Eight Principles of Effective Online Teaching: A Decade-Long Lessons Learned in Project Management Education

By John Cable and Clara Cheung

Abstract

How can we develop high-quality online courses? How can we know whether our online teaching is effective? How can we improve our online teaching skills? To ask those questions, this paper presents a practical framework that helps practitioners systematically evaluate online teaching. In addition, based on the framework, we discuss our lessons learned for a decade of teaching a graduate-level project management course online. The discussion could help practitioners develop new ideas to enhance their online teaching practices, and thus empowers them to design and deliver more effective online courses in the future.

Keywords: higher education, online learning, online teaching, seven principles for good practice in undergraduate education, learning assessment

1. Introduction

With the rapid growth in the number of online courses offered by universities and massive open online programs (MOOCs), there is a considerable interest in the quality of online instruction (e.g., Chapman & Henderson, 2010; Means et al., 2009; Yang & Cornelious, 2005). Although the literature has shown online instruction is as effective as face-to-face instruction, the finding was based on high quality online courses that were well-planned and well-implemented (Campbell et al., 2008; Means et al., 2009; Sitzmann et al., 2006). So, how can we know whether our online teaching is effective? How can we improve our teaching practices if we are not yet there?

Drawing on the "Seven Principles for Good Practice in Undergraduate Education" (Chickering & Gamson, 1987), and our experiences of teaching a graduate-level project management course online in the past decade, this paper presents a practical framework to evaluate online teaching, and lessons learned for online instruction that correspond to the framework. The Seven Principles have been widely used as a framework to evaluate teaching quality in higher

education since 1987 (McCabe & Meuter, 2011). Although the framework was originally designed for evaluating face-to-face instruction, it has emerged as an accepted rubric for evaluating effective online instruction in recent years (Graham et al., 2001; Tirrell & Quick, 2012). While to a great extent good teaching is good teaching, teaching online is different from teaching in a classroom in the sense that online instruction requires more effective integration of technologies and learning. To include this unique aspect of online teaching, we extended the seven principles framework by adding a principle about learning technology applications, and named the extended framework Eight Principles of Effective Online Teaching.

Specifically, in this paper, we will first explain the eight principles used in the framework, followed by illustrating how we used it to evaluate our online teaching, and discussing what related best practices were identified based on our decade-long online teaching experience.

2. Literature Review: Eight Principles of Effective Online Teaching Framework

The first seven principles in the framework are from Chickering and Gamson's Seven Principles for Good Practice in Undergraduate Education (1987). We added the eighth principle, technology application, in the framework as we considered it is a unique aspect of online education. The following part outlines each of the principles.

Figure 1 summarizes the eight principles framework

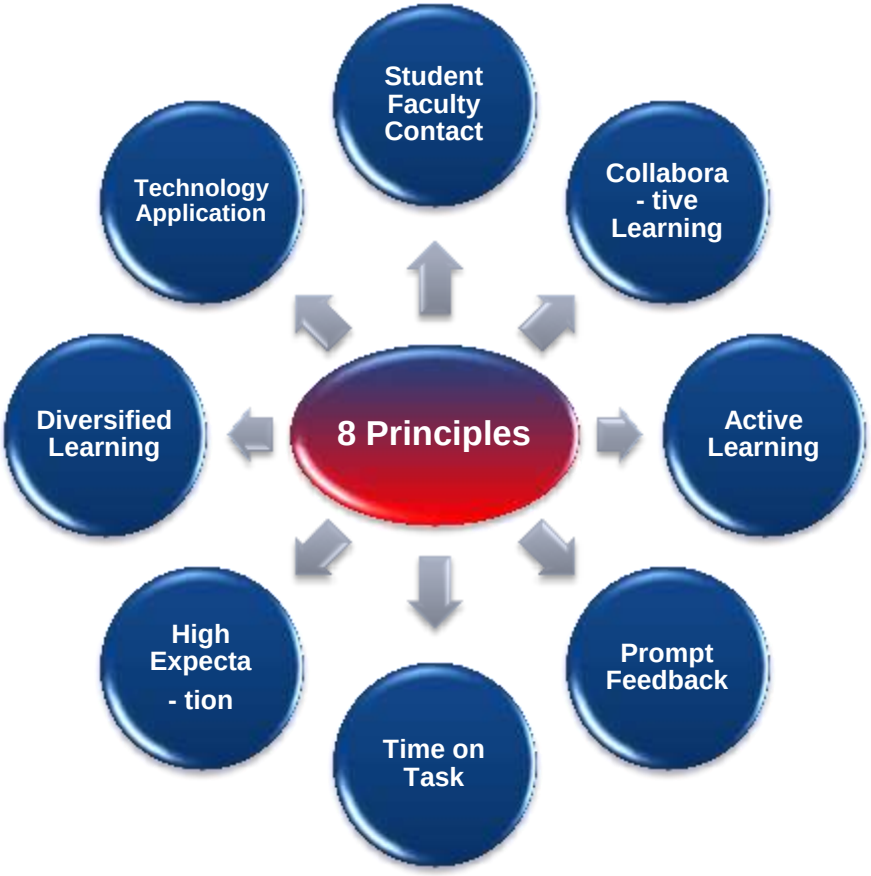

Figure 1: Eight Principles of Effective Online Teaching Framework

Principle 1: Encourage Student-Faculty Contact

In general, educators found that the more frequent and meaningful interactions between the faculty and students, the greater the student engagement and satisfaction (e.g., Astin, 1993; Kuh & Hu, 2001; Umbach & Wawrzynski, 2005). Through interacting with students, faculty can get to know what course content students are struggling with, and then provide necessary guidance to help them get through rough times. As a result, students are more likely to stay motivated toward their learning and achieve better learning outcomes (Robinson & Hullinger, 2008).

Principle 2: Encourage collaborative learning

Collaborative learning is a type of learner and learner interaction (So & Brush, 2008). In a collaborative learning environment, learners share knowledge among one another as they work towards achieving common learning outcomes. In other words, learners play an active role in knowledge acquisition, and knowledge is collaboratively created and shared among learners in collaborative learning processes (Brindley et al., 2009). For example, learners participate in

group discussions, search for information, and share opinions with their peers. Therefore, through shared goals, shared explorations, and a shared process of meaning-making, collaborative learning was found to help students develop higher order thinking skills and achieve deeper knowledge generation (Brookfield, 1995; Jonassen et al.; Palloff & Pratt, 2004).

Principle 3: Encourage active learning

Active learning is a process of making students engage in activities that have them reflect upon what they learned and how they are applying their learning (Michael, 2006). By using active learning, students take the lead in their own learning. They regard their teachers as a partner to guide them through the learning process and motivate them for further endeavors (Petress, 2008). For example, to practice active learning, students can talk about what they are learning, write about it, relate it to past experiences, and apply it to their daily lives. As a result, students must make what they learned as part of themselves. More important, research suggested that active learning can lead to greater retention of knowledge, a stronger motivation to learn, deeper understanding, and more positive attitudes on the subject being taught (Bell & Kozlowski, 2008).

Principle 4: Give Prompt Feedback

The provision of timely feedback on students' performance is considered essential to student learning (Biggs, 2011; Gibbs et al., 2005; Weaver, 2006). In fact, Chickering and Gamson (1987) concluded that prompt feedback is important to students' learning outcomes because it enables students to evaluate existing knowledge, reflect on what they have learned and what they still have to learn, and receive recommendations for improving their future work. As a result, students are able to make adjustments to improve their learning performance, and achieve learning objectives.

Principle 5: Emphasize time on task

"Time plus energy equals learning" Chickering and Gamson (1987, p.4). More specifically, students need to spend sufficient time on studying in order to achieve satisfactory academic performance (Nonis & Hudson, 2006). To help students allocate a realistic amount of time on completing various learning tasks, educators have to define clear time expectations for them, which lays the foundation for high performance.

Principle 6: Set and communicate high expectations

Teacher expectation research in the past 40 years has provided clear evidence that when teachers expected their students to perform at high levels, they did (Rubie-Davies, 2010). In other words, higher expectations help generate higher student performance. This phenomenon is known as the self-fulfilling prophecy effect. Self-fulfilling prophecy refers to the situation when an initially erroneous belief leads to its fulfillment (Rubie-Davies et al., 2006). For example, in a classic study by Brophy and Good (1970), they found that teachers who set high standards of performance tend to interact with students in ways that enable them to fulfill their high expectations. Some ways that high expectation teachers use to stimulate students' learning could include setting clear grading rubrics, giving frequent feedback, and praising positive learning behaviors and outcomes.

Principle 7: Respect diverse talents and ways of learning

Today's education requires teachers to educate students with different cultural backgrounds, learning abilities, learning styles and many other characteristics (Gollnick & Chinn, 2013). To meet this challenge, teachers must not only respect diverse talents in principle, but also introduce various teaching methods to cater to students' learning needs and strengths. In fact, studies showed different teaching methods generate various knowledge retention rates. In particular, the National Training Laboratories provided a learning pyramid (see figure 2) that showed that lecturing at the top of the pyramid has the lowest retention rate while teaching others, at the bottom of the pyramid, has the highest retention rate. Although people have questioned the creditability of the retention rate used in the pyramid, the pyramid does indicate the importance of using different teaching methods for delivering the best student learning outcomes (Lalley & Miller, 2007).

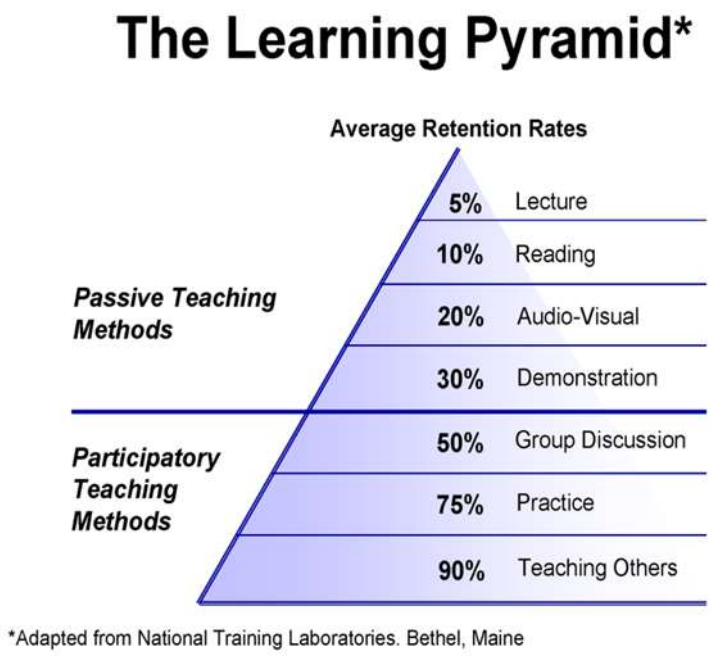

Figure 2: The Learning Pyramid

Principle 8: Technology application

Technology application is an essential element in online education as online students need to learn and interact with instructors and their peers by using various online technologies. Yet, communication and information technology alone cannot lead to student success. Instead, educators must use technology as a lever to promote student engagement (Ehrmann, 2004). In other words, we need to choose the right technology to enhance student learning process and experience.

3. Challenges and Lessons Learned

Lessons for principle 1: Encourages student-faculty contact

Rather than physically interacting with students in a traditional class, teaching online courses requires us to interact with students in a virtual environment. Most commonly, we need to spend time responding to their emails and discussion board postings, one the one hand. On the other hand, we are afraid that if we did not respond to students quickly, they would feel lost and ignored. Therefore, it could be quite challenging to strike a balance between enhancing our presence in a virtual setting and not being overwhelmed with all emails and discussion board postings. To address this, we found the following practices are effective:

- Set a clear standard for the response time to email inquiries and discussion board postings. For example, in our syllabus, we stated that "We will make every effort to respond to emails within 24 hours of receiving it."
- Create short videos to introduce ourselves to students, teach students how to navigate in the learning management system for finding corresponding learning materials and assignments, and give feedback on assignments (please refer to the "Lessons for principle 4" for more details).
- Introduce synchronized learning by doing weekly video conferences with students. In our course, students are required to attend one of the video conference sessions each week. There are about 10 to 15 students in each session. In each session, we use an hour to first address general concerns from students, followed by discussing the vital concepts of the lecture videos, and going over students' key learning of the week. We have also found that the students in the weekly video conferences feel as though they have "spent an hour with the professor" even though they have shared that time with other students.

Lessons for principle 2: Encourages collaborative learning

We know collaborative learning occurs when small groups of students interact and help one another to learn. Therefore, strongly encourage forming study groups for weekly discussions and review of the weeks concepts and we also divided the class into small project teams at the beginning of our course, and required each team to deliver two projects together. Providing such interactive learning opportunities in an online course seems to be a sound idea, but we did encounter challenges, as online students are often in different locations and time zones. These barriers could hinder students from working effectively together, resulting in frustration and even resentment. To better support collaborative learning in a virtual environment, we found the following practices are useful:

- Communicate to students why group work is necessary. For example, we shared with our students how the projects align with the learning objectives, and how they will benefit from it.
- Provide students with the information of digital platforms and tools that support online collaboration such as Google Docs, Google Hangouts, Zoom and Skype.
- Provide clear guidelines for group assignments that outline student expectations, grading rubrics, and procedures to deal with absent group members.
- Provide support to address non-contributing group members and group challenges.

- Implement an evaluation mechanism on two levels – group and individual.

Lessons for principle 3: Encourages active learning

Active learning takes place when students are involved in doing things and thinking about the thing on which they are working (Bonwell & Eison, 1991). Based on our experience, we found that the components of good active learning activities are more or less the same in both traditional and online environments. In general, good active learning activities should 1) have defined starting and ending times; 2) have a clear purpose or objective; 3) include precise directions and assessment methods; 4) incorporate a feedback mechanism; and 5) contain information about the technology or tool being implemented in the exercise (Mantyla, 1999). Examples of activities that we used to encourage active learning in our course are:

- Pearl diving exercise: a weekly base reflective writing exercise that required students to express their own views on what they learned from the course materials, and link them with possible applications to their current jobs.
- Project presentation: students were required to present their group projects to other students in a virtual environment. This exercise aims to make students practice the communication skills they learned in class.

Lessons for principle 4: Give prompt feedback

Like many aspects of teaching, the issue with feedback is not we don't know the importance of giving prompt feedback. Rather, it is that we don't have time to provide the kind of feedback that we would like and deliver in a timely manner for online students. According to the U.S. News in 2013, the average class size of an online bachelor program in the US is one teacher and 150 students. As a result, it could be quite daunting to fulfill the needs of giving prompt feedback to each student. Although our course has not yet grown into such a size, it seems to be a trend to have a large class size in online education, as enrollments are no longer limited by the size of a physical classroom. Under the circumstances, we always look at ways to enhance our efficacy of giving quality feedback. The following strategies are what we found useful:

- Use rubrics to grade our assignments and give feedback accordingly. A rubric breaks down the assigned work into a set of criteria that reflect the weighted importance of the objectives of the assignment. It helps to make sure our grading standards don't change over time. Equally important, a well-designed rubric can reduce the time that we spend

on grading as it allows us to refer to the rubric description associated with a score rather than having to write long comments on it.

- Embrace emergent technologies for giving feedback. For example, using speech recognition software to convert our voice to text when we give feedback to students help improve efficiency, especially when writing lengthy feedback.
- Give group feedback for summative assessments by using short videos. Summative assessments include quizzes and exams. We often get tremendous emails inquiries about giving feedback on exam questions. Instead of responding to students' emails one by one, we found it is more effective to give group feedback using a short video. In the video, we highlighted the common mistakes students made in their quizzes or exams, and explained why their answers were incorrect.

Lessons for principle 5: Emphasize time on task

As most of our students are working professionals, they all have very busy schedules. To enable them to allocate enough time for learning the course materials, we found it is effective to use the following practices:

- Explicitly tell students how much time we expect them to put into learning the course materials at the beginning of our course. To achieve this purpose, figure 3 is the diagram we used to explain our expectations in our first lecture video.
- Break down the learning journey into several manageable milestones and make them in sequence. For example, we require students to first finish the reading assignments, following by doing reading quizzes, watching lecture videos, attending video conferences, and completing homework assignments (see figure 3). The due dates of these milestones were spread throughout the week to enable students to achieve the targets progressively.
- Set up due date alerts for students in our learning management system, Canvas. As a result, students got reminder emails for the assignments' due dates.

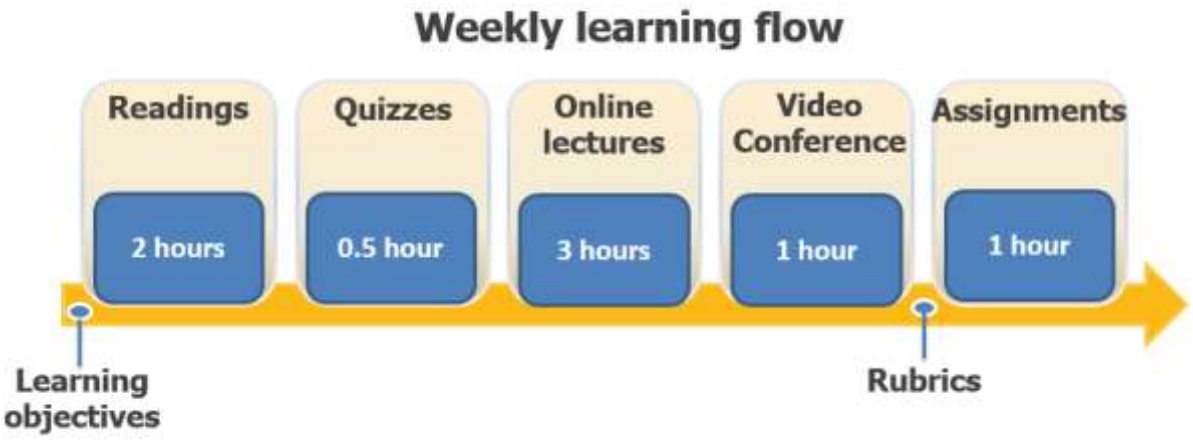

Figure 3: Required time of learning milestones

Lessons for principle 6: Set and communicate high expectations

According to McKeachie & Svinicki (2005), when students know what the teacher expects of them, they can be more productive. To raise expectations and improve the quality of work in our course, we implemented the following practices:

- Make sure students understand the content of the syllabus by using a syllabus quiz and introducing it in our first lecture video. Our syllabus actually serves as a "what you need to know" document that includes weekly learning objectives, policies about late work, grading and feedback, and the dangers of plagiarism. We also have a separate section that details due dates and submission of assignments. Therefore, by making students understand the details of the syllabus, they should have an idea on what our expectations are.
- Use rubrics to show students our expectations on each assignment. To ensure they understand the content of rubrics, we also explained them in our weekly video conferences.
- Provide student exemplars. In addition to rubrics, we provide students with an example of a well-done assignment. As we have taught the course for years, we share actual student examples (with names removed) as exemplars.

Lessons for principle 7: Respect diverse talents and ways of learning

As our course is always taken by students who have very diversified educational backgrounds and work experiences, we designed the course in a way that involves varieties of teaching methods so as to cater to different students' learning needs and strengths. To do so, we used the

learning pyramid below to map out our learning activities as shown in figure 4. The following is the detailed explanation:

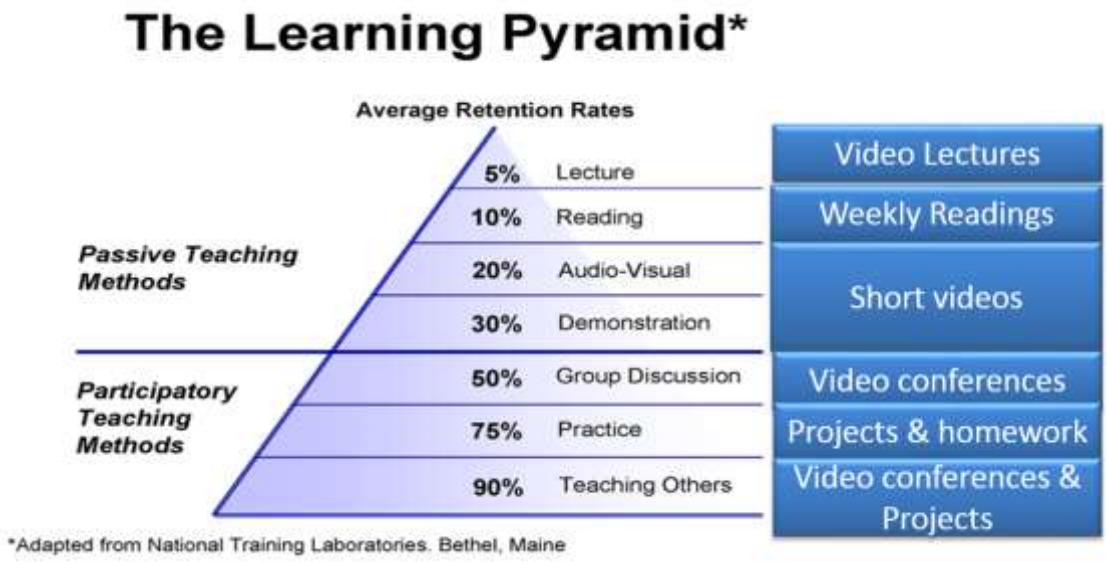

Figure 4. Learning activities with the learning pyramid

- Video lectures are a series of online videos that cover the course content.
- Weekly readings include textbook and other supplementary materials posted on the learning management system, Canvas.
- Short videos are used to give feedback or show how to solve a specific homework problem.
- Video conferences: Each week, students are required to discuss the key concepts of the week with other students. We give them a participation grade depending on how much they contribute to the discussion including the element of teaching others.
- Projects & homework both focus on helping the student apply what they learn in the course. Case studies and mathematic problem-solving exercises are typically used.

Lessons for principle 8: Technology application

As technology has rapidly developed to enhance students' learning experiences, we, as educators, need to continually explore new learning tools and find strategies to implement them for improving online instruction. Yet, there are literally thousands of technology applications for supporting online teaching; thus, we could be overwhelmed with the information and suggestions we get from other teachers, students and/or Google searches. Under the circumstances, we found it is critical to take a step backward by asking ourselves two

fundamental questions: 1) Which areas of the course do we want to improve? 2) Why do we want to improve them? Moreover, we need to be realistic and not try to change everything overnight. Only picking up one or two new technology applications to work out in each semester did bring us the best return-on-investment.

4. Conclusions

The eight principles provide and effective framework to use to evaluate if you are doing the things you can to improve communication and create an effective learning environment. Courses that include readings, short quizzes, lectures and other short concept videos, video conferences, and weekly reflective essays and case studies create an opportunity for students with different learning styles and preferences to utilize many different techniques to enhance their comprehension of the material.

5. References

Astin, A. W., & others. (1993). *What matters in college?: Four critical years revisited* (Vol. 1). Jossey-Bass San Francisco. Retrieved from https://www.researchgate.net/profile/Alexander_Astin/publication/242362064_What_Matters_in_College_Four_Critical_Years_Revisited/links/00b7d52d094be57582000000.pdf

Bell, B. S., & Kozlowski, S. W. J. (2008). Active learning: Effects of core training design elements on self-regulatory processes, learning, and adaptability. *Journal of Applied Psychology*, *93*(2), 296–316. http://doi.org/10.1037/0021-9010.93.2.296

Biggs, J. B. (2011). *Teaching for quality learning at university: What the student does*. McGraw-Hill Education (UK). Retrieved from https://books-google-com.proxy-um.researchport.umd.edu/books?hl=en&lr=&id=VC1FBgAAQBAJ&oi=fnd&pg=PP1&dq=Teaching+for+quality+learning+at+university:+what+the+student+does.&ots=E6BNpD7zKn&sig=1o1UWf3OOnOlqpa96YIvudrhiZo

Bonwell, C. C., & Eison, J. A. (1991). *Active Learning: Creating Excitement in the Classroom. 1991 ASHE-ERIC Higher Education Reports.* ERIC. Retrieved from http://eric.ed.gov/?id=ED336049

Brindley, J., Blaschke, L. M., & Walti, C. (2009). Creating effective collaborative learning groups in an online environment. *The International Review of Research in Open and Distributed Learning*, *10*(3). Retrieved from http://www.irrodl.org.proxy-um.researchport.umd.edu/index.php/irrodl/article/viewArticle/675

Brookfield, S. D. (1995). *Becoming a Critically Reflective Teacher* (1st edition). San Francisco: Jossey-Bass.

Campbell, M., Gibson, W., Hall, A., Richards, D., & Callery, P. (2008). Online vs. face-to-face discussion in a

web-based research methods course for postgraduate nursing students: A quasi-experimental study. *International Journal of Nursing Studies*, *45*(5), 750–759. http://doi.org/10.1016/j.ijnurstu.2006.12.011

Chapman, B. F., & Henderson, R. G. (2010). E-Learning Quality Assurance: A Perspective of Business Teacher Educators and Distance Learning Coordinators. *Delta Pi Epsilon Journal*, *52*(1), 16–31.

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

Gibbs, G., Simpson, C., Gravestock, P., & Hills, M. (2005). Conditions under which assessment supports students' learning. Retrieved from http://eprints.glos.ac.uk/3005/

Gollnick, D. M., & Chinn, P. C. (2013). *Multicultural education in a pluralistic society*. Pearson Higher Ed.

Graham, C., Cagiltay, K., Lim, B., Craner, J., & Duffy, T. M. (2001). Seven principles of effective teaching: A practical lens for evaluating online courses. *The Technology Source*, *30*(5), 50.

Jonassen, D., Davidson, M., Collins, M., Campbell, J., & Haag, B. B. (1995). Constructivism and computer-mediated communication in distance education. *American Journal of Distance Education*, *9*(2), 7–26.

Kuh, G. D., & Hu, S. (2001). The Effects of Student-Faculty Interaction In the 1990s. *The Review of Higher Education*, *24*(3), 309–332. http://doi.org/10.1353/rhe.2001.0005

Lalley, J. P., & Miller, R. H. (2007). The Learning Pyramid: Does It Point Teachers in the Right Direction? *Education*, *128*(1), 64–79.

Mantyla, K. (1999). *Interactive Distance Learning Exercises that Really Work!: Turn Classroom Exercises Into Effective and Enjoyable Distance Learning Activities*. American Society for Training and Development. Retrieved from https://books.google.com/books?hl=en&lr=&id=kIUy0m5B-44C&oi=fnd&pg=PR5&dq=Interactive+distance+learning+exercises+the+really+work!&ots=5c-9JDpa8d&sig=DAT5g2SdpwjuScDICZ4FETwAw8E

McCabe, D. B., & Meuter, M. L. (2011). A Student View of Technology in the Classroom Does It Enhance the Seven Principles of Good Practice in Undergraduate Education? *Journal of Marketing Education*, *33*(2), 149–159.

McKeachie, W., & Svinicki, M. (2005). *McKeachie's Teaching Tips: Strategies, Research, and Theory for College and University Teachers* (12th edition). Boston: Wadsworth Publishing.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies. *US Department of Education*. Retrieved from http://eric.ed.gov/?id=ED505824

Michael, J. (2006). Where's the evidence that active learning works? *Advances in Physiology Education*, *30*(4), 159–167.

Nonis, S. A., & Hudson, G. I. (2006). Academic Performance of College Students: Influence of Time Spent Studying and Working. *Journal of Education for Business*, *81*(3), 151–159.

http://doi.org/10.3200/JOEB.81.3.151-159

Palloff, R. M., & Pratt, K. (2004). *Collaborating Online: Learning Together in Community* (1 edition). San Francisco: Jossey-Bass.

Petress, K. (2008). What Is Meant by "Active Learning?" *Education*, *128*(4), 566–569.

Robinson, C. C., & Hullinger, H. (2008). New Benchmarks in Higher Education: Student Engagement in Online Learning. *Journal of Education for Business*, *84*(2), 101–109.

Rubie-Davies, C., Hattie, J., & Hamilton, R. (2006). Expecting the best for students: Teacher expectations and academic outcomes. *British Journal of Educational Psychology*, *76*(3), 429–444. http://doi.org/10.1348/000709905X53589

Rubie-Davies, C. M. (2010). Teacher expectations and perceptions of student attributes: Is there a relationship? *British Journal of Educational Psychology*, *80*(1), 121–135. http://doi.org/10.1348/000709909X466334

Sitzmann, T., Kraiger, K., Stewart, D., & Wisher, R. (2006). The comparative effectiveness of web-based and classroom instruction: A meta-analysis. *Personnel Psychology*, *59*(3), 623–664.

So, H.-J., & Brush, T. A. (2008). Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. *Computers & Education*, *51*(1), 318–336.

Tirrell, T., & Quick, D. (2012). Chickering's Seven Principles of Good Practice: Student Attrition in Community College Online Courses. *Community College Journal of Research and Practice*, *36*(8), 580–590. http://doi.org/10.1080/10668920903054907

Umbach, P. D., & Wawrzynski, M. R. (2005). Faculty do matter: The role of college faculty in student learning and engagement. *Research in Higher Education*, *46*(2), 153–184.

Weaver, M. R. (2006). Do students value feedback? Student perceptions of tutors' written responses. *Assessment & Evaluation in Higher Education*, *31*(3), 379–394. http://doi.org/10.1080/02602930500353061

Yang, Y., & Cornelious, L. F. (2005). Preparing Instructors for Quality Online Instruction. *Online Journal of Distance Learning Administration*, *8*(1). Retrieved from http://www.westga.edu.proxy-um.researchport.umd.edu/~distance/ojdla/spring81/yang81.htm

About the Authors

John Cable

Director, Project Management Center for Excellence
University of Maryland, College Park, MD, USA

John Cable is Director of the Project Management Center for Excellence in the A.J. Clark School of Engineering at the University of Maryland, where he is also a professor and teacher of several graduate courses in project management. His program at the University of Maryland offers masters and PhD level programs focused on project management. With more than 1,300 seats filled annually with students from many countries, including more than 40 PhD students, the program is the largest graduate program in project management at a major university in the United States.

John Cable served in the newly formed U.S. Department of Energy in 1980, where he developed energy standards for buildings, methods for measuring energy consumption, and managing primary research in energy conservation. As an architect and builder, Mr. Cable founded and led John Cable Associates in 1984, a design build firm. In 1999 he was recruited by the University of Maryland's Department of Civil & Environmental Engineering to create and manage a graduate program in project management. In his role as founder and director of the Project Management Center for Excellence at Maryland, the program has grown to offer an undergraduate minor, master's degrees, and a doctoral program. Information about the Project Management Center for Project Management at the University of Maryland can be found at www.pm.umd.edu.

In 2002, PMI formed the Global Accreditation Center for Project Management Educational Programs (GAC). Mr. Cable served as Vice Chair and Chair from 2002 through 2012, leading the accreditation of 86 PM educational programs at 40 institutions in 15 countries. John was awarded PMI's 2012 Distinguished Contribution Award for his leadership at the GAC. He can be contacted at jcable@umd.edu.

Clara Cheung

Manchester, UK

Clara Cheung is a Lecturer (Assistant Professor) in Project Management in the School of Mechanical, Aerospace and Civil Engineering at the University of Manchester in the United Kingdom. Prior to that, she worked at the University of Maryland (UMD) in the United States as a Teaching Assistance for six years, developing and teaching a wide variety of project management courses for both undergraduate and postgraduate students, and both on campus and online. Through the experience, she taught and tutored over 600 students from 22 countries, many of whom are experienced engineers. Clara received two Distinguished Teacher Awards from the UMD for her service. Her research interests are in human aspects of project management and the use of technology to improve student learning outcomes. She also obtained a Postgraduate Certificate from the UMD's University Teaching and Learning Program, and a Specialization Certificate from the University of California's Virtual Teacher Program. She can be contacted at clara.cheung@manchester.ac.uk.