POSITIONING COMPUTER LITERACY AS A VALUE-ADDED BUSINESS CORE COURSE

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ABSTRACT

Many business students are introduced to information systems via computer literacy coursework and/or assessment tests. Such an introduction can be less than ideal, particularly in a field that suffers from declining enrollment. Introductory computing often is software skills-specific and tutorial-intensive and thus may not offer an engaging view of the field or capture the larger relevance of information technology. In addition, the mere existence of an assessment or "test-out" option can further trivialize the perceived value of the course. This research develops a solid foundation for advancing beyond a focus on computer literacy and software skills to tap the value-added potential of an introductory computing course. The proposed approach ultimately frames the course content around the documentation and presentation of a business plan. A business plan provides an integrative vehicle for teaching information concepts and software applications in the larger context of business analysis and communications. The importance of the framework goes beyond the teaching of skills – it provides for a broadly relevant and engaging approach that promotes a higher level of learning. The direction and implications of the approach are discussed.

JEL: I29, M15

KEYWORDS: Introductory Computing, Computer Literacy, Business Plan, Pedagogical Framework, Business Core

INTRODUCTION

The function and value of an introductory computer literacy course has been debated and analyzed for nearly two decades (e.g., Harris 1993; Gordon and Chimi 1998; Dyer et al. 2004; Wallace and Clariana 2005; Hulick and Valentine 2008; Shannon 2008; Grant et al. 2009; Rondeau and Li 2009; Morris 2010). Along the way, the "IS 2002" curriculum guidelines relegated the "Personal Productivity with IS Technology" course to a discretionary prerequisite status with the use of self-study modules (Davis et al. 2001; Gorgone et al. 2003); and "IS 2010" removed it from its guidelines (Topi et al. 2010). However, not only does research continue to show the need for a personal productivity course (e.g., Grant et al. 2009; Rondeau and Li 2009; Morris 2010), but tutorial-based modules can serve to trivialize the course by considering it primarily with respect to software mastery rather than the use and usefulness of the tools. This paper develops a foundation for viewing the value-added potential of an introductory computing course as more than just limited to computer literacy or software skills proficiency. By advancing beyond content and focusing on context, an introductory computing course can be positioned as a value-added core course for all students and majors regardless of prior levels of computer skills. While value-added positioning can be realized via various contexts, a computer literacy course is particularly fitting to business analysis and communications.

The direction and implications of this type of context are discussed with respect to a framework and coursework centered on the development of a business plan pertaining to the students' entrepreneurial ideas. Not only does the framework provide for a higher level of learning, but it also can help to personalize interest in the course and in the relevance of technology, which is especially important to a field of study that has experienced declining enrollment (Walstrom et al. 2008). In developing the framework, the paper will proceed with a literature review of research on computer literacy and student

proficiency, followed by a methodology that analyzes the computer literacy course with respect to its content and context, and then a discussion of the resulting framework and conclusions.

LITERATURE REVIEW

Studies (e.g., McDonald 2004; Wallace and Clariana 2005; Hardy et al. 2006; Hulick and Valentine 2008; Shannon 2008; Grant et al. 2009; Rondeau and Li 2009; Morris 2010) of incoming college freshmen continue to show that – despite contrary assumptions – a majority of students have not mastered Microsoft office applications. Perhaps surprisingly, a lack of mastery goes beyond the more complex tools of Excel and Access to include PowerPoint as well as Word. Consistent with these findings, studies show that computer literacy courses add value, with post-course assessments revealing increased literacy (Case et. al 2004; Wallace and Clariana 2005; Shannon 2008) as well as confidence (Smith 2004). The value extends even to the most basic of applications as one survey of students (Dunsworth et al. 2004) rated Word and PowerPoint as the most useful of the content covered, a finding consistent with one faculty survey (Hardy et al. 2006) that ranked them as most important for college students as a whole.

Studies that support the need for a computer literacy course seem to be at odds with other studies and observations acknowledging "increased skill and comfort with computers" (Lee 2002, p.30). In fact, given the changing technological landscape surrounding the increase in computer usage, various curricular and pedagogical changes have been made with respect to teaching computer literacy (Dickerson 2007), including the use of self-study modules (Gorgone et al. 2003) as well as the elimination of the required introductory computing course (Topi et al. 2010). Even for college curricula that continue to require a computer literacy course, proficiency tests are being used to determine the need for taking the course (Cardell and Nickle 2003).

The debate surrounding computer literacy can be explained in part by a gap between computer usage and mastery. While student self-confidence may increase in correlation to the number of computing courses taken in high school (Case et al. 2004; Morris 2010), this self efficacy may not translate to actual achieved literacy (Larres et al 2003; Case et al. 2004; Grant et al. 2009). In addition, even though self efficacy may increase upon taking a freshman-level computer literacy course (Smith 2004; Bartholomew 2004; Morris 2010), students' confidence and skills – and employer confidence in them – are diminished by graduation, quite possibly due to the lack of reinforcement of the skills in the more applied context of other courses (Bartholomew 2004; Johnson et al. 2006). One explanation for the gap between computer use and mastery stems from a matter of content versus context. More specifically, it has been argued (Dyer et al. 2004) that whereas high school computing courses tend to focus on keystrokes, college-level computing courses tend to place the software skills in the context of computer concepts, thus increasing the educational value of the content. However, computer literacy is not limited just to the context of the "computer." For example, as noted in one study (Grant et al. 2008, p. 155),

> ...spreadsheet applications can perform many powerful tasks that require users to not only be familiar with the tool but also be familiar with some basic business, mathematical, and financial problems.

DATA AND METHODOLOGY

Taking computer literacy to a higher level beyond just the context of computer concepts requires an evaluation of the types and functions of office software in order to reveal the application-oriented contexts that can be pursued in an introductory computing course. As such, the development of a framework will proceed with an analysis of the course tools (i.e., the office applications), the course content (including skills, topics, and deliverables), and the course context (based on its dimensions, particularly with respect to information literacy).

The most widely used office application software provides for three types of functions: communicating information, analyzing information, and managing information (see Table 1). While each piece of software can serve multiple purposes, Word and PowerPoint are focused primarily on written and presentational communications, Excel on data analysis, and Access on organizing and managing data. In addition to its number-crunching abilities, Excel also can be readily used for presenting and communicating information in the form of tables and charts, and for processing information in the form of formula and macro-driven spreadsheets.

Table 1: Software vs. Function

Function / *S/W*	Communicate Information	Analyze Information	Manage Information
Word	✓		
PowerPoint	✓		
Excel	✓	✓	✓
Access		✓	✓

This table notes the functional focus (i.e., communicating, analyzing, and managing information) of the four most common office application software packages (i.e., Word, PowerPoint, Excel, and Access).

With functionality ranging from communications to information management, an introductory computing course could be compatible (at least in part) to the context of a communications course, a business course, or an information systems (IS) course. These contexts can be considered along a continuum, with courses in business communications serving to blend communications skills into a business context, and courses such as systems analysis (as just one example) that blend together business and information systems concepts. In addition, this continuum of courses can serve a range of target student audiences from non-business majors to IS majors. Table 2 considers the continuum of course contexts relative to the primary target audience that would be served.

Table 2: Introductory Computing Context and Target Audience

Context:	Communications Skills	Business Communications	Business Analysis	Systems Analysis	Information Systems
Target Audience:	*University-Wide*	*Non-business and Business Students*	*Business Core*	*Business and IS Majors*	*IS Majors*

This table notes the target student audience that would be relevant to each of the potential contexts of an introductory computing course. On one end, with a potential focus on communication skills, an introductory computing course could have university-wide relevance to nearly all students and majors. On the other end, with a potential focus more purely on information systems, an introductory computing course could be most relevant to IS (or other technology-related) majors.

Dependent upon the context and the audience, an introductory computing course can focus on different combinations of software applications for different purposes (see Table 3). The skills-based tasks tend towards computer literacy course content, while the systems-oriented tasks tend towards management information systems (MIS) course content. Although certain software is more compatible to certain contexts, each application can serve multiple purposes; so the grouping together of a set of software skills or tasks within or across contexts would benefit from an integrative framework. The importance of this type of framework was emphasized in a redesign of the core MIS course that organized the content around a semester-long series of integrated assignments, in this case pertaining to web and database prototyping (Grenci 2005). Likewise, a redesign of the introductory computing course can provide a complement to an MIS course by focusing on a business analysis and communications approach to computer literacy.

Table 3: A Closer Look: Content vs. Context

Context S/W	Business Communications	Business Analysis	Systems Analysis	Information Systems
Word	*Memos, Reports*	*Diagrams, Deliverables*		
PowerPoint	*Presentations*	*Executive Summaries*		
Excel	*Tables, Charts*	*Number Crunching*	*Prototyping*	*Decision Support*
Access		*Queries*	*Data Structures*	*Database Systems*
	Computer Literacy Course Content		***MIS Course Content***	

This table considers four contexts of an introductory computing class (e.g., Business Communications), and provides examples of the types of content or deliverables (e.g., Tables and Charts) that would be relevant to each context. The content and deliverables also are organized with respect to the relevant office application software (e.g., Excel).

While some academicians (e.g., Hershey 2003; Grenci 2005) have proposed approaches that move away from a more purely IS-focused course in the business core, others (e.g., Salisbury et al. 2004) reject such a move and tout the benefits of maintaining an IS perspective. Although these arguments have been made in reference to the MIS course, the same debate could apply to the introductory computing course (see Table 4 for the difference between these two courses as per the IS 2002 recommendations). Furthermore, it has been noted that "some business school academicians and administrators …do not see a need for a separate Introduction to IS course" (Salisbury et al. 2004, p. 129). However, the choice of context can differentiate and position an introductory course to serve as a value-added prerequisite or complement to an MIS course. Ultimately, an argument can be made for a compromise to introductory computing that provides for an IS-related foundation while maintaining differentiation from the MIS course.

Table 4: Introductory Computing vs. MIS (Gorgone et al. 2003)

IS 2002.P0 – Personal Productivity with IS Technology

This prerequisite course enables students to improve their skills as knowledge workers. The emphasis is on personal productivity concepts using functions and features in computer software such as spreadsheets, databases, presentation graphics, and Web authoring. Although identified as a course, this material can be delivered as self-study modules, as modules associated with other courses using the software, or as a full course.

IS 2002.1 – Fundamentals of Information Systems (*Prerequisite: IS 2002.P0*)

This course provides an introduction to systems and development concepts, information technology, and application software. It explains how information is used in organizations and how IT enables improvement in quality, timeliness, and competitive advantage.

This table compares the content/focus of two IS-related classes that are commonly taught in business curricula. "Personal Productivity" describes an introductory computing or computer proficiency type of course; and "Fundamentals of Information Systems" describes a principles or introduction to MIS type of course.

Whereas the MIS course refers to systems concepts and is concerned with how information is managed in an organization, the introductory computing course refers to personal productivity concepts and is concerned with the software skills of knowledge workers. Given this difference and in order to delineate the courses, it can be argued that database concepts and applications (including Microsoft Access) should be covered in the MIS course rather than in introductory computing. At a broader level, while many (e.g., Dyer et al. 2004) may view the context of computer concepts (see Table 5) as a value-added framework for teaching computer literacy, that context (as a whole) also may be a better fit with the MIS course. The same argument applies to introductory computing courses that are focused on other systems-oriented concepts such as the Internet (Hoffman and Blake 2003) or security (Werner 2005) – again, a systems focus may not be the best fit with the typical software applications covered in introductory computing. Ultimately, the challenge is to frame computer literacy and software skills within a larger context while maintaining a value-added positioning and differentiation relative to the MIS course.

Table 5: Example of Computer-Focused Concepts Covered in Introductory Computing (Dyer et al. 2004)

• **Computer hardware (input, output, storage, and processing devices)**
• Computer software (application software, system software, user interfaces, etc.)
• Networking technologies (LAN vs. WAN, communication protocols, wireless, etc.)
• Data and databases (DBMSs, relational databases, queries, primary keys, etc.)
• Internet concepts (URLs, search engines, e-commerce, Internet services, etc.)
• Computer security (cryptography, piracy, data privacy, cybercrime, viruses, etc.)
• System development (development processes, programming languages, etc.)

This table lists example topics that might be taught in a computer concept focused introductory computing course. Note: introductory computing classes are not necessarily computer concept focused – some for example, have more of a business application focus.

As an alternative to a computer-concept intensive course, the relevance of IS can be maintained in introductory computing by focusing on information concepts, the significance of which is emphasized at a definitional level in this encyclopedic abstract (Blackwell 1997b):

> *Processing, delivering, and communicating information are essential objectives of the management information system of an organization. The system employs information and communications technology in achieving these objectives. The concept of information is therefore fundamental to the design of an information system.*

Consistent with this emphasis, information problem-solving was put forth (by Eisenberg and Johnson 2002) as a basis for teaching computer skills in context. Characterized in terms of "information literacy," information problem-solving begins with task definition and then proceeds to the seeking, use, synthesis, and evaluation of information. The goal is to advance beyond a "laundry list of isolated skills" towards an integrated approach where students:

> *...should be able to recognize what they need to accomplish, determine whether a computer will help them to do so, and then use the computer as part of the process of accomplishing their task (Eisenberg and Johnson 2002, p. 3).*

Information literacy also was considered in a curricular effort (Johnson et al. 2006) to integrate computer skills throughout the business core so as to ensure the computer literacy of graduates.In addition to its fit with information problem-solving, a computer literacy course is inherently relevant to the business analysis and communications context previously discussed. The underlying basis of a computer literacy course is concerned with "knowledge work" (Gorgone et al. 2003) and thus – by definition – with the "processing of information in order to solve problems" (Blackwell 1997a). In turn, knowledge work is at the crux of consulting, which relies on information technology, analytical thinking, and communications (Nord 1996; Fincham 2006). Ultimately, all of these dimensions (i.e., analysis and communications, information concepts, and computer literacy) can be integrated and framed in introductory computing by organizing the course content and assignments around the development, documentation and presentation of a business plan, a vehicle that serves both business analysis and communications purposes (see Figure 1).Business plans have been employed as pedagogical vehicles in various courses and disciplines.

Perhaps not surprisingly, a business plan provides a commonly-used focal point for teaching entrepreneurial concepts (Fregetto 2005; Solomon 2007); and it can be used effectively for courses in finance (Goetz, Tombs, and Hampton 2005), accounting (Hand 1998; Tschopp 2004; Nickolai 2006), and economics (DeBoer 1998). In addition to entrepreneurial and financial applications, the cross-functional nature of a business plan makes it a useful tool for an introductory business course (Mattei and Hall 2006; Basile and Knopik 2011) as well as a capstone strategy course (Schinski, Malik, and Morse 2000). Perhaps most important to this discussion, a business plan – while useful for covering business concepts –

is meant to convey information; and as such, it can be used in a communications context (Mahin 2004; Nicosia 2005) and to provide a reference point for teaching information concepts.

Figure 1: Dimensions of Introductory Computing as a Value-Added Core Course
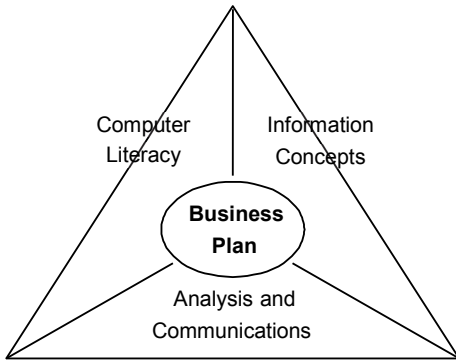
This figure identifies the Business Plan as having dimensions related to Computer Literacy, Information Concepts, and Analysis and Communications. As such, the Business Plan can provide a framework for teaching an introductory computing class.

RESULTS

The development and communication of a business plan can provide a reference point for teaching concepts relevant to organizing, analyzing, summarizing, and presenting information with the assistance of computer software applications. All of these elements can be combined in an introductory computing course by having students propose, research, construct, and present a business plan (or parts thereof) related to an entrepreneurial activity of their choosing. As a semester-long series of assignments, the approach would provide for an interesting context to engage and inform the students. At the same time, it would provide an integrative context for introducing and discussing various business functions and disciplines, thus reinforcing its value as a core course.

The elements of a business plan can provide the basis for several application-oriented exercises (see the Appendix for an outline of a typical structure of a business plan). As numerous studies have put forth detailed descriptions of business plan exercises and deliverables (see Nickolai 2006 for a comprehensive example with pedagogical methods), such details will not be presented here. While business plans take on many forms, they consistently include a section on the business description and a section on financial analyses. Within these sections, an integrated set of exercises (see Table 6 for examples) can be constructed to employ features and functions of the office applications that are customarily covered in a computer literacy course. It is important to note that despite its roots in business curricula, the business plan context can be applied within any discipline. No matter the entrepreneurial interests, students can take on the roles of inventor or philanthropist or business owner, each making use of the same framework. In essence, a business plan can inform any entrepreneurial activity, including those related to the "diverse world of social enterprise" (see Thompson and Doherty 2006 for profiles of social enterprise).

In fact, one of the primary goals of a business plan – to obtain financing – also is a "major challenge facing social entrepreneurship" (Tyson 2004, p. 32). That relevance extends to the business plan elements outlined in Table 6. For example, a break-even analysis can look at donations and donors (instead of sales and customers); and a pro-forma is not limited to Income Statements – it also can be applied to a Statement of Revenue and Expense, which is commonly reported for non-profit organizations. Such variations do not change the content or goals of the course as the focus remains not on the specific context nor on teaching the nuances or details of financial analysis, but rather on the application of software tools as framed by the general context.

Table 6: Example Business Plan Elements

Section	Element/Task	Functional Area	Software
Business Description	- Mission Statement - Organization Chart - Operating Procedures (Process Diagram) - Marketing Plan - Competitor Analysis	Marketing and Management	Word

Financial Analysis	- Break Even Analysis
	- Start-up Budgets
	  Sales
	  Purchasing
	  Operations
	- Pro Forma Statements
	  Cash Flow
	  Income
		Finance and Accounting	Excel

Presentation and Summary	- Product/Service Presentation - Final Presentation - Executive Summary - Web Synopsis		PowerPoint (and Word)

This table lists examples of typical business plan elements categorized into two major sections – business description and financial analysis. The business plan elements also are categorized with respect to the relevant functional area as well as the office application software that would be primarily used to produce the element.

A business plan starts with a description of the business that can include a mission statement, marketing analysis, operating procedures, and an overview of the personnel. There are various informational dimensions relevant to this description, ranging from audience analysis; summarization; use of outlines and appropriate organization; and use of charts (such as an organization chart or a process decomposition diagram, the latter of which can summarize operating procedures). In addition, other elements that are not traditionally found in a business plan can be created in conjunction with the description. In particular, a marketing brochure (which provides for lessons pertaining to information summarization and layout) can be used to describe the business, service, or products. All of these elements can be pieced together into a Word document, providing an integrated perspective to the information that can make use of document sections, headers and footers, hyperlinks, and embedded objects.

Financial analyses – including break-even, budgetary, and pro-forma projections – also are a major part of a business plan. While a computer literacy class might consider financial analysis as beyond its scope, numerous available Excel templates can allow for simple introductions and examples to such analyses while still focusing on the application. With or without the use of templates, Excel can be used to crunch the numbers, employ formulas, and vary assumptions for what-if analyses. A break-even analysis is an ideal vehicle for creating best and worst case scenarios by varying assumptions related to price, profit, number of customers, etc. Excel also can be used to summarize analyses via charts. Different chart formats (e.g., line, column, and pie charts) and their variations can be used for different informational purposes for different types of data and thus can provide for lessons pertaining to effective data summarization. The details and mechanics of these charts also can be embellished and then integrated into an executive summary that references them as exhibits.

In addition to an integrative executive summary, the development of a business plan allows for two major presentation opportunities: one earlier in the process whereby the proposed product or service (as well as a marketing or competitor analysis) are presented to the class for peer review; and a final integrated presentation at the end of the semester. Obviously, PowerPoint presentations offer their own type of information summarization and lessons relevant to oral and visual communications that can be enhanced by features and functions of the software. Furthermore, if the computer literacy course includes a web component, a web summary can be constructed using Word and saved as an html document. Such a web synopsis would be "written for the web" based on online readability factors that emphasize conciseness,

use of lists, use of headings and subheadings, use of font styles and colors, spatial positioning, and perhaps most importantly, the ability to use hyperlinks to link to or "drill down" for more information.

While a web component may fit with a focus on communications, the business plan framework calls into question the relevance of a database component. Should Access be covered as part of computer literacy, or are the complexity and IS-intensive context of database software a better fit with the MIS course and its focus on organizational computing? The question goes beyond a matter of fit – it also is a point of practicality. Of the office application skills, not only is database mastery considered (by both employers and faculty) to be the least important to students as a whole (Bartholomew 2004; Hardy et al. 2006), but it also is ranked less than the other skills in terms of student and employer confidence (Bartholomew 2004). In fact, one study (Simis and Hoong 2001) showed that even after taking a computer literacy course, two thirds of the students still scored less than 70% on an Access proficiency test. Nevertheless, some coverage of Access may be value-added to introductory computing if placed in the context of how and why databases differ from spreadsheets; and to this end, a simple exercise (that can include forms and queries) geared towards the creation and management of a contact database (e.g., of potential customers) could be employed as a tangential but relevant component in the business plan framework.

Regardless of the breadth of applications covered, a business plan framework is a natural vehicle for using Word, PowerPoint, and Excel in an integrative context that adds value to an introductory computing course beyond the objectives of computer literacy and software proficiency. Part of this value is in introducing business and information concepts to students early in their studies, providing an important role in the business core curriculum. The relevance of the content also is enhanced by an integrative approach that can serve to relate various business functions and disciplines. However, the idea is not to focus on the mechanics and correctness of the business plan assignment, but rather to use it to advance to a higher-level of thinking and to focus on the "application" of information and technology. By advancing beyond software skills towards an attention to a higher-level context, the introductory computing course provides for more broadly applicable lessons and implications.

For example, the different types of summaries (executive, presentation, and even web) provide for value-added lessons pertaining to information problem solving. In particular, students can be instructed on concepts such as the coordination and subordination of topics and subtopics while learning how to fully use Word to take advantage of advanced formatting and structuring techniques relevant to such concepts. Likewise, students can be instructed on data summarization and the uses and functions of charts while learning how to build them with spreadsheet software. In addition to using software tools to analyze and present information, students also can use tools for information seeking (an early stage in information problem solving); and they can be instructed on online research methods for using databases and other web resources to collect information relevant to their business plan, especially with respect to a market/competitor analysis. Such instruction is especially important early in a student's studies.

One of the benefits of the business plan framework and an information problem solving approach is that they provide for a better understanding of the larger picture and the relevance of the content. Perhaps the most important competency in a systems class is to learn to think like an analyst and to understand the relevance and role of technology. In introductory computing, that competency would translate into an understanding of how to analyze and present information to solve an organizational need, and how to support that analysis with software tools. By going beyond a focus on software skills towards a higher-level context, the learning also can be shifted to a higher level. In addition, a transfer of ownership of the learning (in this case, by allowing students to develop their own entrepreneurial ideas and interests) likewise can support a shift to a higher level of thinking (Athanassiou, McNett and Harvey 2003). In terms extended from Bloom's Taxonomy, the focus is shifted from factual to procedural to strategic knowledge (Anderson 2005). Examples of this progression are described in Table 7.

Table 7: Example Competencies at Different Levels of Knowledge

Factual Knowledge ("What")	Procedural Knowledge ("How")	Strategic Knowledge ("Why")
Students will learn the: • functions of the software packages • components of a document • use of different graphs • the elements of Web pages	Students will learn how to: • use and navigate the various software packages, and to use Help functions in that process • create well-organized, integrated documents • summarize information (in graphs, tables, etc.) so as to effectively convey ideas • to effectively present information via Web pages	Students will learn to: • analyze and present information to address an organizational need • recognize and understand what makes analysis or presentation more effective • use software tools to make analysis or presentation as effective as possible • extrapolate beyond common features of a software tool so as to fully utilize its capabilities

This table identifies examples of different levels of competency that might be expected from an introductory computing course.

The objectives of introductory computing tend to focus on factual knowledge. Universities use computer based training (CBT) tools and assessment as a primary indicator of assurance of learning (Murphy et al. 2012). Tools such as MyITLab, SAM, and SimNet are among the most popular CBT computer proficiency assessment tools (Hill 2011). As these tools run office applications in a simulated environment, tasks can be defined and directly and definitively tested. Proficiency is determined by the successful completion of a certain percentage (e.g., 70%) of defined tasks. Table 8 provides two examples of assessed Excel skills (see Grant et al. 2009 for examples of assessed Word skills).

Table 8: Examples of Assessed Excel Tasks

murphy et al. (2012) …using myitlab	grant et al. (2009) …using sam 2003
Compute the Gross Pay	Merge cells
Use the IF Function	Copy cells
Start Microsoft Office Excel 2007	Center across selection
Apply Number Formatting	Insert worksheets into a workbook
Copy the Formulas with the Fill Handle	Locate and open existing work
Insert a Row and Compute Totals	Create formulas using the Sum function
Change the Chart Type	Use fill handle to copy a cell
	Create formulas using the If function
	Use absolute references

this table identifies examples of excel tasks that are assessed by cbt tools such as myitlab and sam. such assessments are implemented via simulations that score the percentage of tasks that are successfully completed.

With the introduction of the business plan framework, factual-based skills/tasks as described above still can and should be assessed. In addition, some higher level of learning can be assessed with respect to meeting, exceeding, or failing to meet established expectations. In the case of Excel, for example, procedural levels of knowledge could include the ability to: Create a spreadsheet using appropriate cell and page formatting; Use a spreadsheet to solve complex mathematical analyses; Use advanced functions to build logic into spreadsheet models; Create a graph to effectively communicate data and information

Furthermore, higher levels of assessment can be focused on the context of the tasks; and in the case of Excel, for example, could include the more strategic ability to: Create an effective sales budget; Create an effective break even analysis; Create an effective cash flow statement

Similar types of expectations can be established for Word and Powerpoint.

CONCLUDING COMMENTS

As a skills-based course focused on the teaching of software applications (i.e., focused on factual and/or procedural knowledge), introductory computing has embraced tutorials and computer-based training (CBT) and assessment. While the automated nature of these mechanisms allow for consistency and

scalability, it has inherent problems. To begin with, when compared to more traditional or interactive methods, the more mechanized CBT methods were found to be less effective (Simis and Hoong 2001; Merchant, Kreie and Cronan 2001) and less favorable to business school faculty (Kaupins 2002). The mechanized uniformity of CBT also can create problems when students come to a course with varying levels of skill (for example, students who are somewhat proficient can become bored with tutorials that sometimes are described as "painful"). Although introductory computing often employs procedures to "test out" the more proficient students, an assessment option can trivialize the necessity or value of the course. Furthermore, such an option signifies that the course's value lies solely at the level of computer literacy and software skills proficiency, which becomes problematic when studies (e.g., Bartholomew 2004; Johnson et al. 2006) show that the acquired proficiency is short-lived.

Although some might argue that the purpose of an introductory computing course is to focus on lower-level factual and/or procedural knowledge, it is the lack of emphasis on the higher-level knowledge that has created an arguably problematic course characterized (and perhaps trivialized) by computer based training and test-out options, and ultimately by questions of relevance. If brought to a higher level, introductory computing can become a meaningful course for all students, regardless of their level of software skill expertise. The course would no longer be focused on software skills but rather on the effective application of those skills in a larger context. Perhaps more importantly, that context – exemplified here with respect to the business plan framework – can position and differentiate introductory computing as a value-added core course in the business curriculum.

APPENDIX

Appendix A: Guide for Writing a Business Plan
...from http://www.sba.gov/content/templates-writing-business-plan as retrieved August 2012

Elements of a Business Plan
1. Cover sheet
2. Statement of purpose
3. Table of contents
4. Body of the document
    A. The Business
        1. Description of business
        2. Marketing
        3. Competition
        4. Operating procedures
        5. Personnel
        6. Business insurance
    B. Financial Data
        1. Loan applications
        2. Capital equipment and supply list
        3. Balance sheet
        4. Breakeven analysis
        5. Profit & loss statements
            Three-year summary
            Detail by month, first year
            Detail by quarters, second and third years
            Assumptions upon which projections were based
        6. Pro-forma cash flow
    C. Supporting Documents

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