



Research in online and blended learning in the business disciplines: Key findings and possible future directions

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ABSTRACT

In this literature review, we examine and assess the state of research of online and blended learning in the business disciplines with the intent of assessing the state of the field and identifying opportunities for meaningful future research. We review research from business disciplines such as Accounting, Economics, Finance, Information Systems (IS), Management, Marketing, and Operations/Supply Chain Management. We found that the volume and quality of research in online and blended business education has increased dramatically during the past decade. However, the rate of progress is somewhat uneven across disciplines. IS, Management, and multi-disciplinary studies have the highest volumes of research activity, with markedly less activity in Finance and Economics. Furthermore, scholars of online and blended business education predominantly publish in learning and education journals of the business disciplines rather than also publishing in journals that focus on technology-mediated learning, thereby missing an opportunity to inform scholars in other disciplines about their work. The most common research streams across disciplines were outcome comparison studies with classroom-based learning and studies examining potential predictors of course outcomes. Results from the comparison studies suggest generally that online courses are at least comparable to classroom-based courses in achieving desired learning outcomes, while there is divergence in findings of comparisons of other course aspects. Collectively, the range of untested conceptual frameworks, the lack of discipline-specific theories, and the relative absence of a critical mass of researchers focused on the topic suggest ample opportunities for business scholars seeking to enter this research community.

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1. Introduction

Consistent with broader trends in higher education, the delivery of education via the Internet has taken on increasing importance for business schools (Popovich & Neel, 2005). With this increased importance has come increased research attention toward the study of online and blended learning in business education during the first decade of the 21st century. However, although meta-analyses have reported that courses in business delivered via distance education fare comparatively well to their classroom-based counterparts (Sitzmann, Kraiger, Stewart, & Wisner, 2006; Zhao, Lei, Yan, Lai, & Tan, 2005), recent literature reviews of online learning generally have ignored work originating from the business disciplines (Bernard et al., 2004; Larreamendy-Joerns & Leinhardt, 2006; Moos & Azevedo, 2009; Tallent-Runnels et al., 2006). Therefore, for the benefit of business educators, administrators, and educational research, a review of the research on online and blended learning in business education seems particularly warranted.

Historically, researchers of online and blended business education have tended to rely on literature from their own respective disciplines.

Although such an approach may ground a study in the prior works of a particular field, it also means that advances in other disciplines are ignored (Arbaugh, 2005a; Bryant, Kahle, & Schafer, 2005). This approach to researching online and blended business education has produced at least three negative consequences. First, advances in methodological and analytical approaches initiated in one discipline are not shared, resulting in widely varying research quality between disciplines (Arbaugh & Warell, 2009; Malhotra, 2002). Second, researchers in one discipline remain unaware of theoretical perspectives and conceptual frameworks from related disciplines that could help explain phenomena in their own discipline (Wan, Fang, & Neufeld, 2007). Third, those with administrative responsibilities have little evidence to guide them when making decisions regarding the comprehensive design, emphasis, and conduct of the subjects addressed in undergraduate and/or graduate business programs.

To address these research and curricular concerns, we examine and assess the state of research of online and blended learning in the business disciplines with the intent of assessing the field and identifying opportunities for meaningful future research. We review research from the business disciplines of Accounting, Economics, Finance, Information Systems (IS), Management, Marketing, and Operations/Supply Chain Management. For each discipline, we identify the primary issues addressed and noteworthy results of the

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studies. Because of the increasing number of studies whose samples are not housed within a single discipline, we also devote a section to findings from multi-disciplinary and non-disciplinary studies in business education. We hope that this review will raise awareness among researchers within each business discipline of the types of research being conducted in other disciplines, encourage more cross-disciplinary research in business education, and increase consideration of discipline-specific characteristics when designing and conducting online and blended business courses.

2. Review protocol

This literature review focuses on articles that examined virtual learning environments where the course content and participant interaction is conducted at least partially online. An initial comprehensive search for peer-reviewed articles pertaining to “on-line learning” in business courses that were published after January 1st, 2002 was conducted between September 2006 and September 2008. Databases examined in the review included ABI/Inform, Business Full Text, Business Source Elite, and Lexis/Nexis Business. Terminology used in the search is provided in Table 1. To supplement this review, articles on technology-mediated business and management education published before this time period cited in reviews by Arbaugh and Stelzer's (2003) and Salas, Kosarzycki, Burke, Fiore and Stone (2002) were included in this review. Finally, the primary journals for each business discipline, as identified in the journals database recently published in *Academy of Management Learning & Education*, were examined dating back to 2000 (Whetten, 2008). This protocol identified 182 articles that examined online and/or blended learning in business and management education from the years 2000 through 2008. Categorizations of these articles by discipline/topic area and by journal are presented in Tables 2 and 3, respectively.

3. Pre-2000 research in online business education

To gain an appreciation of the context in which the study of online business education has developed, a brief review of studies published before 2000 is instructive. Studies of the use of technology-mediated

Table 1
Terms used in the literature search.

Disciplines	
• Management	
• Finance	
• Accounting	
• Marketing	
• Information Systems	
• Operations/Supply chain management	
• Economics	
Search terms for on-line	
• Blended	
• Mediated	
• Technology-mediated	
• Distance	
• On-line	
• Virtual	
• Web-based	
• E	
• Cyberspace	
• Computer based	
• Computer assisted	
• Distributed	
Search terms for learning	
• Education	
• Learning	
• Teaching	
• Instruction	

Table 2
Article breakdown by discipline area, 2000–2008.

Subject area/discipline	Number of articles
Multi-disciplinary/Not discipline-specific	47
Management	41
Information Systems	37
Accounting	19
Marketing	15
Operations/Supply chain management	12
Finance	6
Economics	5

communication in business education began in the early 1990s. Not surprisingly, the focus on technology meant that IS scholars housed in business schools, led by Maryam Alavi, Dorothy Leidner, Sirkka Jarvenpaa and their colleagues, were the first to extensively examine this phenomenon. After initial studies showed favorable results from using technology to deliver business education (Alavi, 1994; Alavi, Wheeler, & Valacich, 1995; Leidner & Jarvenpaa, 1993), Leidner and Jarvenpaa (1995) developed a framework that matched technology applications to predominant learning theories. This framework suggested that asynchronous communication technologies would be best suited for collaborative learning approaches, thereby stimulating the study of group behaviors in technology-mediated learning environments (Alavi, Yoo, & Vogel, 1997; Chidambaram, 1996; Hightower & Sayeed, 1996; Jarvenpaa, Knoll, & Leidner, 1998; Jarvenpaa & Leidner, 1999; Strauss, 1996; Warkentin, Sayeed, & Hightower, 1997). Although the collective results of these studies investigating if the technology resulted in improved learning were inconclusive, the studies did support the idea that the participation amongst group members was more democratized in technology-mediated environments and that after students navigated the learning curve of the medium, they could develop productive collaborative relationships with their teammates.

Table 3
Article breakdown by publication, 2000–2008.

Journals referenced	Number of articles
Decision Sciences Journal of Innovative Education	18
Journal of Education for Business	13
Journal of Marketing Education	9
Journal of Management Education	8
Business Communication Quarterly	7
Management Learning	7
Marketing Education Review	7
Academy of Management Learning & Education	6
Accounting Education	6
Education + Training	6
Journal of Information Systems Education	6
Journal of Educators Online	5
The Internet and Higher Education	4
British Journal of Educational Technology	3
Information Systems Research	3
Information & Management	3
Issues in Accounting Education	3
Management Research News	3
American Journal of Distance Education	2
Communications of the ACM	2
Decision Support Systems	2
Informing Science	2
International Journal of Management	2
Journal of Accounting Education	2
Journal of Behavioral and Applied Management	2
Journal of Instructional Psychology	2
Journal of Business Ethics	2
Journal of Financial Education	2
Journal of Online Learning and Teaching	2
Journal of the American Academy of Business, Cambridge	2
Personnel Psychology	2
Journals with only one article	39

Studies on online learning in other disciplines also began to emerge during this time, albeit primarily as narrative accounts of instructors' initial experiences and adaptations of classroom-based exercises for delivery online. Such accounts appeared in educational journals for the management (Bailey & Cotlar, 1994; Berger, 1999; Taylor, 1996) and marketing (Ellram & Easton, 1999) disciplines. Conceptualizations of course development and initial reports of student reactions to online learning environments also began to appear (Bigelow, 1999; Hislop, 1999; Meisel & Marx, 1999; Mundell & Pennarola, 1999; Shrivastava, 1999). Although these reports generally were favorable toward delivering business education online, one study of an undergraduate course in statistics and economics found that students that took a purely online version of the course showed smaller gains in achievement than their classroom-based counterparts (Chizmar & Walbert, 1999). As we will see, the influence of these initial studies on the topics and approaches taken within the respective disciplines continues to this day.

4. Online and blended learning research within and across business disciplines, 2000–2008

4.1. Management

Considering that the historical roots of the online business education literature are thoroughly grounded in the IS discipline, it may be a surprise to some that the Management discipline would have the most articles (41 peer-reviewed articles published since 2000) included in this review. However, management faculty appear to be the most likely to teach online at AACSB International-accredited business schools (Alexander, Perrault, Zhao, & Waldman, 2009), and several distinct subdisciplines are housed within this discipline. Strategy, Human Resources, Organizational Behavior, Entrepreneurship, and International Management each have distinct content areas, within which there are varying degrees of activity in online teaching and learning research. Three primary themes emerge from studies within the management discipline: narrative accounts of instructor experiences and best practice; empirical studies of student perceptions, attitudes, and behaviors regarding the delivery of online courses; and comparison studies of courses offered in online and classroom-based formats.

Although narrative accounts as a percentage of studies published has dropped substantially since the 1990s, such accounts still are common in the management discipline, particularly in the entrepreneurship area (Hegarty, 2006; Mendenhall et al., 2006; Mennecke, Hassall, & Triplett, 2008). Similar accounts also were provided in international management (Rusinko, 2003) and labor studies (Budd, 2002). Salmon (2000) reported the Open University's experiences with adopting the FirstClass system for use in several undergraduate and MBA-level courses in management. She noted that students and faculty generally were positively disposed toward the delivery medium. Her most noteworthy finding was that relative to classroom-based settings, online courses allowed and even required reflection as part of the learning process. An advance on the narrative approach can be found in Brower's (2003) and Walker's (2004) works. Brower (2003) reported on her experience with developing and delivering an Executive MBA-level OB/HR course based upon principles from the learning community creation literature. As a result, she identified potential issues such as managing over-participation and determining an optimal class size for an online learning environment that have yet to be addressed fully by subsequent online learning researchers. She advised instructors to resist the temptation to dispense wisdom, but rather to promote student discovery by staying out of the online discussion unless it needed redirecting, and to encourage student engagement by creating course structures and grading approaches that encourage interaction. Walker (2004) discussed effective practice in managing conflict in an online professional communication course. She particularly noted the

use of discourse normalizing approaches such as complimenting fellow posters, generalizing issues, and agreeing with only part of controversial statements as discussion management strategies.

A second stream of research addresses student perceptions and behaviors. Through their studies of e-collaboration through courses offered by the Open University, Allan and Lawless (2003) identified three sources of student stress with online learning: (1) technology issues, (2) collaboration issues, and (3) trust. Their study of 200 students in an 18-day course revealed that a lack of trust and social presence early on were large contributors to the stress. To address these sources of stress, the authors suggested posting personal pages and some collaborative activity early in the course to get learners to interact with each other to increase trust. Koohang's (2004) study of student perceptions of digital libraries in a blended undergraduate management course found gender and experience-based differences. He found that men and experienced online learners tended to be more favorably disposed toward digital libraries.

Several studies have found that student familiarity and comfort level with using the technology increased over the duration of a course, resulting in discussions of increasing complexity and quality as the course progressed (Allan, 2007; Dineen, 2005; Eveleth & Baker-Eveleth, 2003; Silberg & Lennon, 2006; Yoo, Kanawattanachai, & Citurs, 2002). Counter to Bigelow's (1999) early concerns, subsequent research in the management discipline has found that the online learning environment has increased student confidence about working in virtual teams (Clark & Gibb, 2006; Dineen, 2005; Olson-Buchanan, Rechner, Sanchez, & Schmidtke, 2007). Group cohesiveness, trust, and cognitive styles also have been found to be significant predictors of team dynamics in strategy courses (Liu, Magjuka, Bonk, & Lee, 2007; Liu, Magjuka, & Lee, 2008; Williams, Duray, & Reddy, 2006). However, findings on the group dynamics–learning outcomes relationship have been equivocal. Williams et al. (2006) found that group cohesiveness mediated the teamwork–learning relationship, but neither Clark and Gibb (2006) nor Liu et al. (2007, 2008) found any significant relationships to learning outcomes.

Other studies in management have examined student behaviors. Hwang and Arbaugh (2006) examined student feedback-seeking behaviors in a study of seven blended undergraduate HR and management topics courses. They found that students who tended to engage in positive feedback-seeking behaviors tended to participate more intensely in discussion forums and seek feedback both inside and outside of class meetings. Students engaging in negative feedback-seeking behaviors tended to seek instructors outside of classroom activities and participate in more discussion forums but with less intensity. Murphy and Tyler (2005) examined the relationship between learning approach and knowledge transfer to the workplace using a sample of both undergraduate and MBA students. They found that deep learning approaches focused on understanding and interacting actively with course materials were associated with knowledge transfer, but a strategic approach of time and effort management was positively associated with course outcomes. Baugher, Varanelli and Weisbord (2003) reached similar conclusions regarding consistency of logging onto the course site versus login volume in a study of blended sections of an undergraduate Management and Organizational Concepts course. Although cumulative GPA was the dominant predictor, they found that students who logged onto the course site more frequently between classroom-based course sessions had stronger course performance. However, total hits on the course site were found to negatively predict performance. Hartman, Lewis and Powell (2002) analyzed some 1100 e-mail messages from 303 students to the instructor for an MBA Management Communication distance course and concluded that technology proficiency, topic affinity, the ability to answer one's own course questions, and a need for interpersonal communication were the primary drivers of student emails. In a multi-class section study of 243 undergraduates, Martins and Kellermans (2004) found that although instructor

encouragement influenced student perceptions of system usefulness, peer influence and encouragement was the strongest driver of whether students actively used a course management system. Peer influence also may explain Driver's (2000, 2002) findings of large differences in social interaction and content knowledge between the beginning and ending in an MBA course on organizational change. Students liked discussion boards and PowerPoint presentations more than audio/video presentations in online courses.

A third major theme addresses student performance relative to classroom-based courses and other disciplines. Although they found no differences in course performance outcomes, early studies of participant behaviors in strategy courses found that women participated significantly more than men in online class discussions (Arbaugh, 2000b,d). Subsequent comparison studies have incorporated larger, multi-course samples. Friday, Friday-Stroud, Green and Hill (2006) found no significant difference in examination scores across delivery mediums or disciplines in a study of both classroom-based and online undergraduate courses in Strategy and Organization Theory. In their study of seven undergraduate courses, Daymont and Blau (2008) not only found no difference in quiz or final grade performance between online and classroom courses, but also found that semester GPA was the only consistently significant predictor of student performance. Sauers and Walker (2004) found that students in a blended course perceived a course management system to be more useful than their classroom-based counterparts, but did not see their writing skills improve as much. Even studies reporting experiences that were less than optimal observed several reasons other than the subject matter or the delivery medium to explain those outcomes, such as scheduling issues, differences in student populations, or technological failures not related to the delivery medium (Crow, Cheek, & Hartman, 2003; Lapsley & Moody, 2007).

The comparison stream of research in the Management discipline has begun to move from mere comparisons of student examination scores toward theoretically grounded comparisons of performance and other aspects of the course experience. Lapsley, Kulik, Moody and Arbaugh (2008) examined online and classroom-based sections of an undergraduate course in Human Resources through the lens of equivalency theory (Simonson, Schlosser, & Hanson, 1999). They found that when equal experiences (assignments, lectures, and activities) were provided in both learning environments, students in the online course performed better than the classroom-based students.

Although generally at a lower level of conceptual and methodological sophistication, studies of other management-related topics report favorable reactions to online delivery. To date, reports exist for courses in ethics (Painter-Morland, Fontrodona, Hoffman, & Rowe, 2003; Walker & Jeurissen, 2003), technology management (Liyangan & Poon, 2003), and project management (Hannigan & Browne, 2000). These favorable findings suggest that additional research should be conducted to determine whether content, curricular, and/or conduct factors are most influential in influencing participant attitudes toward these courses.

Finally, this emerging stream has collected enough articles to warrant initial critiques. In an exchange regarding research methods, Hodgson and Watland (2004a,b) and Arbaugh and Benbunan-Fich (2004) debated appropriate research methods for studying online management learning. Hodgson and Watland contended that given the assumptions of collaborative and constructivist learning models that drive many models of online learning (Leidner & Jarvenpaa, 1995), management education researchers should focus more on qualitative research methods than on quantitative research methods. Although they did not disagree with the importance of qualitative methods, Arbaugh and Benbunan-Fich cautioned that the emerging field should allow for diversity in research methods. Based on the preponderance of empirical studies of online business education, perhaps Arbaugh and Benbunan-Fich should have been more concerned that qualitative methods would not receive adequate consideration.

4.2. Information systems

The topics addressed within the IS discipline reflect both its longer research history and its grounding in the technological aspects of virtual learning environments. In addition to the online/classroom comparisons, student perceptions, and predictors of course outcome studies published in the other disciplines, IS education scholars have published works detailing conceptual frameworks and examining effects of specific technologies on student learning.

4.2.1. Conceptual frameworks

Following the example provided by Leidner and Jarvenpaa's (1995) framework, IS scholars have taken a leadership role in the business disciplines in developing conceptual and theoretical frameworks of online learning effectiveness. Alavi and Leidner (2001) argued that IS scholars should be interested in technology-mediated learning because of increased demand for postsecondary education and the applicability of IS research to help the academy design and deliver education most appropriately and effectively. To encourage such research, they proposed a framework that posited that learning outcomes were the product of the mutual influences of information technology, instructional strategies, and psychological processes in a given instructional context. Subsequently developed frameworks have provided alternative perspectives, developed applications for specific contexts, or attempted to address gaps in prior frameworks. Holsapple and Lee-Post (2006) adapted DeLone and McLean's (2003) information systems success model to e-learning settings by focusing on system design and elements of quality, system delivery, and system outcomes. Examples of context-specific conceptual frameworks include Benbunan-Fich's (2002) model of objectivist and constructivist approaches to synchronous and asynchronous delivery, Sharda et al.'s (2004) model for applications of immersive technologies in education, and Miliszewska's (2007) model of blended learning in transnational degree programs.

Recent conceptualizations of online learning effectiveness in the IS literature have attempted to incorporate elements of these existing frameworks to develop a more comprehensive model. Seeking to build upon Alavi and Leidner's (2001) framework, Wan et al. (2007) recently claimed that IS scholars haven't focused enough on characteristics of individuals and learning outcomes. Their framework argues that effective technology-mediated learning is a function of the interaction of participants' (both students and instructors) characteristics, technology, and instructional design. This interaction then influences learning processes, which in turn influences psychomotor, cognitive, and affective learning outcomes. Unlike previous technology- or instructor-oriented or learner-oriented frameworks, this approach allows for the possibility of students and instructors to co-create learning experiences, which, given the advent of Web 2.0 applications, may be a more appropriate approach going forward.

Unfortunately, although IS scholars have been actively involved in developing conceptual frameworks, generally they have not been as active in testing them. Other than Holsapple and Lee-Post's (2006) model (and even their study had a sample of only 39 online students), none of these frameworks have been subject to empirical testing. For that matter, with the exception of recent studies that have built and tested new models based upon their framework (Arbaugh & Benbunan-Fich, 2006; Benbunan-Fich & Arbaugh, 2006), the same can be said for Leidner and Jarvenpaa's (1995) conceptualization. Needless to say, such disconnects between conceptualizations and verified models create opportunities for future researchers.

4.2.2. Studies of technology

Because how people work with information systems in organizations is a primary focus of this discipline, it is not surprising that we see studies from IS education scholars that focus on the technologies used to conduct online and blended learning in business education.

This literature stream reflects the rapidly changing applications of learning technologies. Historically, web-based business education courses have relied extensively on text-based transmission of course content and discussion. This is true for a number of reasons, such as limited bandwidth, minimum hardware/software requirements for students, and the learning curve required for both students and instructors. Such factors may, in part, explain why initial studies of course management software found that e-mail-driven systems produced higher learning outcomes than did multimedia systems in courses with mid- to senior-level managers (Alavi, Marakas, & Yoo, 2002). However, as bandwidth increases, wireless technologies become more prevalent, and software applications become more sophisticated, MIS education scholars increasingly are examining user-driven applications and the use of Web 2.0 technologies.

Studies examining the use of virtual “third places” in business education to date have seen mixed results. McPherson and Nunes (2004) found that constructing a virtual social site as part of a Masters in IT Management program was not used as much as was hoped. A survey of 16 of 34 students found that although the site contained interesting information, it did not draw much activity from program participants, so after a while students avoided it to go directly to their particular online course. Conversely, in their study of a “third place” for students in an undergraduate database design course, Baker-Eveleth, Eveleth and Sarker (2005) found that the third place became a tool for (social) relational development, collaboration, and cohesiveness. These divergent findings suggest that degree program and student professional maturity factors may influence the relative effectiveness of such tools.

Early studies of information systems and simulation courses found that push technologies, those that deliver content directly to users, compared well relative to technologies that required students to access content themselves (Parikh & Verma, 2002). This background explains, in part, why we are beginning to see more extensive studies of such technologies and Web 2.0 applications in online MIS education. Extending the concept of push technologies, Cao, Crews, Lin, Burgoon and Jr. Nunnemaker (2008) examined the impact of “virtual interaction,” defined as student interaction with a rich media representation of an instructor who provided targeted lecture video clips when students clicked on various keywords. Using five different treatment groups with varying levels of learner control of the virtual instructor, they compared student learning and perceptions relative to classroom-based delivery. Although all groups had significant increases in learning performance, there were no significant differences between the groups. Based upon these findings, the authors suggested that blending classroom-based and virtual interaction may lead to more effective learning. In a study of push technology that was not instructor-dependent, Santhanam, Sasidharan and Webster (2008) examined the extent to which a learning platform could help undergraduates in IT skill development. They found that the use of positively reinforcing scripts provided at the beginning and at the midpoint of the study significantly predicted student learning. Finally, tools such as blogs and wikis are beginning to be examined as learning tools. An example of this is provided by Watson, Boudreau, York, Greiner and Wynn's (2008) discussion of graduate students' use of wikis and open source software to co-create a textbook on programming in XML.

4.2.3. Online/classroom comparisons

Comparison studies of online and classroom-based courses were a prominent theme in IS during the past decade. Early studies showed no differences between the two delivery mediums in terms of exam performance (Abraham, 2002; Piccoli, Ahmad, & Ives, 2001; Sankaran, Sankaran, & Bui, 2000), but some found significant differences in student attitudes toward the Internet as a delivery medium. Although they found no differences in overall scores between the two mediums, Sankaran et al. (2000) found that students who had more positive

attitudes toward the medium to which they were assigned showed significantly higher score improvements than students in their class section having less positive attitudes toward that medium. In a subsequent study, Sankaran and Bui (2001) found that performance differences were attributable to student learning strategies and motivation rather than to the characteristics of the delivery medium. Piccoli et al. (2001) found that although students in the online class they studied had higher computer self-efficacy, they were less satisfied with their course experience than were their classroom-based counterparts.

Subsequent comparison studies in IS examined a broader variety of delivery formats and outcome measures and found differences in academic performance and participation behaviors. When comparing blended and classroom offerings of an undergraduate IS course, Bryant, Campbell and Kerr (2003) found that students in the blended course performed better on exams, but classroom students performed better on group projects and activity-based assignments. Using groups of mixed modes of synchronous and asynchronous delivery methods in an MBA-level information systems course, Clouse and Evans (2003) found that the combination of asynchronous content delivery and synchronous chat session produced the poorest performance on discrete exam questions, but that the combination of face-to-face content delivery and asynchronous discussion produced significant improvement on open-ended exam questions. Heckman and Annabi (2005) compared the transcripts of student group case discussions in online and face-to-face sections of an IS capstone course. They found that students in the online discussions tended to take much more responsibility for creating the cognitive and social environment than did their classroom-based counterparts, and were more likely to demonstrate higher order cognitive processes as a result. The online students in the study were much more likely to respond to each other after posting responses to the instructor, while classroom students tended to respond to the instructor only. Medlin, Vannoy and Dave (2004) found similar patterns for participating with the instructor in their study of an undergraduate IS course. In a comparison study that also included blended learning environments, Webb, Gill and Poe (2005) compared a range of blends on the purely classroom–purely online continuum in the delivery of a case-based graduate level IS course. Controlling for several student demographic and experience characteristics, they found that the blended course offerings scored higher perceptions of the learning process and course outcomes. Similar controls were adopted by Jones, Moeni and Ruby (2005) in their study of a blended course on telecommunications for IS majors, but they found only a moderately significant relationship between the delivery medium and knowledge gain scores. Conversely, Al-Shammari (2005) found that web-based collaboration was significantly less effective for the development of knowledge-based skill than classroom-based tools in a process engineering course for IS students. He found that classroom-based role play exercises scored particularly well on skill development. Recent studies are beginning to take longitudinal and theoretically grounded approaches to comparing the delivery mediums. Consistent with the predictions of media naturalness theory, Kock, Verville and Garza (2007) recently found that although classroom-based students had higher learning outcomes at the midpoint of an undergraduate IS course, these differences were gone by the course's end.

4.2.4. Participant characteristics, perceptions, and behaviors

An emergent research stream of studies has examined the relationships among participant characteristics, behaviors and course outcomes in online IS courses. Student characteristics that have been examined to date include personality, learning styles, and cultural orientation. The preliminary results of such studies suggest that conscientious, creative, and compliant students perform well in online IS courses, but extroverted students tend to have poorer performance (Kim & Schniederjans, 2004; Schniederjans & Kim, 2005). However,

although learning styles have not been found to significantly influence performance amongst IS students, but ethnicity may predict performance (Lu, Yu, & Liu, 2003). The potential impact of regional and cultural differences received additional support in Wresch, Arbaugh and Rebstock's (2005) study of an MBA-level IS course that combined students from German and American universities. They found that German students were much less likely to participate in online discussions than were American students. Hornik and Tupchiy (2006) examined the impact of cultural characteristics amongst a U.S.-centric population in an Introduction to IS course of 1100 students at the University of Central Florida and found that individualists tended to use the delivery medium less than collectivists, and were more likely to be dissatisfied with the medium and perform poorly in the course.

The primary behavioral characteristic studied in online IS courses to date is participant interaction. Recent studies have found that although being more difficult initially, interaction with other participants has enhanced student performance and attitudes toward online learning (Cappel & Hayen, 2004; Heckman & Annabi, 2005; Yuksekturk & Top, 2005–2006), and may be enhanced through the use of experiential exercises (Pauleen, Marshall, & Egort, 2004). Johnson, Hornik and Salas (2008) examined social presence as a system design feature and its influence on application-specific computer self-efficacy, perceived usefulness, and course interaction in an online undergraduate IS course. They found that system social presence predicted satisfaction with the course and the value of its content, but did not predict learning performance. Participant interaction predicted performance and satisfaction. Student self-efficacy and perceived usefulness of the system predicted perceived content value, satisfaction, and learning performance. Other system-related studies have examined attitudes and behaviors influencing course management system usage. Saade (2007) and Saade and Bahli (2005) tested a model that integrated motivation, learning goal orientation, and cognitive absorption with Davis' (1989) *Technology Acceptance Model* (TAM) to predict student usage of an online learning tool in an undergraduate IS course. These studies found that although motivation and learning goal orientation predicted students' attitudes toward the system, cognitive absorption was more likely to predict actual usage.

Finally, two studies used faculty respondents. Neville, Heavin and Walsh (2005) examined shifts in faculty roles as a result of the implementation of blended learning environments. Findings from interviews with IS faculty suggest that active learning techniques can help students engage in higher order learning, which may not be the case otherwise with e-learning. The respondents felt the faculty needed to play a more facilitative role in online learning environments, and that they should provide clear, structured, and well organized learning outcomes for students. Conversely, Sarker and Nicholson's (2005) faculty interview study found that there were widely ranging opinions on the extent to which online learning environments should be student-centered, that there was disagreement on whether instructors should completely abandon the "sage on the stage" role, and that a course is not inherently more interactive merely because it is delivered online. This divergence of responses suggests the relative newness of this research topic and indicates ample opportunities for inquiry by future researchers.

4.3. Accounting

Considering the relative lack of transferability of the accounting discipline's research methods to educational research, it is surprising that the discipline is so well represented in this review. Although we found only 19 articles specifically focused on the accounting discipline, two of these attempted to assess the state of research in the field and how it might be advanced. Bryant et al. (2005) noted a dearth of both empirical and descriptive accounting-based research and asked what accounting educators might learn from research

efforts in other areas. They considered equivalency theory, constructivism, behavioralism, cognitivism, and social cognitive theory in their conceptual framework, which argued that effectiveness in teaching accounting online was a function of the interaction of factors pertaining to communication media, course organization, the learners, and the instructor. Such factors also have been conceptualized to be important for successfully delivering accounting courses in blended formats (Zabriskie & McNabb, 2007). They also encouraged accounting faculty to examine variables such as types of courses, requisite skills, assessments, appropriate uses of online and classroom delivery mediums, and the role of faculty experience in future research. To date, research in the accounting discipline has addressed topics such as instructors' narratives of their experiences with online courses, classroom comparison and classroom supplement studies, predictors of learning effectiveness, and conceptual models and reviews.

Reports of comparison studies in accounting show a variety of approaches and findings. Accounting principles courses appear to be the most frequently-studied in this stream. Although performance outcomes generally were comparable to those of classroom-based courses, student attitudes toward the medium varied widely. In a study of 128 students in four sections of principles in financial accounting course taught by two different instructors, Basile and D'Aquila (2002) found no significant differences based on the delivery medium, but found significant differences based on the course instructor. Another study of principles of accounting courses taught by two instructors found that students in the one online class section tended to have higher exam scores (Campbell, Floyd, & Sheridan, 2002). A third comparative study of accounting principles by Vamosi, Pierce and Slotkin (2004) examined student attitudes toward classes that rotated between live lectures and lectures distributed via the Internet during the second half of the course. They found no significant differences regarding student attitudes toward the technology between pre- and post-course surveys, but found that course satisfaction declined significantly after the introduction of streamed lectures. However, student perceptions of distance learning were much more positive in the post-course survey.

Chen and Jones (2007) and Jones and Chen (2008) compared blended and traditional offerings of an MBA-level managerial accounting course. Their initially published study of two blended and two classroom courses (Chen & Jones, 2007) found that students in the blended courses reported higher levels of learning, but that students in the classroom courses thought that course instruction had more clarity. Although students in the blended course found the format to be less effective than students in the classroom course, they also indicated they were interested in taking more blended courses in the future. In a subsequently published study, these scholars found that students in the blended learning format reported better access to and contact with the instructor, but were concerned about instructor presentation of material and student–student interaction during online meetings. Blended groups tended to have more interaction outside of class and were more likely to consider their interaction effective, but also were more likely to rely on one or two students in the group to carry the load (Jones & Chen, 2008).

Studies of fully online accounting courses have tended to be narrative accounts of instructors' experiences. Dunbar (2004) reported her experiences with 115 students completing a compressed MBA-level Tax Accounting course on WebCT during Summers 2001 and 2002. For most of the students, this was their first experience with both a graduate level course and an online course, and the transition was not easy. Dunbar reported shifting to a more flexible course format between the first and second course offerings. She concluded that online instruction can be as effective as face-to-face instruction, and found she spent comparable total time on the online class as on the face-to-face version. Aisbitt and Sangster (2005) discussed the design and administration of an online assessment in an undergraduate certificate of accounting

course offered in the UK. They addressed topics such as the selection of course software, question selection, student orientation, and technological and administrative problems operating the system. They reported that student feedback was quite positive. In a more conceptually grounded account, [Borthick and Jones \(2000\)](#) reported their experiences with designing and conducting a synchronously-delivered information systems assurance course grounded in a framework of collaborative discovery that was based upon cognitive, social, and market forces. Student reactions generally were positive, and they found no differences in student performance when compared to a classroom-based section of the course.

There has been an emerging stream of studies on online supplements to classroom-based Accounting courses during the last decade. In a study of 22 MBA students, Web-based writing and self-tests significantly improved accounting students' writing skills ([Cleveland & Larkins, 2004](#)). [Lane and Porch \(2002\)](#) assessed a Computer-aided Learning (CAL) package (EQL's *Understand Accounts*) and its impact on undergraduate non-accounting majors and their perception of the tool and attitudes toward accounting at a UK institution. They found that age and attitude toward the subject were positively associated with exam score, but there was no relationship between perceptions of the tool and exam score. They also found that attitudes toward ease of use of computers positively changed from the start to end of the course, but attitudes toward computers as a learning tool were lower. [McDowall and Jackling \(2006\)](#) conducted a similar study on the effect of computer assisted learning tools (General Ledger and Quick Books Pro). They found that perceived usefulness of General Ledger positively predicted final exam scores, and being an international student negatively predicted final exam scores. However, this might be explained by the fact that international students have less prior experience with accounting software. [Gammie, Gammie and Duncan \(2002\)](#) reported that students found that the flexibility and opportunity to apply learning to work were the big advantages of an online module on auditing, but that developing, assessing, and accessing the module were seen as concerns.

Other studies in accounting have examined predictors of attitudes toward course management systems and learning effectiveness in online learning environments. [DeLange, Suwardy and Mavondo \(2003\)](#) examined student attitudes toward design features and attributes of WebCT as a virtual learning environment. They found that four factors were associated with improved student learning motivation: availability of lecture notes, bulletin boards, online assessments and the availability of chat and audio summaries. Studies that have examined the use of Blackboard as a supplement to classroom instruction in accounting courses have found that lecture note and content availability and announcements were the strongest predictors of overall perceptions of the course management system ([Love & Fry, 2006](#); [Wells, DeLange, & Fieger, 2008](#)). Although the students in these studies found Blackboard to be useful and rewarding, it was clear that they saw the course management system as a content repository instead of a mechanism for engaging their fellow classmates. Other studies found that prior subject knowledge and the amount of time spent on the course management system were the primary predictors of exam performance, but that student attitudes toward online learning were mixed ([Marriott, Marriott, & Selwyn, 2004](#); [Potter & Johnston, 2006](#)).

4.4. Marketing

The majority of the 15 articles in the marketing discipline can be arranged into three categories: course overviews and instructor narrative accounts, classroom comparison studies, and studies that identify predictors of course outcomes in online learning environments.

Although online and blended marketing courses have not received as much research attention as courses in management or IS, the discipline's literature on the topic has been examined in two reviews in *Marketing Education Review* by Naresh Malhotra and colleagues. In his first review,

[Malhotra \(2002\)](#) took the marketing education community to task for its methodologically limited empirical research on technology-mediated learning. He called for increased use of more experimental designs, longitudinal studies, and more rigorous statistical analysis. He also argued that such studies required convergently valid measures, more control variables, and the simultaneous use of cognitive, attitudinal, and behavioral measures if they were to aid our understanding of the phenomenon. In a second review of 77 studies reviewing the various roles the Internet plays in marketing education (11 of these studies dealt with online education), [Close, Dixit and Malhotra \(2005\)](#) concluded that "distance education does weigh heavily on the future of the Internet in marketing education" (p. 88). However, the effective use of the Internet may be hindered by inadequate faculty familiarity with its pedagogical benefits and limitations, an obstacle even more pronounced for faculty trained in the field before the advent of the Internet. The authors believe that "institutional support focusing on educating faculty on the use of the Internet in the classroom and on distance learning is crucial" (p. 92).

This decade has seen several articles where instructors provided overviews for designing marketing courses for online delivery. These overviews considered factors such as course design and faculty issues ([Eastman & Swift, 2001](#); [Jones & Kelley, 2003](#)), migrating courses in logistics from classroom-based to blended learning environments ([Holley, 2002](#)), and designs for student participation in discussions ([Sautter, 2007](#)). Other studies have examined marketing faculty attitudes toward online education. In a study of 135 North American and European marketing faculty, [Kuster and Vila \(2006\)](#) found that North American instructors were more likely to use distance learning and perceive it more favorably than their European counterparts, but given the commitments of many European institutions to investing in learning technologies, this may not be the case for much longer.

The decade also has seen several comparison studies of online and classroom course experiences. Although student performance tends to be the most commonly used comparison point in such studies, some studies in the marketing discipline examined characteristics other than course outcomes. [Smith \(2001\)](#) compared designs for online and classroom-based versions of her MBA-level marketing planning course, reporting that the classroom-based course was more exam- and presentation-based, and the online version was more simulation- and discussion participation-based. [Berry \(2002\)](#) compared 32 student teams (15 classroom, 17 online) from six MBA strategic marketing courses and found that online student groups had greater perceptions of group cohesiveness, but there was little difference in perceptions of satisfactory group interaction process and satisfactory group outcomes. There were no significant differences between the student teams in usage and skill in using the Internet. [Priluck \(2004\)](#) found that although students in a classroom-based principles of marketing course reported higher skill development and course satisfaction than students in a blended class section, the class sections had comparable exam scores. Because the classroom section was a daytime course comprised of traditional undergraduates and the blended course was an evening course comprised of predominantly non-traditional students, these differences may be attributable to factors other than, or in concert with, the delivery medium. In a comparison of online versus face-to-face discussion activities in a consumer behavior course, [Sautter \(2007\)](#) found that a different set of learning objectives can be accomplished with each approach. For example, if the learning objectives call for developing logical reasoning and critical thinking skills, building written communication skills, or encouraging a greater diversity of perspectives, the online discussion format may prove more effective. However, if the learning objectives include developing active listening skills, building oral communication skills, or developing contemporaneous thinking skills, the face-to-face discussion method may be more beneficial.

Recent comparison studies in marketing have examined course outcomes directly. [Weber and Lennon \(2007\)](#) compared four (two classroom, two web-based) sections of a principles of marketing

course during a two year period. They found that the delivery medium didn't significantly predict learning outcomes (GPA was by far the strongest predictor), but that the use of the online delivery medium negatively predicted satisfaction. Hansen (2008) examined whether online learning was more appropriate than classroom-based learning for the development of applied learning, and therefore superior in the process of knowledge transfer. After controlling for student prior theoretical knowledge and academic maturity, he found that online students performed better on the presentation and plan portions of a marketing plan assignment, but found no differences between class sections in the plan's proposal portion. Online students also felt a greater community with their teams and that communicating with the professor was more important than did the classroom-based students.

A stream of research identifying predictors of student attitudes toward virtual learning and other outcomes in online and blended marketing courses has emerged during this decade. In a study of a Strategic Marketing course offered by the Athabasca University, Larson (2002) found that involvement from instructor/coaches was more likely to impact group interactivity than was group size. However, lesser coached groups reported higher quality interaction. McGorry (2003) used four online sections of an MBA course in Marketing to test a model for evaluating quality in online programs. Using survey items that measured flexibility, perceived learning, participant interaction, perceptions of the technology, technical support, and student satisfaction, she found a four-factor model centered on course organization, student learning, participant interaction, and individual flexibility. Simon, Haghirian and Schlegelmilch (2003) examined synchronous virtual classrooms embedded in traditional global marketing management courses at five different schools in multiple countries over a one year period. These virtual classrooms comprised the equivalent of two class sessions. They found that instructor and technological characteristics were significant predictors of course effectiveness and that student characteristics such as course involvement and attitudes toward information technology did not predict course effectiveness. Robinson (2006) may be the first to examine the applicability of Venkatesh, Morris, Davis and Davis's (2003) *Unified Theory of Acceptance and Usage of Technology* (UTAUT) to online business education. In a study of 102 students in two undergraduate marketing courses, he found that student attitudes toward learning technologies such as course management systems and the social influence of others were the most prominent predictors of whether students intended to use them.

4.5. Operations/supply chain management

The primary stream of studies in the Operations Management discipline is the comparison of online and classroom-based courses. To date, results of these studies are mixed. In a multi-semester comparative study, Lawrence and Singhanian (2004) found that classroom students scored 6.5 points higher on tests and were 15.7% less likely to drop the class. However, the gaps between the two mediums narrowed over time. Anstine and Skidmore (2005) found that online students in MBA-level statistics courses performed below students in classroom-based offerings. Conversely, Grandzol (2004) found no differences in student performance in his online and classroom-based MBA statistics courses. Other studies have reported no differences in course outcomes, but that undergraduates in online operations courses may be more likely to disengage from the course than those students in classroom-based courses (Dellana, Collins, & West, 2000; McLaren, 2004). Other studies suggest that such differences may be instructor conduct-related instead of medium- or content-related. For example, Brower (2003) contrasted her highly participant interaction-oriented OB/HR management course with a quantitative methods course offered concurrently where the instructor used the course discussion board as a help desk rather than a

vehicle for facilitating discussion and encouraging higher order thinking. This might explain why group cohesion behaviors were found to be under-represented in studies of a business research methods course (Conaway, Easton, & Schmidt, 2005). Also, although an operations management course received relatively lower student ratings in Arbaugh and Duray's (2002) multi-course study, that course also had the largest enrollment, and class section size was negatively associated with course outcomes in that study. Palocsay and Stevens (2008) compared a specialized software package, a textbook tutorial supplement, and instructor-generated quizzes and found no differences in student final exam scores among the tools. They found that student GPA and instructor experience with the tools were the primary predictors of exam scores. Such results suggest the need for additional studies to assess the causal effects of outcomes in operations-related courses.

Other studies of operations management and business statistics courses generally have focused on examining student attitudes toward taking such courses online. These studies have shown that student reactions to online and blended courses in operations management and business statistics generally have been positive (Cybinski & Selvanathan, 2005; Greasley, Bennett, & Greasley, 2004; Seal & Przasnyski, 2003; Wild & Griggs, 2002).

In an effort to apply concepts from their discipline to online learning, Aggarwal & Adlakhia (2006) developed a TQM model of web-based courses based on 1) Quality Planning, 2) Quality Design, 3) Quality Management, and 4) Quality Assessment & Improvement. The model was designed to create quality interaction in the first week of the course and encouraged instructors to solicit feedback from alumni when creating an online course. Examples such as this could help show business school faculties how to bring theoretical perspectives from their respective disciplines into their design and conduct of online and blended courses.

4.6. Finance

Although behavioral and perceptual characteristics of students in finance courses have been examined as parts of samples in several multi-disciplinary studies, studies that focus exclusively on finance in online and blended learning environments are somewhat limited. Our review found six such studies published since 2000. These studies can be organized into three categories: technology-mediated education as a classroom supplement, experiences in teaching fully online courses, and web-based financial tools and simulations.

To date, studies examining online and blended learning technologies as classroom-based course supplements suggest that students are favorably disposed toward their use. In a study of two sections of a classroom-based undergraduate principles of finance class, Wilson (2003) found that student usage of a supplemental course management system was positively associated with course performance. However, student age, GPA, and major were stronger predictors of performance, and the study's design did not allow for separating the effects of student effort and the delivery medium. In one of the first studies of the use of podcasting in any business discipline, Reimers and Singleton (2008) found that using the technology was relatively easy, inexpensive, and well received by students in MBA-level courses in investment management and financial statement analysis.

To date, studies of fully online courses in finance largely have been anecdotal accounts of instructors' initial experiences with online teaching. Mariola and Manley (2002) reported their experiences with teaching an online course on derivatives, focusing primarily on course design issues. They managed the course using a synchronous chat format, and recommended raising student comfort level with chats before moving to more difficult course topics. Hayes (2007) provided a comprehensive discussion of her design, assignments, and delivery of an undergraduate level introductory finance course. Comparisons of online offerings and classroom-based versions of the same course over

a four-year period showed that the online courses had higher student withdrawal rates and lower course pass rates, but that student evaluations for the course formats were comparable. She attributed these differences to factors such as lack of student experience with navigating online environments and the disproportionate representation of part-time and non-traditional students in the online sections.

Part of the reason for the limited success of online finance courses may be due to the nature of finance material. At the risk of over-generalizing, much of the challenge in finance, especially in upper level courses, is not as much understanding the theory as it is trying to apply it. To a large extent the fields of economics and statistics share this characteristic. Note that in the discussions of online learning in economics and statistics, studies also found little success with online learning in upper level courses.

Beyond the use of course management systems, web-based financial tools and simulations have begun to receive research attention. Ford, Kent and Devoto (2007) examined the use of web-based financial commentary on vicarious learning about financial markets. Using a treatment sample of 68 undergraduates, they found that students exposed to a site for 6 weeks showed higher financial market awareness than a 30 student control group. They also found that finance majors tended to be more engaged in the course than non-finance majors. Wang (2006) reported on the design and development of a web-based gaming and simulation environment for financial engineering. Preliminary data from 96 teams totaling 253 students who had not used the system previously showed that most students rated the system highly and were eager to try it, although experienced online learners were slightly more favorably disposed toward the system. Almost all students surveyed thought it would be helpful in their learning and/or self-paced studies.

4.7. Economics

In spite of being a discipline that received attention relatively early in the emergence of this research stream (Chizmar & Walbert, 1999), research in online and blended education in economics has lagged relative to other disciplines in business schools. Our review identified only five peer-reviewed studies published since 2000. Each of these studies had a comparative orientation. Three of the studies found that student performance was higher in classroom-based courses. Brown and Liedholm (2002) compared two classroom-based, one blended, and two fully online sections of an undergraduate course in microeconomics and found that online students performed worse relative to expected scores given their ACT scores and relative to those in classroom-based courses, particularly as the course content became more complex. The authors found that half the online students spent three hours or less a week on the course, suggesting that factors other than the delivery medium may explain this finding. The other two studies finding stronger performance in classrooms built upon Brown and Liedholm's (2002) study by controlling for self-selection effects. Coates, Humphreys, Kane and Vachris (2004) controlled for potential selection bias by measuring student commute time to campus and measuring the prior experience of students and their friends with web-based instructional techniques. Their study of 126 students from six courses at three different institutions found that after controlling for selection effects, students in online class sections on average scored 18% lower on *Test of Understanding College Economics* (TUCE) than did students in classroom-based course. However, they also found that the online students scored 8–10 percent higher on the TUCE than they would have had they taken the course in a classroom, suggesting the possibility that the online and classroom-based samples were in fact different student populations. Anstine and Skidmore (2005) compared student performance in a sample of eight MBA-level economics and statistics courses, four delivered online and four taught in classrooms. In addition to controlling for student demographic characteristics, they also considered instructor experi-

ence and endogenous learning choice variables in their study. They found that students in the online statistics courses scored significantly lower than students in classroom-based settings.

Conversely, Navarro and Shoemaker (2000) found that after controlling for age, gender, ethnicity, class level and cumulative GPA, students in an online section of an introduction to macroeconomics course significantly outperformed those in a classroom-based section on final exams. They also found that neither student computing skill level, the use of English as second language, nor distance of residence from campus predicted whether a student chose to take the online version of the course. Cox, Carr and Hall (2004) compared synchronous chat sessions of a post-graduate Images of Africa course with those from a course in International Trade Bargaining. Most students found these chat sessions to be helpful. These authors concluded that success in delivering education online was a combination of the effects of course design, facilitation style and group dynamics.

4.8. Multi-disciplinary/program-level studies

The largest category of articles reviewed is those that could not be categorized in a single business discipline. There were both conceptual/narrative and empirically-derived publications in this category. Non-empirical articles tend to focus on either general conceptual frameworks of effectiveness or discussions of best practices in online business education. Empirical studies in this category are either broad-based institutional surveys, single-institution studies explicitly designed using courses from several disciplines, or program-level studies that survey students about their collective experiences with online learning instead of with a particular course. Results from studies of institutional surveys suggest that although the number of AACSB International-accredited schools offering online courses is rising, lower tier schools are more likely to have online degree programs, and that those programs are more likely to be at the graduate level (Ozdemir, Altinkemer, & Barron, 2008; Popovich & Neel, 2005). Faculty appear to be more satisfied with the online teaching experience than at the beginning of the decade, and instructor concerns regarding online teaching have diminished substantially during the decade (Alexander et al., 2009). Single-institution/program-based studies have diverged into several streams, including topics such as participant interaction, the role of technology, disciplinary effects, student and instructor characteristics and behaviors, and institutional surveys.

4.8.1. Conceptual models and best practices

This decade has seen the development of several general frameworks for effective online and blended business education. Walker (2003) argued that distributed learning theory could help instructors transition to teaching online because it encourages the instructor to help students learn from each other and shifts the instructor's role in part to helping students assimilate to the online learning environment. She suggests that one benefit of this approach is that it enables instructors to help students assimilate into future workplace environments. Business schools' ability to provide both classroom and online learning environments as assimilation vehicles to the workplace was emphasized in Balotsky and Christensen's (2004) model. In a more detailed discussion of the instructor's role as assimilator, May and Short (2003) used a gardening metaphor to characterize educating undergraduate business students online. They presented a framework where faculty are analogous to gardeners and students are the garden's by-product. They likened online course design and teaching strategies to the gardener's feeding and watering activities. Although Proserpio and Gioia's (2007) framework primarily addressed future uses of technology in undergraduate classroom-based environments, their conclusions regarding potential instructor roles are generalizable to online and blended learning. The primary instructor roles they

identified were for instructors guiding students to accurate sources of information online as a “search bot,” facilitating students' ability to make interpersonal connections on a discussion board or groupware, and helping students make complex interdomain connections through simulations and games.

Other frameworks address characteristics of learning effectiveness within online learning environments more explicitly. Using an e-marketing strategy framework, [Granitz and Greene \(2003\)](#) proposed the use of personalization, community, disintermediation, remediation, consumer tracking, mixing bricks and clicks, and enhanced customer service strategies to offset the faculty-, student-, and course content-related challenges to developing an online degree program. Building upon work on online dialogue and course structure from the educational literature, [Millson and Wilemon \(2008\)](#) argued that graduate management education that requires a high dialogue/low structure framework is the most conducive to a positive student online experience. [Rungtusanatham, Ellram, Siferd and Salik \(2004\)](#) developed a general model of learning effectiveness as a function of content factors, delivery-related factors, and learning factors. These factors, in turn, generated four models of online education delivery: two types of content overview models, a technical skills model, and a managerial learning model. [Arbaugh and Benbunan-Fich \(2006\)](#) grounded their model of epistemological teaching (objectivist vs. constructivist) and social learning (individual vs. group) dimensions directly upon [Leidner and Jarvenpaa's \(1995\)](#) seminal conceptual framework. Their empirical test of this model, which used a sample of forty online MBA courses from multiple disciplines conducted over nine semesters, found that courses designed in a mode of what they called group-based objectivism, where group-oriented learning activities were incorporated with instructor-centered content delivery, were found to have the highest levels of student perceived learning. Individually-based objectivist courses scored lowest in delivery medium satisfaction. Another article that reported testing of a model was provided by [Peltier, Schibrowsky and Drago \(2007\)](#). This model, updated from their earlier framework ([Peltier, Drago, & Schibrowsky, 2003](#)), argued that learning quality in business education was a function of the pacing of course content, participant interaction, course structure, instructor mentoring, and content presentation quality. Although they found several significant relationships between the predictors in a sample consisting of students from eighteen courses in multiple disciplines during a single semester, only instructor mentoring and the pacing of course content were strongly associated with learning quality. From a program-level perspective, [Hollenbeck, Zinkhan and French \(2005\)](#) provided a model with steps for developing a successful online MBA based on their experiences. The model focused on providing reliable technology, building community among students, and incentivizing faculty to teach in the program as initial program building blocks. They also emphasized the importance of a program coordinator, whose roles were to ensure proper communication in the planning process, high interaction between students and faculty, and implementation of the assessment process.

4.8.2. Participant characteristics and behaviors

Several multi-disciplinary studies have examined participant characteristics and behaviors. To date, student characteristics have received much more research attention than instructor characteristics. The student characteristics most examined are age, gender, and prior experience with technology and online learning. Recent studies generally have found no relationship between student age and online course outcomes in business education ([Arbaugh, 2002, 2005b; Hwang & Arbaugh, 2006; Larson, 2002; Webb et al., 2005; Williams et al., 2006](#)). Most recent studies also have failed to find a significant relationship between gender effects and online learning outcomes ([Anstine & Skidmore, 2005; Arbaugh & Rau, 2007; Larson, 2002; Williams et al., 2006](#)). As studies have been able to include learners with more varied amounts of online learning experience, we are beginning to see increasing evidence of a prior experience–course

outcomes relationship ([Arbaugh, 2005a; Arbaugh & Duray, 2002; Drago, Peltier, Hay, & Hodgkinson, 2005](#)). These improvements in student attitudes toward online business education may not require extensive online experience. In an analysis of students that participated in up to seven online MBA courses, [Arbaugh \(2004\)](#) found that the most significant changes in student perceptions of the flexibility, interaction, course software, and general satisfaction with the Internet as an educational delivery medium occurred between the students' first and second online course.

Consistent with [Hollenbeck et al.'s \(2005\)](#) counsel, participant interaction and its impact on course outcome has received substantive attention in multi-disciplinary studies. The findings of this research emphatically suggest that learner–instructor interaction is one of the strongest predictors of student learning ([Arbaugh, 2000c, 2005b; Arbaugh & Benbunan-Fich, 2007; Arbaugh & Hornik, 2006; Bocchi, Eastman, & Swift, 2004; Drago, Peltier, & Sorensen, 2002; Drago et al., 2005; Eom, Wen, & Ashill, 2006; Peltier et al., 2007](#)) and delivery medium satisfaction ([Arbaugh, 2000a, 2002, 2005b; Eom et al., 2006](#)). In fact, results from some studies suggest that learner–instructor interaction may be the primary variable for predicting online course learning outcomes ([Arbaugh & Rau, 2007; Connolly, Jones, & Jones, 2007; Drago et al., 2002; Marks, Sibley, & Arbaugh, 2005](#)).

Studies that have examined learner–learner interaction in online management education generally have found that it positively predicts course learning outcomes ([Arbaugh, 2002; Arbaugh & Rau, 2007; Peltier et al., 2003; Williams et al., 2006](#)). However, whether learner–learner interaction is a stronger predictor than learner–instructor interaction is unclear because studies that have examined both have produced mixed results. Some studies have found that learner–learner interaction is the stronger predictor ([Arbaugh, 2002; Peltier et al., 2003](#)), and others have found that learner–instructor interaction is the stronger predictor ([Arbaugh & Rau, 2007; Marks et al., 2005](#)). Regardless of which is the direct predictor, it is clear that even in settings where learner–learner interaction is the stronger predictor, instructors still play at least a structural role through the manner in which they design and organize the course, and their role as content expert should not be underestimated ([Arbaugh & Hwang, 2006; Drago et al., 2002](#)). Therefore, findings in the area of participant interaction to date strongly suggest the importance of instructors in online business education.

The fact that most professors who teach online at AACSB International-accredited business schools are self-trained suggests that instructors have been a relatively under-studied participant in online and blended business education ([Perreault, Waldman, Alexander, & Zhao, 2002](#)). This self-training underscores findings of recent research suggesting that perceived usefulness is a stronger predictor of business school faculty acceptance of online education than is perceived ease of use of the technology ([Gibson, Harris, & Colaric, 2008](#)). However, the relatively limited number of studies of instructors tends to underscore their importance. [Arbaugh \(2001\)](#) found that an instructor's use of immediacy behaviors, actions to reduce social distance between the instructor and students, was a stronger predictor of student learning than were student demographics, course design, or attitudes toward the course management system. The absence of such behaviors has been noted as a concern in other studies ([Liu, Bonk, Magjuka, Lee, & Su, 2005; Liu et al., 2007](#)). Such concerns have prompted some scholars to call for increased use of intelligent agents in online courses to manage routine instructional tasks, freeing instructors to focus on aspects of teaching that require more creativity and individual attention ([Li, 2007](#)).

4.8.3. Influences of technology

Although much of the literature in online management education has lacked a common theoretical framework, this is not the case in the area of user perceptions of the electronic communication systems. Several multi-disciplinary studies have used the TAM as a grounding framework, either in its original form ([Davis, 1989](#)) or in the extended

model (Venkatesh & Davis, 2000). This research suggests that although it may have limited predictive power for novice online learners or early course management systems (Arbaugh, 2000c; Arbaugh & Duray, 2002), the TAM has emerged as a useful framework for explaining course management system usage and satisfaction with the Internet as an educational delivery medium (Landry, Griffeth, & Hartman, 2006; Stoel & Lee, 2003). Davis and Wong (2007) found that perceived usefulness and ease of use had moderate effects on student intentions to use the CECIL system at the University of Auckland, but that student perceptions of flow and playfulness of the system (which, in turn, was highly influenced by the speed of the software) were stronger predictors of intentions to use. In studies of relatively experienced online learners, Arbaugh (2004, 2005b) found that perceived usefulness and ease of use of Blackboard increased dramatically between the first and subsequent online course experiences, and that these variables significantly predicted student satisfaction with the Internet as an educational delivery medium. However, because studies examining a possible TAM–learning relationship have yet to find significant results, the TAM has been less useful for predicting learning outcomes (Arbaugh, 2000c, 2005b).

4.8.4. Disciplinary effects and online learning outcomes

A logical direction for studies that draw samples from courses in multiple disciplines is the examination of the impact of disciplinary effects on online course outcomes, and we are beginning to see such studies in business education. Inarguably the most comprehensive cross-disciplinary study to date, Hornik, Sanders, Li, Moskal and Dziuban (2008) examined data from 13,000 students in 167 courses during 1997–2003. The sample included undergraduate courses in disciplines such as IS, the hard sciences, nursing, social sciences, and the humanities. Hornik and colleagues found that student grades were higher and withdrawals were lower for subjects with high paradigm development, those disciplines for which there is general agreement on key definitions and acceptable methodologies (such as hard sciences, nursing, health services), than for those with low paradigm development (such as social sciences, humanities, IS, political science), and that these differences were particularly evident in advanced level courses. Initial studies of disciplinary effects specific to business courses suggest that they may not have as large an effect on learning outcomes as do instructor experience and behaviors (Arbaugh, 2005a; Drago et al., 2002), but that disciplinary effects may have a strong effect on student satisfaction with online learning. Arbaugh and Rau (2007) recently found that disciplinary effects explained 67% of the variance in student satisfaction with the educational delivery medium in a sample of forty online MBA courses. Initial evidence also suggests that non-quantitative courses may be better received than quantitative courses online, but whether this is due to the delivery medium, the subject matter, or both still is unclear (Anstine & Skidmore, 2005; Arbaugh & Rau, 2007).

4.8.5. Classroom comparison studies

Finally, the comparison studies that are so prominent within the disciplines also have a presence in multi-disciplinary and program-level studies. Sitzmann et al.'s (2006) recent meta-analysis of 96 studies found that web-based instruction was 6% more effective than classroom instruction for teaching declarative knowledge. They found that the two methods essentially were equal for teaching procedural knowledge, and learners generally were satisfied equally with both methods as education delivery mediums. However, because only eight of these studies directly addressed business education, generalizing these conclusions across disciplines may be premature. A recent multi-disciplinary study by Klein, Noe and Wang (2006) compared blended and classroom-based learning environments for student motivation to learn and course grades. They found that blended learners with high learning goal orientation and who saw the environment as enabling instead of a barrier had higher motivation

to learn. Motivation to learn then was associated with course outcomes. They observed that the blended environments gave learners more control, required them to take a more active role in their learning, and facilitated motivation to learn more than did classroom instruction. Other comparative studies have focused on aspects other than learning outcomes. Dacko (2001) compared online and full-time MBA student emphases on skill development. He found that full-time students were more likely to perceive a greater emphasis being placed on oral communication and interpersonal skills, and that online student were more likely to perceive a greater emphasis being placed upon analytical and decision-making skills. Both groups believed that their respective perceived emphases were what the program should be emphasizing. In their comparison of 31 online and 27 classroom-based MBA courses, Drago and Peltier (2004) found that in spite the online courses having on average more than twice the enrollment of the classroom-based courses, class size positively predicted course structure and instructor support for online courses, but that it negatively predicted them in the classroom courses. It was unclear whether these findings could be attributed to differences in instructor practice, differing student populations in the two mediums, or other factors.

5. Observations and future research directions

Our review suggests that the volume of research in online and blended business education has increased dramatically during the past decade. With this increased level of activity, we can begin to identify emerging themes and unaddressed areas where further work is needed. In the paragraphs to follow, we raise several questions based upon our review that warrant further attention from business education scholars.

5.1. Why don't B-school education scholars publish in online education journals?

As Table 3 reflects, there already appears to be an emerging upper cadre of journals for online and blended business education research. With eighteen articles published to date, the *Decision Sciences Journal of Innovative Education* (DSJIE) has become the primary home for such scholars to publish their work. Particularly impressive about this journal's rise is that its first volume was published in 2003. At the other extreme of longevity is the *Journal of Education for Business* (JEB). Currently in its 84th volume, it published the second-most number of articles on online and blended learning during the review period. One of the primary contributing factors to these journals' volume of articles is their cross-disciplinary and multi-disciplinary orientation. Both DSJIE and JEB publish manuscripts from all business disciplines, allowing them to draw from a broader pool of scholars than a journal focused on a single discipline. Nevertheless, the disciplines of management, marketing, accounting, and information systems each had at least one journal that published six or more articles on online and/or blended learning during the review period.

The downside to this concentration in discipline-related journals is that this community of scholars has demonstrated a relative avoidance of journals for which online teaching and learning is the primary focus. Although journals such as the *Journal of Educators Online* (which, although a journal dedicated to online learning, business is one of its primary foci), *The Internet and Higher Education*, and the *British Journal of Educational Technology* rated right behind the cadre of discipline-based journals, work published in the online education journals is conspicuous by its absence. Prominent online learning journals such as the *American Journal of Distance Education*, *Journal of Asynchronous Learning Networks*, *Journal of Distance Education*, *Journal of Computer-Assisted Learning*, *International Review of Research in Open and Distance Learning*, and the *Journal of Online Learning and Teaching* each had two or fewer articles in this review.

Although this helps explain the lack of consideration of business education in the reviews by Bernard et al. (2004) and Tallent-Runnels et al. (2006), it also suggests that business school scholars are ignoring an opportunity to inform the broader online learning research community. Perhaps publishing a review such as this in *The Internet and Higher Education* will serve to help build a bridge between business school researchers and online learning researchers.

5.2. How do disciplines influence what scholars do (and don't do)?

Although the collective volume of research has increased dramatically, the rate of increase is somewhat uneven across disciplines. Scholars from the fields of IS, Management, and Marketing are the most active contributors to the research stream, with decidedly fewer contributions from fields such as Operations/Supply Chain Management, Finance, and Economics. Considering the historical roots of this research stream, it is not surprising that scholars from the IS and Management disciplines are the leading contributors to the literature. The primary reason for the disparity in volume of studies is the relative transferability of research methods of the disciplines to studying educational issues. Disciplines that rely on research methodologies of participant observation, such as experiments, surveys, and qualitative research, can transfer their approaches to studying business education readily, whereas disciplines that rely on the study of archival quantitative information are less able to do so. This explains in part why disciplines such as Finance and Economics were under-represented in our study, and generates puzzlement why Accounting was comparatively well represented in the review. Such a state of affairs suggests that this area would benefit from and could substantially contribute to the emerging stream that examines the impacts of “hard vs. soft” and “pure vs. applied” disciplines on teaching and learning in higher education (Biglan, 1973; Burke & Moore, 2003; Neumann, 2001; Neumann, Parry, & Becher, 2002; Smith, Heindel, & Torres-Ayala, 2008).

5.3. Where are the economists?

Although methodological constraints and cultural and disciplinary prejudices may allow us to excuse Finance scholars for their comparative lack of engagement in this body of literature, the same cannot be said for economists. Considering that we have had peer-reviewed journals devoted to economics education for at least forty years and that the study of economics education has relatively high legitimacy compared to other business disciplines, the small number of studies of online and blended learning in economics is both surprising and disappointing. Beyond the previously discussed lack of transferability of the research questions and methods of their discipline, reasons for this lack of activity are unclear. One such reason may be inferred from the results of the studies reviewed here. Because online courses did not fare as well as classroom-based courses in recent studies, perhaps economics education scholars have concluded that the content of the discipline renders it unamenable to online delivery, at least at the undergraduate level (Coates et al., 2004). Such conclusions would be premature for at least three reasons. First, although some have expressed concerns about whether technical, quantitative content can be taught as effectively online (Smith et al., 2008), the number of studies reviewed in this paper reporting positive outcomes in other quantitative and/or technically-oriented courses at minimum raises questions about whether delivering such content online is inherently problematic. Second, such an orientation doesn't allow for the possibility that factors other than the delivery medium might be influencing these outcomes (Brown & Klein, 2008; Clark, 1994). The authors of the economics education studies reviewed here noted that factors such as course design, student maturity, and even student effort may have influenced their findings. Third, the progression of studies from the other

disciplines suggests that performance differences either diminish or even favor online and blended approaches as they become increasingly prevalent. These factors suggest that questions about whether and how economics should be taught online are far from resolved.

Another reason that increased involvement from economics education scholars in online learning would be welcome is the empirical rigor they would bring to the endeavor. Statistical features such as forecasting student performance based upon demographic characteristics and prior academic performance and controls for endogenous learning choice variables are approaches that are not seen in studies from education scholars in other business disciplines (Anstine & Skidmore, 2005; Brown & Liedholm, 2002; Coates et al., 2004). Therefore, by engaging in the cross-disciplinary collaborative studies called for earlier in this paper, economics education researchers could help raise the collective rigor of this field of study.

5.4. Where are tomorrow's Alavis, Jarvenpaas, and Leidners?

A broader concern across the disciplines is a relative lack of scholars who have demonstrated focused research attention on these phenomena. It is indisputable that the intellectual foundations of online and blended learning research in business education were established by the intensive efforts of Maryam Alavi, Sirkka Jarvenpaa, Dorothy Leidner and their colleagues during the 1990s. However, with the exception of a few scholars affiliated with University of Wisconsin System institutions and their co-authors, it is difficult to identify any scholars who have published more than three articles on the topic during this decade. This lack of focused attention from scholars at best significantly slows advances within a field; at worst it renders a field stagnant. With today's increasing emphasis on the use of technology to deliver education in business schools, there are just too many human and financial resources at stake for this body of research to be based upon the work of dabblers and occasional contributors.

One concern often raised by business school scholars is that research in education is not perceived as valuable by their colleagues, disciplines and institutions. Granted, one reason that Alavi, Jarvenpaa, and Leidner could make their contributions is that they had the benefit of contextual cover at the time of their early studies. Although their studies used educational settings, they were able to position them as being applicable to how people in organizations might use such technology. However, conditions for conducting research in business education are becoming increasingly favorable. AACSB guidelines now explicitly state expectations for business schools to be involved in learning and education research. The rise of highly regarded outlets for learning and education research that are sponsored by discipline-based professional organizations such as *Academy of Management Learning & Education*, *Issues in Accounting Education*, and the *Decision Sciences Journal of Innovative Education* provide outlets of increasing respectability. Finally, there is increasing evidence that contributions to discipline-based business research are somewhat concentrated amongst a small group of researchers and institutions (Podsakoff, MacKenzie, Podsakoff, & Bachrach, 2008). Therefore, with the emergence of changes in accreditation guidelines and well regarded outlets, business scholars with interests in education may find that engaging those interests will be a more efficient and fulfilling use of their considerable talents.

5.5. Can we generate more cross-disciplinary collaboration?

The varying degrees of disciplinary representation uncovered in this review beg for greater cross-disciplinary collaborations in online business education research. In addition to the obvious benefit of helping to forge increased collegiality amongst business school faculty and disciplines, such collaborations would yield other benefits to the research stream. First, cross-disciplinary research would help accelerate research in those disciplines where methods do not readily

transfer to educational research. Not only would this be a benefit, it also likely will become necessary for responding to stakeholders in our educational outcomes. It does program directors no good to see research findings that can be prescribed only for IS, Management, and Marketing when they are considering how to develop well-rounded degree programs. Second, cross-disciplinary collaborations likely would yield a more grounded perspective for examining disciplinary effects. Not only would we be able to say whether disciplines differ, we also would be able to better explain why they differ. Third, such approaches would yield better informed researchers within the respective disciplines. The results of our review suggest that business education researchers could benefit from reviewing the work of researchers from other business disciplines, and that theoretical perspectives from disciplines in addition to those provided by IS scholars would be beneficial to this field of study (Close et al., 2005).

5.6. Can we learn anything new from online/classroom comparison studies?

The stream of comparison study research appears to be alive and well in each of the disciplines. With the possible exception of economics, these studies collectively suggest that at minimum there are no differences in performance outcomes between online and classroom-based courses. Results where students in classroom-based courses reported higher learning outcomes appear to be diminishing as instructors and students become more familiar with online course delivery. The findings suggest that merely comparing performance scores in an online and a classroom-based course will not yield many new insights.

What we do see, however, is the potential to gain new insights regarding process and mix. We are beginning to see studies that examine the entirety of the course experience (Kock et al., 2007; Lapsley et al., 2008) that could yield insights regarding how courses can be conducted most effectively, and whether adjustments in conduct need to or can be made to enhance the learning experience. Along this realm lies the issue of optimal blends of online and classroom-based learning. As blended learning becomes increasingly common (Allen, Seaman, & Garrett, 2007; Picciano & Dziuban, 2007), questions regarding the most beneficial blends by discipline and by topic will become increasingly important (Cao et al., 2008; Webb et al., 2005).

5.7. Can We Test Existing Frameworks?

The review identified several frameworks that have been developed for online business education, but there has been very little testing of these frameworks. Therefore, a readily available opportunity for scholars seeking to enter this field is to take one of these frameworks and design a study that tests it. Although some scholars are beginning to test frameworks developed outside of business education using samples derived from business schools (Arbaugh, 2008a; Heckman & Annabi, 2005), it appears that we already have several frameworks of our own to verify. IS has been the primary contributor of frameworks of effectiveness, but our review also found frameworks from the management, marketing, and accounting disciplines.

5.8. Can we bring more of our disciplines into how we examine online learning?

Although this review identified several frameworks developed within business education, we believe the field would benefit from more intentional attempts to apply theoretical perspectives from its respective disciplines. For example, the TAM appears to be the most common theoretical framework used in studies of online and blended business education. Although perspectives from the educational literature can be used, such as transactional distance (Moore, 1973, 1983) equivalency theory (Simonson et al., 1999), and the community

of inquiry (Garrison, Anderson, & Archer, 2000), are there theoretical frameworks used in business disciplines that also might be instructive for the study of online and blended business education? For example, strategy scholars might consider the applicability of resource-based theory or generic strategies for explaining differences between degree programs (Fornaciari, Forte, & Matthews, 1999). As noted in the discussion of finance, studies have found little success with online learning in upper level finance, economics and statistics courses. Could this be due to the nature of the material in these courses? In addition to deepening the conceptual richness of the field, drawing on discipline-based theory likely would have the additional benefit of attracting more scholars. Although they might be new to the research stream, they would not be new to applying the theory from their discipline (Arbaugh, 2008b).

5.9. How do instructors impact online learning?

Faculty have long been considered to be the “neglected resource” in distance education (Dillon & Walsh, 1992). Although this review indicates the emergence of some faculty interview studies, the lack of consideration of faculty effects generally appears to be the case in online business education research (Alavi & Gallupe, 2003). Additional studies of instructors in online and blended business education environments could provide several benefits. First, such studies could help identify what demographic, dispositional, and behavioral characteristics are particularly desirable for online instructors. Although some business education researchers have designed instruments and approaches to test whether students are prepared adequately to take online courses (Parnell & Carraher, 2003; Schniederjans & Kim, 2005), similar approaches for screening potential online faculty are not forthcoming. Second, such research could help faculty determine whether their pedagogical practices are having the effects they desire, and whether their own perceptions of their teaching are consistent with their students’ perceptions. Third, such studies would provide instructors with evidence as they lobby administrators to make changes in incentives and resource allocations to support online teaching and learning appropriately.

Advances in the study of faculty in online management education would not be difficult to include in future research. A first step could include variables such as instructor age, gender, and prior teaching experience, similar to studies that include these measurements for students. Subsequent research on faculty could build upon interview-based methods by including studies of faculty attitudes, perceptions, and behaviors.

6. Conclusion

Nearly fifteen years ago, Ives and Jarvenpaa (1996) presented a vision of how online technologies would change business education and business school professors. This vision suggested the rise of virtual learning communities where students would take greater responsibility for their own learning and researchers would take greater responsibility for the currency of their research. About the same time, Gilbert (1996) argued that visions like these would come to fruition, albeit at a much slower pace than that argued by the visionaries of the day. Although we have seen some of Ives and Jarvenpaa’s predictions come to pass, to date history appears to support Gilbert’s argument. Although technology has changed the way business schools generate and provide their products, this review suggests that this change is very much a work in progress. Now that the initial ground has been broken for the field, there has never been a better time to become an online learning researcher in business education.

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