

Online versus Flipped Learning: Understanding Factors that Shape Student Success in an ERP Fundamentals Course

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Abstract

The purpose of this study is to explain factors that contribute to successful learning outcomes in ERP courses delivered via online and flipped learning formats. The authors conducted a study that collected data from four introductory ERP courses in a single semester: three courses delivered via a “flipped” learning mode and one course delivered fully online. Students who consented to participate in the study were surveyed at two points in the semester to assess perceptions concerning technology and learning, individual traits, and learning styles. Student grades were used to measure student performance. Results indicate that the online students performed more poorly on average as compared to the flipped students, but they still had a significantly stronger preference for online courses and intentions to enroll in future online courses. The learning preferences of students aligned with the course delivery format in which they were enrolled, suggesting that these learning preferences may be particularly salient to students when choosing a course delivery format. Understanding the factors that lead to successful learning across different technology-enabled course delivery systems will lead to improvements in pedagogy that impact effective student learning.

Keywords: Pedagogy, Learning, Performance, ERP, Simulation, Online, Flipped

Introduction

In the past couple of decades, rapid technological advances have allowed educators to employ an increasing number of tools for technology-mediated learning. Two major course delivery methods that have gained traction in higher education are flipped learning and online learning (Bishop and Verleger 2013; Yukselturk and Bulut 2007). Flipping, or inverting, a classroom has been defined as “events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa” (Lage et al. 2000, p. 32). Generally, asynchronous Web-based content in the forms of online video lectures or electronic reading materials and assessments are assigned to students to complete outside of scheduled class time, and the face-to-face class session is reserved for hands-on applications and extensions of the course content (Bishop and Verleger 2013). Online learning represents the delivery of courses in a fully online format and, in the United States (U.S.), the percentage of fully online programs continues to increase in higher education;

online business programs alone were estimated to be offered at 33% of colleges and universities in 2008 (Allen and Seaman 2008).

Current research suggests that both online and flipped learning yield similar learning outcomes and student attitudes as compared to traditional face-to-face (FTF) learning (Day and Foley 2006; Redpath 2010). Much of the previous research has pointed to the importance of student self-regulation (Yukselturk and Bulut 2007) and learning styles (Dağ and Geçer 2009) as key predictors of learning success in technology-mediated learning environments.

However, there is little research that compares learning outcomes and preferences between online and flipped delivery methods. Furthermore, despite the growing number of studies showing no statistical difference in instructional quality between technology-mediated learning and FTF learning, there is a persistent bias held among stakeholders in the higher education community that views technology-mediated learning as *inferior* to traditional FTF learning (Redpath 2010). As a result, there have been recent calls to more deeply probe success factors in technology-mediated instruction, particularly in the management discipline (Arbaugh et al. 2013).

To address this call, the authors conducted a pilot study comparing student traits, perceptions, and learning outcomes across students enrolled in fully online and flipped classes for an Enterprise Resource Planning (ERP) Fundamentals course. This extended abstract presents preliminary results from this study.

Methodology

The authors collected data from four introductory ERP classes in a single semester: three classes delivered via a “flipped” learning mode and one class delivered fully online. In the study, the four classes employed standardized Blackboard content and design and offered the same assigned readings, lecture video content (created by all three authors), and assessments. The four classes were taught separately by the first two authors. In the flipped learning classes, a nearly-identical Blackboard course was presented to students, with the exception that the students were expected to consume the online lecture content outside of class time and perform the hands-on activities and major assessments in the face-to-face class session, where the instructor was present to guide and instruct on these activities. Students who consented to participate in the study were surveyed at two points in the semester to assess perceptions concerning technology and learning as well as to capture various individual traits. Performance data was captured via student grades.

Results and Discussion

Because there was only one fully online course delivered during the semester of data collection, the study resulted in completed surveys from 22 students in the online course and 57 students across the three sections of the FTF (flipped) course. Between the two groups, there were no significant differences in various demographic factors, so mean values for these factors are presented for the total 79 students. The mean student age was 23, with a range from 19 to 40 years old. Males represented 68% (54/79) of the students, and females represented 32% (25/79) of the students. The majority of students, over 70%, indicated that they were single with no dependents. Only 14% of the students reported full-time jobs, with the majority of the students being either part-time employed or unemployed. Students reported an average of 12 years of experience using computers and/or laptops. In the first data collection point, students indicated their prior ERP experience on a 7-point Likert scale (1=“None” to 7=“A Great Deal”) and reported an average score of 3 (“A Little”) for their ERP experience.

Independent t-tests show significant differences between the online students and flipped classroom students with respect to some of the factors studied. Notably, the key performance indicator—student overall grades (an average of two exams and four SAP lab assignments)—was different between the two groups, with the online students performing more poorly (mean grade=79.3) than the flipped classroom students (mean grade= 85) ($p < .01$). The remaining factors presented were measured using a 7-point Likert scale from 1=“Strongly Disagree” to 7=“Strongly Agree.” In terms of differences in learning preferences, compared to the online students, more students in the flipped classes reported that they learn well from their peers ($p < .01$, mean=5.24 vs. mean=4.19) and prefer to work with others ($p < .01$, mean=5.06 vs. mean=3.94). In contrast, at $p < .10$ significance, compared to flipped students, online students reported a preference to learn on their own rather than from their peers (mean=4.94, mean=4.20). Compared to

flipped students, online students also found the online lecture videos to be more useful to their learning in the class ($p < .05$, mean=5.38 vs. mean=4.27).

Further, despite online students' performing more poorly on average as compared to the flipped classroom students, online students indicated a strong intention to enroll in online courses in the future ($p < .01$, mean=5.5 vs. mean=3.86). There were no significant differences in satisfaction levels of students in either course format at both points of data collection. Thus, a likely explanation for this difference is that students enroll in online courses because the online format meets their needs in dimensions unrelated to learning outcomes (but still salient to them) as compared to the FTF learning environment. For example, the online students in this study suggested that they experience many more social barriers as compared to the flipped students, such as being less adept at making new friends ($p < .01$, mean=4.88 vs. mean=6.08) and at expressing themselves through speech ($p < .01$, mean=4.10 vs. mean=5.16).

Predictors of successful performance across both learning modes included higher levels of technology self-efficacy and personal innovativeness.

Conclusion and Implications

Because the study is limited in its sample size, particularly with the online student group, the findings presented are merely preliminary. Future research should continue to explore success factors across different technology-mediated learning formats and focus on strategies to enhance learning effectiveness in various modalities of instructional delivery (Redpath 2010). The results of this study indicate that certain students may have a strong preference for online course delivery regardless of less optimal learning and performance outcomes. Thus, future research should explore more nuanced determinants of learning success in technology-mediated learning environments.

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