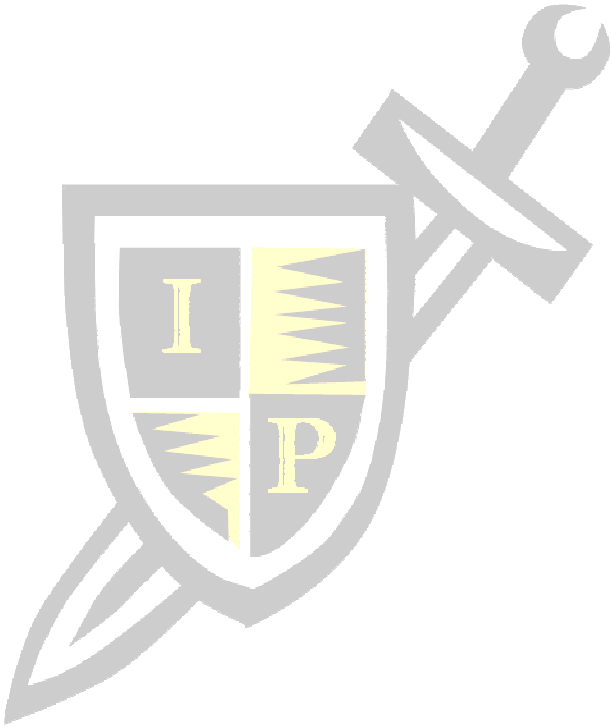
INTRODUCTION

There is disparity between teaching subject material based on academia and teaching what industry says is needed (Tickle, Kyng & Wood, 2014). In a business environment, one would consider that complex spreadsheet and database algorithms might be needed to fuel today's dynamic business ventures. Additionally, one might further stipulate that depth into a few skills might be better than breadth into many skills in these business cases. Frownfelter-Lohrke, 2017 suggests that not understanding spreadsheet analysis and not being able to create good spreadsheets causes losses for their respective businesses. But it would not be prudent to even believe that less, could be more, with respect to fluency in data driven problems. After all, faculty need to use, as well as be comfortable with technology to improve student learning (McKnight, O'Malley, Ruzic, Horsley, & Franey, 2016).

Computer Information Systems programs, as early as 2004, focused on the skills of spreadsheet and database as earning a passing grade without much understanding of the application of the attained skills. These mechanical skills, argue Baugh & Morris (2004), should be included in CIS programs but also the components of the CIS major (e.g. servers, networking, and security) so that the students master the concepts and not just the software. While these concepts skills are good for majors, should these skills be provided in lieu of the basic understanding of what, why, and how the spreadsheet and database skills are used? Do students understand the "why" of completing a mathmatical function or just how to negotiate the steps (Patton, Renn, & Guido, 2016)?

The disparity appears to be on deciding which skills to teach business students. Many faculty members are academics or have been out of the "field" for many years but they are comfortable with the skills that they know. Other faculty members have just joined academia and are bringing in skills that they learned in their respective post secondary education programs. Still, other adjunct faculty members might be working in the industry and know the applicability of these skills, but unable to enact change based on their adjunct status (Ridge & Ritt, 2017). Harris, 2017 states that "the perception of adjunct faculty as valued team members contradicts academia's lack of investment in supportive programs and educational opportunities for adjunct faculty" (p. 1).

FINDINGS

Table 1 (Appendix) depicts both the positive and negative ratings that students, faculty, and area businesses provided on their completed survey. It should be noted that for the discussion in this paper the mode rating score was used for comparison purposes between student, faculty and businesses. The faculty that are teaching the Excel and Access skills were excluded from this survey; only the other faculty in the business college were included. It was important to note that only the first Excel case, the most basic, was the only case to be rated "Extremely Important" by all three entities; students, faculty, and businesses. Similar to this anomaly was Excel Case 10 where all three entities indicated this skill set as "Not Important." The other ten cases received a rating differently by all entities except for Cases 3 and 4 being rated "Very Important."

Like Table 1, Table 2 (Appendix) depicts the students, faculty, and area business rating that were provided on the survey. Only Case 3, creating calculated fields and advanced queries were thought to not be important by all three entities; students, faculty, and area businesses.

While this will be addressed in the discussion below, it is important to note that most smaller businesses do not use Access so many may have just guessed at what attributes they placed importance on. All of the other 5 cases had differing results with respect to the three entities grading the attributes.

DISCUSSION

Many times, faculty ponder the subject areas that they are teaching for importance to the businesses that they are preparing students for. Unless faculty spend a lot of time in the field, it would be unlikely that they would know exactly what industry requires (Garrett, Saloner, Nohria, & Hubbard, 2016). The purpose of this activity was to take the Excel and Access attributes that are being taught to 300+ students per semester and discovering if the students, the student's subsequent professors, and then the businesses, wanted these attributes taught. For instance, if an Economics professor introduces a Gross National Product chart to their students then one would posit that their students would need to know something about charting and how to both create and manipulate. Likewise, the students and the businesses were queried to rate the importance of these same Access and Excel attributes. There are similar examples for finance, marketing, management, and even accounting. However, the faculty only gave a "Very Important" rating to charting, as did the students and businesses. On the other hand, some of the advanced Excel skills like using XML data and Power Queries might not command the respect that more basic skills do. Students need analytical skills as they are pervasive in today's business (Formby, Medlin, & Ellington, 2017).

Microsoft Excel

Other areas that didn't seem to make sense was the last Excel case, the ability to create and edit macros and customize functions. The function of a macro is to simply record keystrokes and then play them back automatically with a couple of keystrokes like "Control Z," that might be used to enter a complex formula that is used multiple times. While faculty and students rated this as Very Important, area businesses did not even think it important. This could be misinterpreted as not knowing what a macro is, one was tired of looking at the survey, or that macro was the last case and could be assumed to be "tough."

One other Excel anomaly that was noted was that students rated the Hyperlinks and 3D functions as "Extremely Important" while faculty and businesses did not think this was important at all. This was troubling because hyperlinks are the essence of getting from one place to the next within a webpage as well as many online documents. This is the point and click that takes the user from one place to another while online. The 3D functions; however, allow one to work with multiple spreadsheets and workbooks with mathematical functions. An example would be to have an annual summary sheet with multiple salespeople's financial data being aggregated and sent to this annual sheet. One would think that businesses would use this feature often as they tend not to use a database.

Microsoft Access

Microsoft Access, like many databases are identified as *Relational Databases*. The relations that the user must establish are identical or nearly identical fields between two tables. It

seems necessary therefore, that students, faculty, and businesses would rate this usage as Extremely Important or Very Important, and that was just the case. What was unusual though was businesses rated this case as Very Important but chose to rate nothing else as Extremely or Very Important. One might speculate that their belief of the establishing relationships was an oversight when they rated it as very important or that it was just an anomaly. Nonetheless, businesses, for whatever reason did not care much for the database. Could this be that they have not had personnel that possess database skills?

Faculty, on the other hand chose a Likert value for all the other cases as Very Important or Extremely Important for five cases, leaving the only case where the creation of calculated fields and advanced queries to earn a value of Not Important. It has been noted by many faculty teaching in an Information Systems program that database is too difficult and that businesses really do not care much about databases and while the results indicate this, so do the student's assessment of the six Access cases. The students were split with three cases earning a value of Very Important and three cases being Not Important. It should be noted that as a group, none of the students indicated any of the Access cases as Extremely Important. What is ironic though, is that students tend to score ten to fifteen points higher in Access lab grades than they do for Excel lab grades.

CONCLUSION AND FURTHER STUDY NEEDED

Faculty tend to teach what they deem important and in doing so may not hit the skill attribute target that businesses expect. Is Microsoft Access not being used in businesses because Access is related to critical thinking? Are critical thinking skills being taught? Faculty, while they believe in critical thinking, may not be very effective at teaching these valuable skills (Huber & Kuncel, 2016). Academic grades may allow a student to graduate but she or he cannot do much with that grade once they begin earning a paycheck if they do not hold the skillsets that businesses require. It would, therefore; make sense that faculty would teach what businesses need, even if the faculty member does not want to teach this, or if the faculty member thinks, based on his or her past, that something else should be taught.

While the focus of this paper is on spreadsheet and database skills, one must wonder if this is the discussion that should be taking place. Or should the focus be on "why" spreadsheet and database functions are used? Should students study the applicability of the function? And finally, should business process modelling be employed (Mandal & Sarkar, 2016).

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APPENDIX

Table 1 – Spreadsheet Attributes Scores

		Extremely/Very/Not Important		
Case	Basic Attributes	Students	Faculty	Businesses
1	Creating formulas	E	E	E
	Copy/Move data			
2	Relative/Absolute	E	V	E
	Creating functions			
3	Creating charts	V	V	V
	Edit charts			
4	Create tables	V	V	V
	Conditional formatting			
5	Pivot tables	V	E	N
	Slicer and filter			
6	One/Two-Way data tables	V	N	N
	Goal Seek/Solver			
7	Nested logic functions	V	E	N
	Advanced lookup function			
8	Math/Statistical function	V	E	N
	Forecasting			
9	Hyperlinks/3D formulas	E	N	N
	Multiple Workbooks			
10	Using XML data	N	N	N
	Power Query			
11	Formatting Workbooks	V	N	N
	Customization			
12	Create/Edit Macros	V	V	N
	Custom Functions			

Table 2 – Database Attributes Scores

Case	Basic Attributes	Extremely/Very/Not Important		
		Students	Faculty	Businesses
1	Database creation	V	V	N
	Add/Delete records			
2	Establish relationships	V	E	V
	Create queries			
3	Create calculated fields	N	N	N
	Advanced queries			
4	Use form tools	N	V	N
	Create and modify reports			
5	Format data entry	V	V	N
	Create lookup fields			
6	Advanced queries	N	V	N
	Modifying queries			