Teaching Project Management:
Online versus face-to-face

Qiannong Gu*
Ball State University, Muncie, IN, USA

Kunpeng Li
California State University, Northridge, CA, USA

Sheila Smith
Ball State University, Muncie, IN, USA

Thawatchai Jitpaiboon
Ball State University, Muncie, IN, USA

This study compares student satisfaction in online and face-to-face undergraduate project management classes. Our results show that a well-designed online class could meet students' learning expectations equivalent to a face-to-face class does. Our findings show that some major concerns of the effectiveness of an online course, such as lack of collaboration among students and inefficient interactions between students and the instructor could be addressed by well-designed instructions of the online course. The online project management course is designed by following Chickering's seven principles of good teaching practice in this study.

KEYWORDS: *Project management; online education; higher education; learning effectiveness*

* Corresponding Author. E-mail address: qgu@bsu.edu

I. INTRODUCTION

Project management is an important, practical, and popular course in college curriculum. It is not only a core course in most business schools, but also one of the most popular elective courses across campus due to its general applicability in all careers. A project is a temporary endeavor designed to produce a unique product or service given certain resource constraints. To manage a project successfully requires the development of distinct technical skills and management strategies. A course of project management is designed to introduce project management methodologies that ensure the completion of a coherent project through effectively initiating, planning, executing, controlling, and managing risks of a project. What's more, acquisition of the project management tools, practices, and support factors required for effective teamwork also necessitates extensive education (Oakley *et al.*, 2004). Learning project management prepares college students with managerial insights for future management positions. Even when fresh college graduates first participate in a real

world project, the global vision of the project will help them better fulfill their responsibilities as a project team member (Ramazani and Jergeas, 2015).

Yet, project management education involves many challenges for both students and educators. Many students feel immersed with unfamiliar terminologies, unknown concepts, new software, and project documentation requirements. It is often overwhelming for students to deal with all the followings together: a theoretical discussion of each knowledge area, the overlapping process groups, the inclusion of soft skills, and practical application within a team structure. Students often become inundated by the various aspects of the subject, relegate themselves to passive engagement, and overlook the importance of adopting marketable, transferable skills that could improve their comprehensive understanding of project management. Meanwhile, educators could also get frustrated with the ineffectiveness of project management education as reflected in the professional workplace. Mir and Pinnington (2014) reported that project success in the workplace has not significantly improved, despite the advancement in project management knowledge. Thomas and Mengel (2008) also found that tremendous efforts have been spent on improving the effectiveness of teaching project management, but project failures in practice are still increasing due to complexity, chaos, and uncertainty within projects and project environments.

Our paper aims to provide insights of an effective project management education, by investigating the effectiveness of instruction form (online vs. face-to-face) in teaching project management. Instruction form is one of the four important attributes, i.e. content, structure, instruction form, and audience profile, in project management education (Wirth, 1992). Educators are generally very familiar with and confident in the face-to-face instruction form. However, many may doubt the effectiveness of an online instruction form even though online education has been gaining popularity in higher education. Online learning offers flexibility of location and time, and has become an irreversible trend in higher education. More and more courses that are traditionally offered in classrooms have been redesigned and delivered online. Students have become more inclined to the online instruction form. According to a survey conducted by National Center for Education Statistics in U.S. Department of Education, 8% undergraduate students enrolled in at least one online course during 1999-2000 academic year. Later, 16% undergraduate students took online classes in 2003-2004, then 20% in 2007-2008 and 28.5% in 2014-2015.

Some concerns of student learning satisfaction have risen together with the popularity of online learning. Cole *et al.* (2014) conducted a three-year study of graduate and undergraduate students' satisfaction with online and hybrid instruction. They found that students preferred hybrid courses over online courses with "lack of interaction" cited as the most reason for dissatisfaction. To address the concerns of online learning, this study investigates and compares the effectiveness of both online and face-to-face instruction form in project management education. A project management course requires extensive interaction between students and instructor, and among students. It would give us meaningful insights in terms of classroom collaboration and interaction. We survey undergraduate students in both online and face-to-face project management classes in a large public university. Evaluation of learning effectiveness in terms of students' satisfaction is conducted after students completed the classes. Our results show that a well-designed online class could meet students' expectation of learning at an equivalent level as a face-to-face class does. Our findings suggest some major concerns of the effectiveness of online course, such as lack of collaboration among students, interaction with the instructor etc., may not exist if they can

be carefully addressed during the design phase of an online class. Overall, our research supports the fast-growing expansion of distance learning in higher education. We are confident that students could receive high quality education, regardless the teaching format (online or face-to-face).

The remainder of the paper is organized as follows. The next section reviews the related literature. We discuss online project management course design in Section III. In Section IV, we elaborate the design of survey instruments and research questions in this study. In Section V, we detail our data collection and analysis. Section VI summarizes and concludes the research.

II. LITERATURE REVIEW

In this section, we review the challenges in teaching project management, recent trends of distance learning and potential issues in online education, as well as measurements of online students learning effectiveness and satisfaction.

2.1. Project Management Education

Hyvrari (2006) examined the critical factors and failures in project management. The success factors include clear objectives, commitment to the end user, adequate resources, ability to coordinate, effective leadership, commitment and flexibility with resources, support from the upper management, clear job description, structuring by project, technological and economic environment. Besteiro et al., (2015) conducted an exploratory empirical research on project managers from 28 companies in order to classify critical success factors into four driver groups. They proposed 57 variables altogether with 18 for managerial liabilities group, 19 for critical success factors group, 13 for monitoring and control group, and 7 for lessons learned.

Using evaluative and developmental measures at the individual and team levels, Kemery and Stickney (2014) assessed a multifaceted, multilevel approach for acquiring and assessing teamwork knowledge, skills, and abilities in an undergraduate business course. Teamwork knowledge, individual teamwork behavior, and collaborative peer rating were the three assessments administered. Differences were found between the day and night sections of the course, possibly due to age and work experience. Dutcher *et al.* (2015) compare students' learning experiences in online and face-to-face business law classes. They studied what specific characteristics of students that may affect their satisfaction. We adopt the same survey instrument to examine the teaching effectiveness for online and face-to-face project management courses. Our study aims to examine whether online education is a feasible option for delivering project management course for undergraduate student.

2.2. Online/distance learning

Recently, online/distance learning has been a new trend and kept growing in higher education (Allen and Seaman, 2013). Kim and Bonk (2006) claimed that emerging technology promotes the development of course management systems which, in turn, makes online learning more convenient and attractive to college students. Zhang *et al.* (2004) summarized the advantages of online learning compared to traditional classroom learning. They found that online learning offers location flexibility, provides archival capability for reusing and sharing knowledge, and maybe more student centered. The results of their experiments showed that e-learning can be as effective as traditional in-classroom education.

Online education is not limited to majors, methodologies, or cultures. The advance of technology can always find a way to accommodate the needs of delivering an online course. For example, medical schools also

adopt e-learning system to support their education. Chen *et al.* (2011) reported the results of utilizing online simulator to teach dental school graduates. Zapalska *et al.* (2003) reported the online learning of undergraduate business education. Liaw (2008) evaluated the effectiveness of Blackboard-based online class and found the students' satisfaction was influenced by interactive learning activities and e-learning system quality. Bolliger and Wasilik (2012) focused on the challenges in teaching a quantitative course, introduction to statistics, in which college students normally struggled. This study focuses on online education for a specific topic, project management. Despite the general trend of online courses in higher education, the design of each online course may vary and should be customized based on the contents and the topics. This study also provides a list of tools used to design an online project management course.

2.3. Learning effectiveness

One of the major concerns on online education is the quality of education in terms of the effectiveness of learning, which can be measured by students' satisfaction and performance. McFarland and Hamilton (2006) found that an online course could be the same as a traditional course in terms of students' performance and satisfaction. They also explored the factors that affect student performance and satisfaction in both online and traditional management information systems (MIS) classes. They found that there are no differences on students' performance and satisfaction between online class and traditional class. However, the factors affecting students' performance and satisfaction differed between two classes. Therefore, they argued that the design of online course materials significantly influence the effectiveness of online learning. However, in some cases, the students' performance are the same but the students felt more satisfied with traditional course

(Kleinman and Entin, 2002; Piccoli *et al.,* 2002; and Priluck, 2004). Therefore, this study focuses on the students' satisfaction because more factors affect the students' feeling on online course even they might learn as much as they can in a traditional course. This self-perception issue will affect the enrollment and the further development of online courses and online programs.

Jackson *et al.* (2010) found that timeliness and accessibility of instructor, clearly stated expectations, instructor enthusiasm, and comfortable climate positively influenced student satisfaction. More specifically, Chen *et al.* (2011) found that learner interface, learning community, content, and personalization are four fundamental factors affecting dentistry students' satisfaction while an online simulator is utilized. Grady (2013) emphasized that student-faculty interactions are extremely important to improve students' satisfaction in a large-scale, compressed timeline online course. Although Cole *et al.* (2014) did find statistical difference between online and traditional classes in terms of students' satisfaction, they found that "lack of interaction" is the most cited drawback of online class and "convenience" is the most cited advantage in students' reports. Rabe-Hemp *et al.* (2009) analyzed student engagement, learning, and satisfaction. They found that learning mechanism drove the learning and teaching styles. Therefore, they argued that instructors and students need to change the ways of teaching and learning when moving from a face-to-face learning environment to an online setting. It is also worth to mention that a unique study examines students' satisfaction in an online doctoral program (Bolliger and Halupa, 2012). Doctoral education is significantly different from undergraduate education as it focused more on research. Bolliger and Halupa (2012) found negative correlation between student anxiety and learning satisfaction. They conclude a carefully designed online course will lead to higher

student satisfaction regardless the levels of education or the areas.

III.   ONLINE COURSE DESIGN

We first would like to clarify the definition of online course in this study. There are two basic formats of online course. The first one is that a course has materials delivered online and instructors teach students through live videoconference. It is also referred to as distance learning. The second format is that there is no synchronized online lecture. Students study at their own pace by accessing to online course materials, schedules and assignments. The online class in this study has the latter format with pre-videotaped lectures and weekly assignments available on Blackboard to help students learn the materials.

Technology development has made online learning convenient and attractive to students in many ways, such as location flexibility, working at a pace that is the best for the individual, easy access to course material, etc. However, many educators are concerned about the effectiveness of online course, such as lack of collaboration among students, lack of interaction with the instructor, passive learning with minimal class participation, time management and self-motivation issues for the students, and delays in responding student questions, etc. Many researchers have proposed effective design principles for online course to ensure the quality of online education to be equivalent to traditional in-classroom teaching. Various educators have adopted Chickering's seven principles of good practice in the design of online courses (Chickering and Gamson, 1987; Simonson et al., 1999; Hathaway, 2014). Many research findings have proved that these principles can be implemented effectively for online courses to address challenges of online learning (Niederhuaser *et al.*, 1999; Young, 2006).

Chickering's seven principles are: 1) Encourage contact between students and faculty; 2) Develop a reciprocity and cooperation among students; 3) Encourage active learning; 4) Give prompt feedback; 5) Emphasize time on tracks; 6) Communicate high expectations; 7) Respect diverse talents and ways of learning. Principles One and Two address interaction issues in online learning. Principle Three addresses concerns of passive learning with minimal class participation. Principle Four emphasizes the importance of timely feedback. Principle Five focuses time management issues. Principles Six and Seven promote student's self-motivation in online learning. We follow the Chickering's seven principles of good practice to design the online project management course in this study. Our goal is to give online students the same or better learning experience and satisfaction comparing to the traditional classroom-learning environment. Detailed online course components that are corresponding to Chickering's principles can be found in Table 1. Details of survey questions are listed in Tables 2 and 3.

IV.   SURVEY DESIGN AND RESEARCH QUESTIONS

First, we design two groups of survey questions, one group focuses on project management concepts learning experience, and the other emphasizes learning experience of the knowledge applications in student's major/career. The second group of questions is especially important due to the practical and applicable nature of project management. They also address the feedback of project management educational ineffectiveness from the work place. Second, we design survey questions based on the four important attributes in project management education, i.e. content, structure, instruction form, and audience profile, as proposed in Wirth (1992).

For project management concepts learning experience, we adopt survey instrument proposed in Dutcher *et al.* (2015)

and develop six questions listed in Table 2. Question 1 covers the content of the course; question 2 is a direct feedback about the instruction form (online or face-to-face) of the course; questions 3, 4, and 5 concern about the structure of the course; and question 6 indirectly reflects the instruction form. We expect there would be less direct personal interactions among students in the online class, but more social media interactions. We are curious about the overall impact of student interactions on the learning experience between online and face-to-face students. We also design audience profile questions, regarding student's gender, age, social background, and working experience. However, the differences of audience profile are not significant enough between the online and face-to-face classes in this particular study. We therefore omit those questions and data in this report.

TABLE 1. ONLINE PROJECT MANAGEMENT COURSE DESIGN.

	Chickering's principles of good teaching practice	Online course design	Corresponding survey items
1	Encourage contact between students and faculty	Online discussion forum, email, phone calls	Q5, Q7
2	Develop a reciprocity and cooperation among students	Discussion forum set up in course management systems (blackboard), email	Q3, Q6, Q11, Q12
3	Encourage active learning	Mandatory discussion participation required; multiple attempts allowed for online quizzes	Q2, Q4, Q7,
4	Give prompt feedback	Most questions/emails are responded with a couple hours including weekends, no more than 24 hours	Q2, Q9,
5	Emphasize time on tacks	Deadlines are highlighted on Blackboard in red and bold, Email reminder sent to students 24 hours before deadlines	Q5, Q8,
6	Communicate high expectations	Detail feedback to each assignment and exam, Rubrics are used for writing assignments	Q1, Q6, Q9,
7	Respect diverse talents and ways of learning	Bonus points for additional contribution, e.g. constructive suggestions, and excellent assignments, etc.	Q1, Q3, Q10

TABLE 2. SURVEY QUESTIONS REGARDING CONCEPT LEARNING.

Q1	I am satisfied with the amount of project management concepts I have learned in this course.
Q2	I believe the course format (online or face-to-face) positively affected my ability to learn project management concepts.
Q3	The number of students in this section positively affected my ability to learn project management concepts in this course.
Q4	The class meeting time positively affected my ability to learn project management concepts in the course.
Q5	Class discussion in this course positively affected my ability to learn project management concepts in this course.
Q6	Interaction with my classmates during the semester positively affected my ability to learn project management concepts in this course.

TABLE 3. SURVEY QUESTIONS REGARDING APPLYING PM KNOWLEDGE.

Q7	I am satisfied with the skills of applying project management in my major/career I learned in this course.
Q8	I believe the course format (online or face-to-face) positively affected my ability to learn applying project management in my major/career.
Q9	The number of students in this section positively affected my ability to learn applying project management in my major/career.
Q10	The class meeting time positively affected my ability to learn applying project management in my major/career.
Q11	Class discussion in this course positively affected my ability to learn applying project management in my major/career.
Q12	Interaction with my classmates during the semester positively affected my ability to learn applying project management in my major/career.

The first research question in this study investigates the learning efficiency of project management concept from the students' perspective. Course delivery format (online or face-to-face) affects the learning efficiency, but the results reported are mixed in the literature (Johnson et al., 2000; Arbaugh and Duray, 2002; Shelly et al., 2008; and Finlay et al., 2009).

Research question 1 (**R1**): Does student satisfaction with their learning efficiency of project management concepts differ between online and face-to-face classes?

The second research question examines the learning efficiency of applying project management knowledge learned in class, which requires student interaction and communication for group discussion and collaboration. Interactions among students and between students and the instructor are essential in project management class. We develop other six survey questions regarding student learning on applying project management knowledge and include them in Table 3.

Research question 2 (**R2**): Does student satisfaction with their learning efficiency of applying project management knowledge differ between online and face-to-face classes?

V. DATA COLLECTION AND ANALYSIS

We survey fifty-six (56) students in two face-to-face project management classes and thirty-four (34) students in an online class during the same semester. There are more female students (24) than male students (10) in online class. However, there are 36 male students in face-to-face class comparing to 20 female students. All of them are junior or senior students. Most of students are between 21 and 24 years old. All classes are taught by the same instructor and using the same teaching materials, such as textbook, supplement reading materials, etc. Students' feedbacks regarding their

satisfaction on learning experience utilize a 7-point Likert scale with one representing "strongly disagree" and seven representing "strongly agree". We first analyze the data from the two face-to-face classes to see whether there is response bias between the two classes. We then compare the responses between online and face-to-face classes to investigate the effectiveness of online education.

5.1. Test for Response Bias between Face-to-face Classes

We first conduct a test for response bias between two face-to-face project management classes. The purpose of this test is to ensure the consistence between two face-to-face classes, and to test the validity of combining data from the two face-to-face classes together. Table 4 presents the mean and ANOVA results for each survey question. The results show there is no significant difference between the survey responses of the two face-to-face classes. As a result, we can combine the two face-to-face classes' data together, and compare them to responses from the online class. Please note that "F2F" in the tables is the abbreviation for "face-to-face", and "OL" is "online".

Although there are no significant differences reported in Table 4, it is still worth to mention two items with low p values, i.e. questions 1 and 4. The low p value of question 1 indicates that the students in the second class have slightly higher satisfaction on learning project management concepts than those in the first class. The two face-to-face classes are taught in exactly the same way, but at different times of the day. There are 45 students registered in each class. Students volunteered to participate in an anonymous learning satisfaction survey. The response rate is 75% in the first class and 50% in the second one. It is possible that a higher ratio of more active and positive students participated in the survey in the second class because, generally speaking, positive students are more actively involved in

class activities. Therefore, a higher ratio of participation from more active and positive students may cause the difference of learning satisfaction between the two classes.

5.2. Comparison between online and face-to-face classes

We compare the survey responses between the online and face-to-face classes and present the results in Table 5. The ANOVA analysis is utilized to investigate the significance of the differences of learning

effectiveness between the online and face-to-face classes. The results show that, for items 1, 2, 5, 7, 8 and 11, the online students' satisfactions are significantly higher than those of face-to-face classes. The student satisfactions for the rest of the survey items are similar (not significantly different) between the two instruction forms. In summary, our results indicate that a well-designed online class could efficiently satisfy the students' learning expectations equivalent to traditional face-to-face class does.

TABLE 4. LEARNING EFFECTIVENESS COMPARISON BETWEEN F2F CLASSES.

Survey item	Mean		ANOVA	
	F2F-1 (34)	F2F-2 (22)	F	p
Q1	5.294	5.773	3.377	0.072
Q2	5.471	5.500	0.006	0.939
Q3	4.491	5.000	0.023	0.880
Q4	5.529	5.045	1.808	0.184
Q5	5.265	5.273	0.000	0.984
Q6	5.176	4.909	0.347	0.558
Q7	5.441	5.636	0.364	0.549
Q8	5.382	5.500	0.098	0.755
Q9	4.971	5.136	0.243	0.624
Q10	5.219	5.182	0.016	0.899
Q11	5.316	5.136	0.250	0.619
Q12	5.400	5.182	0.315	0.577

TABLE 5. LEARNING SATISFACTION COMPARISON BETWEEN ONLINE AND F2F CLASSES.

Survey item	Mean		ANOVA	
	F2F (56)	OL (34)	F	p
Q1	5.483	6.147	12.033	0.001
Q2	5.500	6.118	5.256	0.024
Q3	4.966	4.882	0.069	0.793
Q4	5.362	5.324	0.016	0.898
Q5	5.190	5.765	3.645	0.059
Q6	5.086	4.853	0.467	0.496
Q7	5.483	6.324	13.926	0.000
Q8	5.431	6.176	8.173	0.005
Q9	5.034	4.853	0.383	0.538
Q10	5.197	5.265	0.068	0.795
Q11	5.203	5.676	2.880	0.093
Q12	5.303	5.294	0.001	0.976

One of the concerns of online class is the interaction and collaboration among students. Items 3, 4, 6, 9, 10, and 12 have shown that there is no significant difference between the face-to-face and online classes regarding student interaction and collaboration. Furthermore, items 1 and 2 indicate a higher level of students' satisfaction of the online class. From the instructor's observation, online students are more self-motivated as expected. Therefore, the students in online class are more willing to study and aware of the potential inconvenience related to an online teaching format. With the availability of all communication means and devices, the interactions among online students have not been an issue at all. Meanwhile, the advantages of a face-to-face class in terms of the opportunity of interaction have been greatly discounted due to the advancement of communication technology. Items 5 and 11 represent this trend. As to items 7 and 8, it is beyond the scope of the classroom (including online learning environment) for students to apply the knowledge learned in class to business practices. In summary, the online project management students are more satisfied with the learning environment than in face-to-face classes in some measurements, and feel similarly (no significant difference) towards the rest of measurements. Overall, we conclude that a well-designed online project management class could satisfy students equivalent to a face-to-face class.

VI. CONCLUSION

In this study, we explore the differences regarding students' learning satisfaction between online and face-to-face project management classes. We strategically design online project management course following Chickering's seven principles of good teaching practice. We study the student satisfaction in online and face-to-face classes that offered in the same semester and taught by the same instructor. Our results show that students in online class are more satisfied in terms of some

measurements comparing to the students in face-to-face class, and feel similarly towards the rest of the metrics.

The findings in this study first confirm the results and expectations in the literature regarding online education in a specific subject, project management. A list of activities following Chickering's seven principles of good teaching practice is provided for designing online project management course. This study clarifies concerns of inefficiency of online education in project management that requires more collaboration and interaction among students and between students and the instructor. Our findings suggest that online learning is an equivalently effective form of education comparing to a traditional face-to-face teaching of project management.

REFERENCES

Allen, I.E. and Seaman, J. *Changing course: Ten years of tracking online education in the United States*, Babson Park, MA: Babson Survey Research Group, 2013.

Arbaugh, J.B., Duray, R. "Class Section Size, Perceived Classroom Characteristics, Instructor Experience, and Student Learning and Satisfaction with Web-Based Courses: A Study and Comparison of Two On-line MBA Programs'", *Academy of Management Proceedings & Membership Directory,* 2001, A1-A6.

Besteiro, E.N., de Souza Pinto, J., and Novaski, O., "Success factors in project management", *Business Management Dynamics,* 4(9), 2015, 19-34.

Bolliger, U.D. and Halupa, C., "Student perceptions of satisfaction and anxiety in an online doctoral program", *Distance Education*, 33(1), 2012, 81-98.

Bolliger, U.D. and Wasilik, O., "Student satisfaction in large undergraduate online courses", *The Quarterly Review of Distance Education*, 13(3), 2012, 153-165.

Chen, M., Su, Z., Wu, T., Shieh, T., and Chiang, C., "Influence of dentistry students' e-learning satisfaction: a questionnaire survey", *Journal of Medical Systems*, 35, 2011, 1595-1603.

Chickering, A.W. and Gamson, Z.F., "Seven principles for good practice in undergraduate education", *AAHE Bulletin,* 39(7), 1987, 3-6.

Cole, T.M., Shelley, J.D., and Swartz, B.L., "Online instruction, e-learning and student satisfaction: a three year study", *The International Review of Research in Open and Distance Learning*, 15(6), 2014, 111-131.

Dutcher, W.C., Epps, K.K., and Cleaveland, M.C., "Comparing business law in online and face to face formats: a difference in student learning perception", *Academy of Educational Leadership Journal*, 19(1), 2015, 123-134.

Finlay, W., Desmet, C., and Evans, L., "Is It the Technology or the Teacher? A Comparison of Online and Traditional English Composition Classes", *Journal of Educational Computing Research*, 31(2), 2004, 163-180.

Grady, R. J., "Improving student satisfaction with large-scale, compressed timeline online courses", *The Quarterly Review of Distance Education*, 14(4), 2013, 195-208.

Hathaway, K., "An application of the seven principles of good practice to online courses", *Research in Higher Education Journal*, 22, 2014, 1-12.

Hyväri. I., "Success of projects in different organizational conditions", *Project Management Journal, International* project management standard ISO21500. Australian Committee MB12. 2006.

Jackson, C.L., Jones, J.S., and Rodriguez, C.R. "Faculty actions that result in student satisfaction in online courses", *Journal of Asynchronous Learning Networks,* 14(4), 2010, 78-96.

Johnston, J., Killion, J., and Oomen, J., "Student Satisfaction in the Virtual Classroom", *the Internet Journal of Allied Health Sciences and Practice*, 3(2), 2005, 1-7.

Kemery, E.R. and Stickney, L.T.A, "Multifaceted approach to teamwork assessment in an undergraduate business program", *Journal of Management Education,* 38(3), 2014, 462-479.

Kim, K. and Bonk, J.C., "The future of online teaching and learning in higher education", *Educause Quarterly*, 4, 2006, 22-30.

Kleinman, J. and Entin, E., "Comparison of in-class and distance-learning students' performance and attitudes in an introductory computer science course", *Journal of Computing Sciences in Colleges*, 17(6), 2002, 206-219.

Larson, E. and Drexler, J.A., "Project management in real time: A service-learning project", *Journal of Management Education,* 34(4), 2010, 551-573.

Liam, S., "Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: a case study of the Blackboard system", Computers and Education, 51, 2008, 864-873.

McFarland, D. and Hamilton, D., "Factors affecting student performance and satisfaction: online versus traditional course delivery", *Journal of Computer Information Systems*, winter, 2006, 25-32.

Mir, F. and Pinnington, A., "Exploring the value of project management: Linking project management performance and project success", *International Journal of Project Management,* 32(2), 2014, 202-217.

Niederhauser, V.P., Bigley, M., Hale, J., and Harper, D., "Cybercases: an innovation in internet education", *Journal of Nursing Education*, 38(6), 1999, 1-4.

Oakley, B., Felder, M.R., Brent, R., and Elhajj, I., "Turning student groups into effective teams", *Journal of Student Centered learning*, 2(1), 2004, 9-34.

Piccoli, G., Ahmad, R., and Ives, B., "Web-based virtual learning environments: a research framework and a preliminary assessment of effectiveness in basic IT skills training", *MIS Quarterly*, 25(4), 2001, 401-426.

Priluck, R., "Web-assisted courses for business education: an examination of two sections of principles of marketing", *Journal of Marketing Education*, 26(2), 2004, 161-173.

Rabe-Hemp, C., Woollen, S., and Humison, G.S., "A comparative analysis of student engagement, learning, and satisfaction in lecture hall and online learning settings", *The Quarterly Review of Distance Education*, 10(2), 2009, 207-218.

Radford, A.W. *Stats in brief: Learning at a distance: Undergraduate enrollment in distance education courses and degree programs*. Washington DC: national center for education statistics, 2011.

Ramazani, J. and Jergeas, G. "Project managers and the journey from good to great: the benefits of investment in project management training and education", *International Journal of Project Management*, 33, 2015, 41-52.

Shelley, D.J., Schwartz, L.B., and Cole, M.T., "Learning Business Law Online v. Onland; A Mixed Method Analysis", *International Journal of Information and Communication Technology Education*, 4(2), 2008, 54-66.

Simonson, M., Schosser, C., and Hanson, D., "Theory and distance education: a new discussion", *The American Journal of Distance Education*, 13(1), 1999, 60-75.

Thomas, J. and Mengel, T., "Preparing project managers to deal with complexity – advanced project management education", *International Journal of Project Management*, 26, 2008, 304-315.

Wirth, I., "Project management education: current issues and future trends", *International Journal of Project Management*, 10(1), 1992, 49-54.

Young, S., "Student view of effective online teaching in higher education", *The American Journal of Distance Education*, 20(2), 2006, 65-77.

Zapalska, A., Shao, D., and Shao, L., "Student learning via WebCT course instruction in undergraduate-based business education", *Teaching online in higher education (online) conference,* 2013.

Zhang, D., Zhao, J., Zhou, L., and Nunamaker, J., "Can e-learning replace classroom learning?", *Communications of the ACM*, 47(5), 2004, 75-79.