



Crowdsourcing Management Education

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Abstract. Today, many business educators are undertaking significant reforms in the face of globalization, new learning technologies, soaring tuitions, and unprecedented economic uncertainty. One approach being adopted is to engage faculty and students in a crowdsourcing learning experience. Specifically, this new paradigm significantly alters the three pillars of traditional instruction—fixed time, fixed location, and fixed learning pace—with a more flexible, customized, and mobile learning environment. The purpose of this paper is to highlight the growing opportunities for crowdsourcing via social media in management education and to demonstrate how intelligent tutors can help facilitate this revolutionary metamorphosis in learning throughout the community of practice.

Keywords: crowdsourcing, social media, intelligent tutors, management education, mobile learning, implementation strategies, Web 3.0, agentagogical.

1. Introduction

Management education is under increasing pressure to respond to the growing demands from business, government, and students to offer programs more in tune with the globalized marketplace (Ain, 2010; Doh, 2010; Kao, 2011). One broad theme calls for the re-invention of business schools through the creation and delivery of alternative models of management education (Mamum, 2009; Thomas, H., 2012). A recent study, sponsored by the Association to Advance Collegiate Schools of Business, revealed a wide gap between the changing needs of the business community and the programs being offered by the business management community (Bruner, 2011). This report specifically calls for strengthening the use of international partnerships, expanding internationalization within the curriculum, and connecting various global activities through a comprehensive collaboration strategy. One approach for addressing these challenges is through the increased use of crowdsourcing (Howe, 2006). Crowdsourcing, as applied to management education, involves the process of connecting with a broad-based group of external resources, e.g., students, faculty, researchers, and the business community, for the general purpose of problem solving and developing new skill sets.

The expression “six-degrees of separation” is an apt metaphor. First proposed in 1929 by the Hungarian writer Frigyes Karinthy, six-degrees suggest that in a network, like the Internet, you can connect with any other member of the network through no more than five intermediates. This is the fundamental tenet behind the

crowdsourcing learning paradigm. Several assessments have been conducted on this theory, which have reasonably validated this estimate (Backstrom, 2012; Milgram, 1967; Watanabe, 2013). To that end, social networks continue to grow in popularity, particularly among the millennial generation, on a worldwide basis. This cultural and technological phenomenon suggests opportunities for utilizing social media throughout management education for enhancing the learning process and learning outcomes. Specifically, social media can open up multiple options for adding new dimensions to learning and knowledge acquisition by allowing students to connect in both formal and informal learning settings (Couros, 2009; Wodzicki, 2012). This pattern tends to mimic the increasing use of social media in the workplace. Social networks have improved workplace productivity by enhancing the communication and collaboration of employees, which aids knowledge transfer and consequently makes organizations more agile (Bennett, 2010). University faculty are also embracing social media. For example, nearly 60 percent of faculty in the professions (e.g., Management Education and Applied Sciences) are using social networking for professional purposes (Seaman, 2013). Can these trends in student and faculty use of social media translate into wide-spread adoption in the classroom? Some basic issues surrounding the employment of social networks in management education include: 1) Can social media enhance learning? 2) Do students wish to use social media in a course setting? and 3) Are faculty prepared to adopt social media to support the learning process?

Traditional college studies will be five times less important than they are today. The self-motivated learner will be on the web. And there will be far less place-based colleges - Bill Gates (Techonomy Conference, 2010, San Francisco).

The relationship between social media usage and an institution's learning management system (LMS) represents a dynamic that calls for considerable attention. Presently LMSs are viewed as one of the most important Internet technologies for enhancing student learning (Billsberry, 2010; Demski, 2010). A primary purpose of the LMS is to serve as the central repository for both content and student interactions. A well-designed LMS should be able to capture, record, and analyze student activity on an ongoing basis. For example, LMS-based data mining techniques can provide a quantitative assessment on student participation in discussion forums. These assessments can serve as a supplement to the instructor's direct review of the discussion thread (Dringus, 2005). Some specific performance metrics for this type of learning application include: 1) student posting time, 2) student response to other posting, 3) student sharing resources with others, and 4) citing of specific references. This ability to capture and process student inputs and outputs is one of the main reasons for integrating social media with the LMS.

When students are learning online, there are multiple opportunities to exploit the power of technology for formative assessment. The same technology that supports learning activities can also gather data that can be used for assessment. As students work, the system can capture their inputs and collect evidence of their problem-solving sequences (Bienkowski, 2012).

Engaging faculty, educational researchers, and administration in the crowdsourcing paradigm is essential for ensuring success. Specifically, the faculty provides the conduit for segueing from the traditional classroom format to a social media facilitated online learning environment (Betts, 2011; Diaz, 2011). There are a number of factors that need to be addressed so that the faculty can successfully make this transition including: training, development, and incentives (Brooks, 2010; Dellabough, 2012). Faculty driven collaboration networks can help facilitate the adoption of new learning technologies and modalities through access to community best practices (Al-Zoube, 2010; Vuorikari, 2011). Specifically, a management education collaboration network provides the business education community with the opportunity to converge, share, and exchange ideas to drive innovation in student learning.

The transition from Web 2.0 to Web 3.0 will further increase the opportunities to utilize social media in management education (Lal, 2011). This technological revolution will enable students to become even more creative and passionate in developing a learning identity and in enhancing their problem-solving skills.

The Internet has altered many of the traditional power relations in education. Tasks that were previously the domain of faculty are now under the control of learners: searching for information, creating spaces of interaction, forming learning networks, and so on. Through blogs, wikis, online video, podcasts and open educational resources, learners are able to access content from leading lecturers and researchers around the world. Through the use of social media, learners are able to engage and interact with each other and with researchers and faculty (Siemens, 2011).

This paper is organized as follows: 1) A literature review on the use of social media in management education, 2) An assessment regarding the growing role of intelligent tutors, and 3) A discussion of crowdsourcing implementation strategies. This paper's primary contribution to management education is to outline how crowdsourcing can be used to enhance the learning process and to identify specific implementation policies.

2. Literature Review

The use of social media in management education is on the rise as faculty continue to expand the opportunities for using electronic communications to

enhance the learning experience (Li, 2012; Meredith, 2012; Wankel, 2009). Applications such as blogging, podcasts, and document sharing have merely tapped the surface of what will be possible in management education over the next few years. Social networks can also be used to strengthen connectedness throughout the community of learners (Hung, 2010). Business educators, as they have done in the past, can take advantage of the new technologies being deployed in the business community (Leino, 2012; Pileggi, 2012). For example, business schools developed a Web 1.0 presence in the late 1990s as a means for student recruiting and content delivery. Today the business community is using Web 2.0 to increase consumer participation through enhanced network interaction. Typically, personal data is exchanged for widespread product and service access that is both convenient and timely. This web-centric framework can be applied to management education wherein the consumer becomes the student. In this context, the student trades prior performance and background data for customized content and access to like-minded collaboration groups. A key challenge to the management education community of practice is to keep pace with the rapidly changing technology landscape as organizations began to embrace Web 3.0 and beyond. Another requirement is to manage the complexity associated with the growing number of vertical and horizontal product offerings. Table 1 illustrates the evolution of web based learning from 1.0 to 3.0 in terms of several key characteristics. Internet learning started with Web 1.0, where users were limited to the passive viewing of content. Web 2.0 represented a major step forward in the learning process by permitting individuals and groups to interact and collaborate as creators and distributors of content. This approach exemplifies the andragogical learning philosophy introduced by Malcolm Knowles in the 1960s (Blondy, 2007; Forrest, 2006). Three key assumptions associated with the andragogical paradigm are: 1) Learning is problem-centered rather than content-oriented, 2) Learners are internally motivated and self-directed, and 3) Learners bring life experiences and knowledge to the learning process. These axioms are consistent with overall Web 2.0 structural design. Some examples of Web 2.0 in a management education learning environment include social networking, collaboration, video sharing, cloud computing, and simulations. Student co-production, which is based around their personal experiences, is another example of the andragogical model, which brings numerous benefits. In this context students and student teams participate in the design and delivery of specific course and curriculum content. The co-production model can lead to increased student satisfaction, reduced student anxiety, and improved educational outcomes. This andragogical perspective further enhances the value of the virtual learning community of practice and can be enhanced through the use of social media (Kotze, 2003; McCulloch, 2009). Many students now consider multitasking, customization, collaboration, and speed as the norm. They tend to dislike the classic lecture-based, information-dated, responsive-deficient silos of learning and instead are looking for a pro-active learning environment (Weyant,

2013). Management education's use of Web 2.0 technologies has resulted in the development of new student capabilities including: collaborative learning, independent learning, problem solving, team work, and a sense of global community (Foroughi, 2011). This is a type of skill set that is of growing interest to the business community.

Table 1 – Evolution of Web-Based Learning for Management Education

Characteristic/Version	Web 1.0	Web 2.0	Web 3.0
Learning Philosophy	Pedagogical	Andragogical	Agentagogical
Content	Read Only	Interactive	Dynamic
Instruction	Faculty-to-Student	Faculty-to-Student Student-to-Student	Faculty-to-Student Student-to-Student Tutor-to-Student Collaborative Groups
Learning Process	Fixed Pace	Co-Producers	Agile
System Costs	High	Moderate	Low
Extent of IT Outsourcing	Low	Low	High
Analytics Perspective	Limited	Selected Applications	Industry Wide Applications
Business Community Perspective	Graduates need significant retraining in problem solving	Graduates require some retraining in problem solving	Graduates possess entrepreneurial problem solving skills and spirit

Learning is not a spectator sport. Students do not learn much by sitting in the classes listening to teachers, memorizing pre-packed assignments, and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences and apply it to their daily lives. They must make what they learn part of themselves (Chickering, 1987).

The use of social media by faculty in higher education is growing (Moran, 2012):

- Nearly one-third of the faculty are presently using these technologies in the classroom.
- Online videos are by far the most common type of social media learning resource used in class or posted for viewing outside of class.
- Younger faculty, under 35, are twice as likely to use social media for instructional purposes as older faculty (over 55).

- Two of the most pressing faculty concerns about social media usage are privacy and integrity.

Social media also encourages a more pro-active approach to learning, provides access to new sources of information, enhances the collaboration learning process, contributes to an overall positive learning experience, and promotes innovation in learning (Borštnar, 2012; Rodriguez, 2011).

The beauty of new social and digital technologies is their immediacy, reach and flexibility. Alongside traditional teaching techniques, social media can be continually developed around any topic and incorporate current business events in the learning process as the events themselves unfold. Discussion can be guided initially by faculty, but be managed by students and monitored and supported by the institution itself. This sort of teaching can promote the business school globally as a forward-thinking online and innovative institution (Thomas, M., 2012).

For example, Twitter can be used as an educational tool to help engage students and to mobilize faculty into a more active and participatory role. Specifically, it has been found that students using Twitter show a significant increase in engagement as well as higher semester grade point averages (Junco, 2011). Furthermore, students and faculty tend to be more highly involved in the learning process in ways that transcend traditional classroom activities.

One benefit of participating in Twitter is that many practicing professionals also participate, e.g., textbook authors. Besides the networking potential, students receive feedback to their questions and ideas from practicing professionals, which serves to reinforce the relevance of Twitter participation and enhance their understanding of our course content and their enculturation into the professional community of practice. Through their participation in the Twitter community, students discovered resources and tools that they effectively applied to their coursework (Dunlap, 2009).

Twitter can also enhance student writing skills by increasing student-to-student and student-to-instructor interactions, which creates more opportunities for feedback, mentoring; self-expression, creativity, and risk-taking (Greenhow, 2012). In that regard, the development of creative writing competencies is ranked high by the business community (Jackson, 2012).

That being said, most of the Web 2.0 learning applications, e.g., Twitter, are by design human oriented, which can make it confusing for machines. With the advent of Web 3.0 the opportunities for improving the learning process are literally unlimited through the use of collaborative tagging, i.e., Folksonomy, (Dwivedi, 2011). Often the term Semantic Web is used to describe this development. The Semantic Web is characterized by two key features: 1) establishing common formats for the integration and combination of data gleaned from diverse sources, and 2) formulating language for recording how the data

relates to real world objects. The transition to Web 3.0 in management education will rely heavily on the use of artificial tutors. This new learning paradigm (i.e. Agentagogy) is defined by the author as follows:

The ubiquitous application of intelligent agents to support the learning process through the identification and delivery of customized content, know-how, and supportive resources.

Segueing from an andragogical (Web 2.0) to an agentagogy (Web 3.0) learning construct represents as much of a profound change as the shift that has occurred between the pedagogical and andragogical learning models. The adoption of Web 3.0 by schools of business will take management education to a whole new level. One of the major goals in transitioning to Web 3.0 is to better align the business school's mission and vision statements with the business community. A primary objective of this alignment is to make the transition of graduates from academia to business as seamless as possible. Fortunately, most students entering a program of management education already possess extensive social media skills (Kelm, 2011). This skill set is essential for mastering the use of networks and the management of cooperation and personal participation in the new educational paradigm. Furthermore, it is consistent with the business community's use of social media to enhance the decision-making process (Garrigos-Simon, 2012).

Quality of education should produce direct links between good educational practices and positive outcomes for students. Factors considered to be good educational practices should have strong links to post-occupational status, income, growth in leadership, and job-related skills (Pascarella, 2006).

Crowdsourcing is receiving increased attention throughout a broad range of business and government organizations (Agafonovas, 2013; Bott, 2012). Even the federal government sees merit in embracing the Web as a means to engage citizens, foster co-production, and encourage transparency (Wigand, 2011). In an academic setting, crowdsourcing, among other things, provides access to previously inaccessible intellectual capital (Way, 2011). For example, it offers a forum for faculty and students to present their ideas and problem-solving abilities in front of an entire community, whereas these ideas are frequently lost in translation when transmitted through traditional institutional channels. Crowdsourcing can assist students hone their problem-solving skills by accessing a large talent pool via social media. This learning strategy represents the ultimate in collaboration.

Students must take ownership of their own learning in exchange for multiple modes of engagement in familiar online social venues. At the same time, students must accept communal responsibility and provide mentoring in a quid pro quo environment where payment is non-material. Empowered by proven

techniques in social learning design and crowdsourcing, these new responsibilities promise more effective and efficient learning outcomes (Anderson, M., 2011).

As Web 3.0 continues to be deployed over the next decade, students will be able to participate using their mobile devices in a variety of project collaborations on a global basis and to employ artificial intelligence-based tutors to access many types of learning resources (Witbrock, 2008). Teaching students self-directed learning skills provides benefits that outlast individual courses and programs. An individual self-directed approach is insufficient, however, given the fast pace of change students encounter in their professional lives. Communities of practice combine self-directed and collaborative learning to meet the challenges of today's dynamic organizational environment.

As the use of social media becomes the norm, students become more adept and comfortable with communicating thoughts and ideas through the written word. This comfort level paves the way for increasing educational benefits through various collaborative techniques. The increasing availability and use of technology has allowed online education and hybrid courses to experience tremendous growth in recent years (Dubose, 2011).

Nevertheless, there is a risk in assuming that integrating social media into a course or program of study will automatically enhance student participation and promote better learning. The decision to use social media should be driven by appropriate and carefully considered learning objectives and goals (Fusch, 2011). However, the findings on the use of social media in management education are encouraging. For example, students were found to be favorably disposed toward the use of Facebook in a variety of management education courses, e.g., accounting, business law, and human resources (Barczyk, 2013). Specifically, students perceived that it enhanced their sense of social learning and connectedness, with older students experiencing a stronger effect. While not surprising, most student Facebook posting occurred outside the classroom. Related findings include: 1) perceived usefulness, external pressure, and compatibility of task-technology have positive effects on social media use; 2) the higher the perceived risk of using social media, the less likely faculty will use the technology to support the course; and 3) social media use has a positive effect on student's learning outcomes and their satisfaction (Cao, 2013).

Social media can also play a useful role in study abroad programs, which represent an important component of many business curriculums.

Study abroad is one means for students to experience and experiment with technologies that companies are using and will use in the future to communicate, connect, cooperate, and collaborate across borders. Although students can learn about these technologies in a normal classroom setting, there is no substitute for the experiential aspect of the course while learning about doing business in another part of the world. Because all students cannot participate in study abroad

opportunities, the use of technologies to bring the world of business to the classroom is becoming a viable option for providing global learning opportunities for students (Deans, 2012).

Along these same lines, social media can be particularly effective for commuter students, who tend to spend little time on campus interacting with classmates and the wider college community. University staff also have the opportunity to utilize social media as a vehicle to better support the services needed by students who live at a distance and commute to college or enroll online. Providing valuable content to students in social media venues they already use could increase awareness about overall institutional services. Additionally, offering a two-way communication portal to field various administrative type questions around enrollment, financial aid, and campus involvement can prove useful for students unable to spend time in campus offices due to work and other obligations (Davis, 2012).

Not all students possess the knowledge management and the self-regulatory skills to effectively use social media in a learning environment. Teaching students to become effective self-regulated learners can help them acquire basic and complex personal knowledge management skills that are essential for creating, managing, and sustaining learning using a variety of social media outlets (Dabbagh, 2012).

Virtual internships provide another opportunity to employ social media in a program of management education (Monteros, 2012). Internships are an effective vehicle for exposing students to complex organizational problems that call for a variety of analytical and soft skills. Through the use of social media students can remain in constant contact with both their faculty advisor as well as the employer. The experiences gained in an internship (paid or unpaid) are often an important factor in job placement after graduation. A virtual internship, as the phrase suggests, is simply an internship that is conducted over the Web. Of course, there can also be hybrid internships where some of the work is done in person and some conducted over the Web. However, a pure virtual internship offers the most flexibility and potential opportunities. Specific types of virtual internships include software beta testing, spreadsheet analysis, and market research. The data to date suggests that videoconferencing is the most useful communication tool in the context of virtual internships (Vriens, 2010). The education theories confirm that human interaction is a vital element in the learning process (Hennessy, 2012; Yoon, 2010). Experiential projects, like internships, have the potential to aid learning and enhance employment opportunities (Taras, 2013). The latest developments in social media and online collaboration tools make virtual internships, in particular, increasingly feasible.

The increased use of crowdsourcing via social media in management education will provide students and faculty access to the wider educational community of practice. Specifically, students and student groups can contribute

directly to online discussion forums and share work for peer review in a manner similar to the current practices of the business community (Mackey, 2011). Furthermore, the web-centric learning paradigm helps to increase student participation and promotes greater collaboration and deeper learning. A key challenge for the community of practice is to identify the best crowdsourcing practices such that students are motivated to contribute and participate more in the learning process (Ralph, 2013). Some key characteristics associated with an efficient crowdsourcing community of practice include (Monaghan, 2011):

- Encourages self-forming and self-governing groups
- Shares common interest or learning goals among members
- Creates new knowledge
- Promotes learning in a real-time context
- Facilitates the development of shared meaning

For example, the networking and social communication capabilities of Facebook offer a greater number of learning styles, provide for real-time learning, help facilitate an online community of practice, and increase the opportunities for faculty-student and student-student interactions. In that regard, business educators should expand their pedagogical portfolio, promote active learning through collaboration, and assess the effectiveness of various social networks (Munoz, 2009). Intelligent agents provide one approach for addressing these objectives.

3. Intelligent Agents

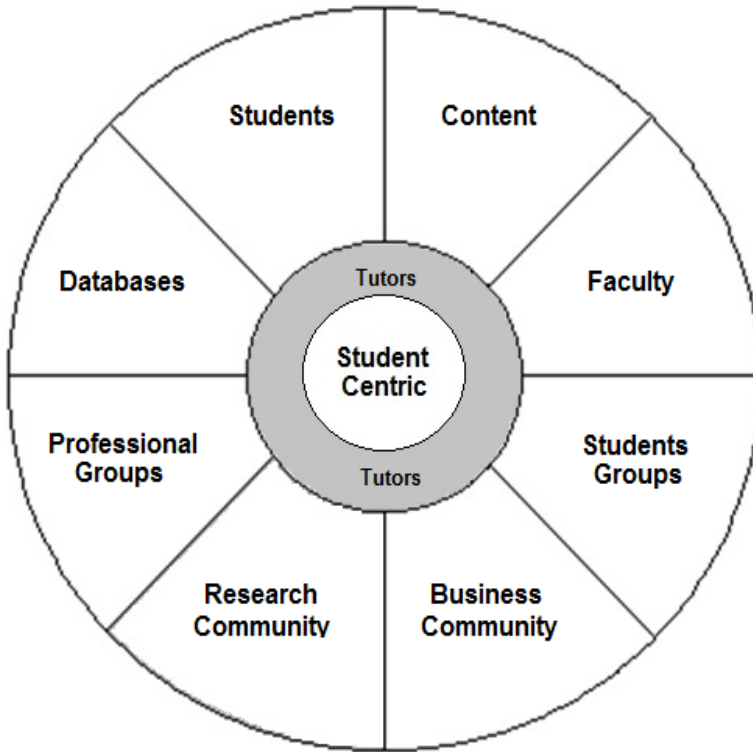
A fundamental tenet of management education is that one size does not fit all. That is, students do not learn at the same pace and they are impacted differently by the learning environment. For example, nearly 50 percent of students entering a program of graduation management education do not possess an undergraduate business degree (GMAC, 2013). One key to effectively using social media is a customized lesson plan wherein the specific strengths and weaknesses of each student are identified and measured with feedback provided. This is where intelligent tutors can play an important role (Aleven, 2009; Baker, 2011; Israel, 2007). The basic goal for using intelligent tutors is to acquire technology-enabled personalized learning as a means of achieving Bloom's Two-Sigma performance levels. Bloom found that the average student tutored one-to-one using mastery

learning techniques performed two standard deviations better than students who learn via conventional teaching methods (Bloom, 1984).

Intelligent tutors can be used to design lesson plans and learning experiences based on student performance and background. Tutors can also support an adaptive exploratory learning environment using a multi-layered interface design, where each layer's mechanisms and support resources are tailored to facilitate learning for a given situation. Based on a student's background, the agent would select the most appropriate interface layer for that context (Amersh, 2009). For example, if a student is having difficulty mastering a particular subject or theme as detected by testing, simulation, or self-assessment, then the tutor would prescribe specific additional learning content to the student. This content can take the form of videos, computing tutorials, or simulations. Conditional release technologies (CRT) provide a vehicle for offering students a wide variety of learning opportunities based on customized content (Gardner, 2011). A well-designed CRT can identify and deliver specific content based on student performance and characteristics. Students tend to participate more in learning systems that are content rich and that feature extensive variety (Sabourin, 2013; VanLehn, 2011). Generally speaking, educational-based intelligent tutors should possess the following four basic characteristics: autonomy, pro-activity, adaptability, and sociability. A well-designed intelligent tutor should be able to assess the student's current knowledge state and to modify both the lesson plan and content level accordingly. Additionally, the "social" interface between the tutor and the learner should be highly visual.

Figure 1 illustrates the overall design structure of an intelligent tutoring system as related to the learning process in management education. The model is inspired by recent research on computational representation of the knowledge and cognitive theories regarding human learning processes (Alexakos, 2006; Diziol, 2010).

Figure 1 - Agentagological Tutor Model Design



The student-tutor interface can display previous performance as measured by examinations or simulations. These data can be used to construct a customized lesson plan as well as provide for specific learning suggestions as gleaned from a case-scenario consultation. The agent also links to the overall curriculum to insure consistency. In a typical learning application the student is guided through a series of prompts for a given problem-solving application. Conceptually, the consultation can be viewed more than once since, among other things, some of the prompts are randomized. This type of learning construct has been used successfully in a variety of business disciplines including the fields of management and accounting (Oulhaci, 2013; Patrut, 2010). Another promising capability of intelligent tutors is to connect students based on common interests (Xiaoqing, 2007). Intelligent agents can organize students with similar study interests into project groups to facilitate cooperation and collaboration. Some additional useful characteristics of a learning agent include: 1) Visible at all times to the user within the educational milieu and 2) Interacts with the student using both verbal and non-verbal responses (Feituri, 2010).

With the advent of Web 3.0 *agentagogical* tutors will possess the capability to communicate with other tutors as a vehicle to identify and deliver customized content and learning as part of the problem-solving process. Intelligent tutors can help students solve new and more complex problems by articulating both current response errors, outlining their earlier experiences, and assigning new content. This interactive-problem solving learning approach represents the next step in Web-based tutorial instruction. The following principles have been identified as critical to the effective use of intelligent tutors (Anderson, J., 1987).

- Represent student competence as a production set
- Provide instruction in the problem solving context
- Promote an abstract understanding of the problem-solving knowledge
- Minimize working memory load
- Offer immediate feedback on errors
- Adjust the grain size of instruction with learning
- Facilitate successive approximations to the target skill

A fundamental requirement is that the tutoring agent should be informed by an accurate model of the target skill. The cognitive tutorial model, as outlined in Figure 1, is based on appropriate curriculum objectives and specific performance rubrics. Actual feedback options include (Corbett, 2000):

- **On-Path Actions:** Correct actions on the student's part are recognized if they are along one of the correct solution paths generated by the model. The tutor does not comment when the student is correct, but rather allows the student to progress with the solution.
- **Off-Path Actions:** If the student performs an off-path action, instruction is focused on getting the student back on path. Earlier tutors required students to always stay on path. More recent tutors allow the student to go off path, but still focus instruction on getting the student back on path when they are off path.
- **Error and Help:** Tutors possess two types of instruction. If the student makes a recognizable error a message can be given explaining why it is an error. If the student asks for help, a help message is presented to

guide the student to the correct solution. This message is generated from the information along a correct path.

There are a number of reasons for using intelligent tutors in a program of management education including:

- Assisting students to better understand the core material through the use of search engines and digital libraries.
- Supporting students in their quest to fill in the missing steps in the problem-solving process.
- Providing detailed feedback throughout the problem-solving and learning process.
- Serving as a vehicle to provide refresher material over the course of study
- Exposing students to technology that they will likely encounter in the business community.

Students using intelligent tutors have been found to learn more and have more confidence about the subject material (Dahotre, 2011; Veletsianos, 2007). These patterns indicate both the feasibility and effectiveness using intelligent agents as a substitute or supplement to traditional teaching methods in management education. Tutors can also help address the problem of student information *overload*. To best manage this situation, the faculty should develop a structured plan and mechanism for sharing information and managing interactions. The literature suggests that the main barrier for the adoption of such mapping mechanisms is the loss of information during the conversation (Iandoli, 2012). Mining student response data logged by intelligent tutoring systems has the potential to discover learning and usage patterns that are of value to the community of practice and even the tutors themselves; thus making the learning process more effective and responsive to both individual and group requirements (Mostow, 2006).

4. Crowdsourcing Implementation Strategies

Learning innovations like crowdsourcing are most likely to be accepted and used by the majority of management educators if success is experienced early on. This objective extends to the peer network, both within and outside the institution, thereby magnifying the impact on adoption and diffusion of the social media

learning paradigm (Bishop, 2010; Ward, 2012). Some specific implementation issues are highlighted below.

- **On-going peer support:** Complementing the experience of initial success, there should be ample "hand-holding" along the way of integration as other applications are introduced. Live peer support not only serves as assistance and encouragement; but it also contributes to the person-to-person communication that promotes diffusion throughout an educational community.
- **Real task activities:** Many management educators see technology in terms of helping address real problems. Initiatives designed to introduce and use learning technology should address real task activities and requirements. Using Internet access to information and resources via social media can address many management educational issues and requirements.
- **Ownership and identity:** Encouraging and enabling management educators to "create an active presence" on the Web is essential for adopting new learning technologies. Participating in webinars, creating a personal home page, and publishing electronic papers all contribute to the electronic-world-community and help ease "cultural assimilation."
- **Design philosophy:** Crowdsourcing networks are fit for purpose. The purpose determines how the network is structured and used. Governance is the process for managing both joint and individual work and consists of both structural and behavioral components.

The adoption of a crowdsourcing learning framework is based on a number of factors including ease of use, functional value, costs, and access. The ongoing evaluation of student readiness provides the focus and feedback needed to support the institution's capability to maintain superior levels of quality and service. On the cost side of the equation, crowdsourcing offers a relatively inexpensive way to tap into the resources and opinions of a committed community of learners (Sharma, 2011). The transition to a crowdsourcing learning universe in management education presents a number of challenges including: 1) tracking the evolving nature of mobile learning, 2) supporting a fragmented landscape, 3) processing a growing amount of data and information, and 4) accounting for varied institutional demand and usage (Guhr, 2012). One approach for addressing these challenges is through the use of Computer-Supported Collaborative Learning (CSCL), which focuses on the use of social media as a mediation tool within collaborative methods of learning (Caballe, 2010). CSCL applications are characterized by a high degree of user-user and user-system interaction and hence are generating a large amount of quantitative information (e.g., log files) from

both synchronous and asynchronous collaboration. Social media-based academic networks now exist beyond traditional learning management systems and opens up the academic environment to a public space.

We need large-scale and in-depth studies that examine tweeting practices among various learner subgroups. We also need studies that practice connected methodologies, collecting data on youth-initiated tweeting practices—and the potential learning opportunities therein across school and non-school settings (Leander, 2008).

Social-networking tools, such as CSCL, provide the capability to attract, motivate, and engage students in meaningful communicative practice, content exchange, and collaboration (Zaidieh, 2012). Two important characteristics of social network-based learning are flexibility and repeatability. The convenience and flexibility of accessing content and knowhow via social media can enhance the learning process. Furthermore, the ability of the student(s) to review the content and material on multiple occasions is typically not a characteristic of the traditional face-to-face programmatic approach. To assist in this process, data mining tools can be employed to: 1) select student groups with similar characteristics and reactions to learning strategies, 2) discover new knowledge using students performance data, 3) suggest interesting learning experiences, 4) locate students who exhibit low motivation and find alternate means of reaching them, and 5) predict student performance outcomes (Romero, 2010).

Work, travel, lifestyle and geographical distance are moving students into alternative modes of delivery such as fully-on-line and blended. For some students, this is less than optimal, but necessary if they are to obtain an advanced education. The increasing use of Web technologies and blended learning strategies in higher education may lead to a future where students can feel as connected to their peers and instructors in fully-online and blended programs as they do in traditional face-to-face modes of delivery (Ladyshevsky, 2013).

The following is a three-phased approach that can be used in implementing the crowdsourcing paradigm (Panckhurst, 2011):

1. An initial phase where students become acquainted with each other in the network,
2. A project phase where the students and instructor interact on a specific assignment (e.g., timely business news issue) so that the students can gain experience and understand instructor expectations, and
3. A continuous phase where the instructor/tutor provides interactive feedback with the students on an ongoing basis throughout the course.

This implementation approach is consistent with the following four strategic objectives established by the European Education and Training Commission regarding the use of social networking in the learning process (Redecker, 2010).

- **Enhancing innovation and creativity:** Supports more participatory and useful approaches to learning, provides new formats for creative expression, and encourages learners and teachers to experiment with different ways of articulating thoughts and ideas.
- **Improving the quality and efficiency of provision and outcomes:** Offers a broad variety of versatile tools that address different channels and allows learners to be more actively engaged in constructing their own learning process.
- **Making lifelong learning and learner mobility a reality:** Actively supports lifelong learning by offering accessible, flexible, and dynamic learning environments that can complement and supplement initial training.
- **Promoting equity and active citizenship:** Helps mitigate existing inequalities and can be employed to successfully re-engage individuals who are at risk of exclusion from the knowledge society.

To this end, the crowdsourcing paradigm, as outlined in this paper, can effectively increase the accessibility and availability of learning opportunities for the hard to reach and can significantly improve motivation and participation in the learning process. Research spanning more than two decades suggests that a key challenge lies in developing the social practices and approaches that can take advantage of the technological affordances of the learning system (Brett, 2010). Today, one of the challenges facing the integration of social media based technologies into the educational process is that the practices associated with social media usage in the broader culture may conflict with those found in many schools of business. This is one area calling for more research and assessment. Several essential features of a crowdsourcing learning environment include (Erenli, 2011): 1) multi-dimensionality user interfaces for increasing member acceptance, 2) real time user activities, 3) data mining capabilities, and 4) collaboration features for sharing and versioning of documents.

From the students perspective “ease of use” and “accessibility” are two key factors in the implementation process. Fortunately, these requirements are consistent with many of the networking systems currently operating (Wiid, 2013). Ultimately, the successful implementation of the crowdsourcing paradigm in management education will depend on matching the appropriate tool set with the learning tasks at hand. In this regard, business educators might wish to eschew

specifying a particular technology and instead identify an overall process which students can use to discover the best approach for addressing the given problem or activity (Tay, 2011).

We must localize our use of social networking technologies; one size does not fit all. The transition to a social media learning environment should be gradual. Students need to be ready for their public performance, and building confidence is essential. Enhanced feedback via Analytics is a must. Students enjoy seeing longitudinal data that suggest they are improving (Netzley, 2012).

5. Conclusions

Management education has entered into a seminal period that is being driven by globalization, technology, economic uncertainty, and demographics. Business schools need to better align their product mix with the changing needs of the business community. One approach is to embrace social networks that continue to grow in popularity among the millennial generation on a worldwide basis. This cultural and technological phenomenon suggests opportunities for utilizing social networks in management education in much the same way as it is being used in industry and government. This paper's primary contribution to management education is to outline how crowdsourcing via social media can be used to promote enhanced learning strategies and to identify specific implementation policies. Crowdsourcing can support the learning process through a variety of network arrangements including: one-to-many, many-to-one, one-to-one, and many-to-many. This approach can help reach students at a distance and seek reactions and feedback in a discrete manner. With the advent of Web 3.0 social media devices will be able to exchange learning data and information in a more efficient and timely manner. Intelligent tutors can help encourage students to develop an entrepreneurial mindset where they will feel more empowered and prepared to take risks in learning. Achieving early success in the introduction of new learning innovations like crowdsourcing is a key factor for developing widespread acceptance and use by the majority of management educators. By offering tailored learning opportunities via social media business schools can leverage the intellectual potential of learners who may have been challenged by the traditional classroom setting. To that end, Web 3.0 will offer both enhanced learning opportunities and learning outcomes and will position management education graduates to better meet the dynamic challenges of the workplace.

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