



On-campus students taking online courses: Factors associated with unsuccessful course completion



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ABSTRACT

On-campus students are requesting online course options, and campuses are increasingly providing online sections of core courses, with a common offering involving online science lectures accompanied by on-campus lab courses. However, low course completion rates by on-campus students in online courses have become an area of concern. This study seeks to identify factors associated with unsuccessful online course completion and withdrawal by investigating course completion rates in an online physics lecture course. The authors use eight years of data ($N = 3032$) to establish lecture course completion patterns then compare these patterns with three semesters ($N = 940$) of a hybrid course combining online lecture with face-to-face laboratories. Deviations from established patterns are identified and student characteristics which are uniquely associated with unsuccessful course completion and withdrawal in online sections are isolated. Differences in rates of students repeating the class, lower rates of repeating student completion in online sections, and early disengagement by repeating students are found to be important. Results imply the need for early course interventions and/or potential policies regarding repeating students.

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1. Introduction

The demand for online course offerings has steadily increased with almost 5.3 million university students taking at least one online course in 2013–14. In conjunction with increased enrollment, over 70% of academic leaders indicate online learning is critical to their institution (Allen & Seaman, 2015), and view online course offerings as a potential solution to issues associated with a lack of classroom space, increased educational costs, and student demand for flexible learning options (Hart, Friedman, & Hill, 2015).

Increases in online activity are not without challenges and controversy. Xu and Jaggars (2011a) reference the ongoing debate between researchers, practitioners, and policymakers concerning the effectiveness and promise of online learning. This debate has traditionally focused on higher withdrawal rates and lower successful completion rates by off-campus students in online programs (Carr, 2000), and much of the research has focused on non-traditional and/or graduate level students (Rovai, 2003). However, as larger universities increase

online core course offerings to on-campus students, the online attrition problem has come to the forefront as a potential on-campus issue. Administrators recognize that as more students in traditional undergraduate academic programs choose to enroll in a mix of face-to-face (f2f) and online courses, higher withdrawal and non-completion rates in online courses could have the potential to negatively impact retention and graduation rates for on-campus students (Jenkins, 2012).

To support this concern, recent research with undergraduate students demonstrates that successful course completion is lower in online class sections than in traditional f2f courses (Hart et al., 2015; Xu & Jaggars, 2011a). Similarly, subject-specific undergraduate course research indicates withdrawal and completion rate differences between f2f and online course sections are even more pronounced in lower-level Science, Technology, Engineering, and Mathematics (STEM) courses (Wladis, Hachey, & Conway, 2013). Findings such as these have led some to suggest freshmen are ill-prepared for online courses (Urtel, 2008), gated advisement is necessary in undergraduate online courses (Clay, Rowland & Packard, 2008), and undergraduate students should avoid lower-level online science and math courses (Smith, Heindel, & Torres-Ayala, 2008).

While these studies are important and can inform policies and practices, much of the research to date concerning undergraduate online courses has not involved lower-level STEM courses, and those that have focused in this area have primarily occurred at small institutions

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(Atchley, Wingenbach, & Ackers, 2013), within the community college setting (Wladis, Conway, & Hachey, 2015a; Xu & Jaggars, 2011b), or with students who are primarily at a distance as opposed to on-campus (Boston, Ice, & Gibson, 2011; Finnegan, Morris, & Lee, 2008). Additional research is needed to fully understand the withdrawal and completion patterns of the growing number of on-campus undergraduate students at larger universities who elect to take lower-level STEM courses online as part of their overall academic program.

This study seeks to fill this gap by using ten years of data to establish lecture course completion and withdrawal patterns within a lower-level science lecture course at a large research university. These data are then compared to data from recent online sections of the same science lecture course in an attempt to identify deviations from expected patterns, and to isolate on-campus student characteristics uniquely associated with course completion and withdrawal in the online sections.

2. Literature review

Researchers have demonstrated that the consequences of course withdrawals or failures are costly to both the student and the institution (Simpson, 2005; Wischusen, Wischusen, & Pomarico, 2011). Hart et al. (2015) have extended this understanding to assert that the benefits derived from the offering of online courses may not be enough to offset the costs associated with course non-completion or failure. As large institutions increase offerings of online core undergraduate courses to on-campus students, it is important to consider the potential costs of such actions by revisiting research findings related to online course completion patterns, particularly in lower-level STEM courses which have been shown to have the highest levels of non-completion and withdrawal rates (Atchley, Wingenbach, & Akers, 2013; Wladis et al., 2013). Similarly, it is important to reexamine existing research concerning student characteristics traditionally associated with non-completion and withdrawal of distance students within online courses, as these characteristics may prove relevant to understanding completion and withdrawal rates of on-campus students who choose to mix online and f2f courses as part of their academic programs.

2.1. Online completion and withdrawal rates

Although meta-analyses have indicated online environments are as instructionally effective as the traditional classroom (Means, Toyama, Murphy, Bakia, & Jones, 2009; Wu, 2015), if students are not completing online courses, instructional effectiveness cannot be adequately determined and any positive benefit of instruction is overcome by the negative impact of non-completion. There is a general consensus that withdrawal rates in online courses are higher than in f2f courses (Atchley et al., 2013; Boston et al., 2011; Diaz & Cartnal, 2006; Hart et al., 2015; Levy, 2007; Murphy & Kenner, 2016; Newbury, 2013; Rovai, 2003; Tello, 2007), with researchers reporting 10–40% higher dropout rates in online courses than in f2f classrooms (Borcoman, 2004; Carr, 2000; Dziuban, Hartman, & Moskal, 2004; McLaren, 2004; Paden, 2006; Patterson & McFadden, 2009).

These dramatic findings have brought withdrawal rates to the forefront of the conversation concerning online course effectiveness, and have led scholars such as Lee and Choi (2011) to assert that withdrawal rates in online courses must be scrutinized and addressed. To further emphasize this point Jenkins (2012) states, “Unfortunately, we seem to have forgotten that access and completion are not the same thing. Simply getting more students to enroll isn’t going to help much if too few of them ever finish” (para. 9).

Coinciding with the need to reduce withdrawal rates is the desire to increase the rate of successful (grade = A, B, C) versus unsuccessful (grade = D/F) online course completion. Similar to withdrawal rates, researchers report that successful course completion is lower in online class sections than in traditional f2f courses (Hart et al., 2015; Urtel, 2008; Wladis, Hachey, & Conway, 2014a), with some researchers

simultaneously investigating both completion and withdrawal rates. As an example, in two extensive studies, Xu & Jaggars concurrently examined course completion and withdrawal rates of nearly 24,000 Virginia and over 50,000 Washington state community-college students. Both studies reported significantly higher instances of course withdrawal for students in online courses, with course completion rates in online course sections 8–14% lower than in face-to-face counterparts (Xu & Jaggars, 2011a, 2011b). As the aforementioned studies indicate, withdrawal and completion rates are historically lower in online versus f2f courses overall.

2.2. Completion and withdrawal rates in online STEM courses

In addition to lower overall withdrawal and completion rates, Patterson and McFadden (2009) suggest that these rates may also be disproportionately impacted based upon discipline. Researchers investigating specific subject areas have found that academic field of study does play a role in online completion and withdrawal rates, with science and math courses more negatively impacted than other disciplines (Atchley et al., 2013; Carnevale, 2003; Paden, 2006; Smith et al., 2008; Wladis et al., 2014a; Wladis et al., 2013). More specifically, subject-specific results indicate that both withdrawal and completion rate differences are more pronounced in lower level STEM courses (Hachey, Wladis, & Conway, 2015), which has led some scholars to suggest that lower-level STEM courses such as lab science and math courses may not be appropriate for online delivery (Carnevale, 2003; Nelson, 2006; Paden, 2006; Smith et al., 2008). Other researchers disagree that lower-level STEM courses are inappropriate online course subjects. Rather, they assert that these courses are less successful because of characteristics associated with the students who take these courses, not because of the course subject matter (Wladis, Conway, & Hachey, 2015a, 2015b; Wladis et al., 2014a).

2.3. Student characteristics associated with completion and withdrawal

Meyer, Bruwelheide and Poulin (2009) have suggested that, “Given such variation in experience with retention rates, it remains important to ask what keeps online students enrolled” (pg. 130). Researchers have answered this call to action by exploring a variety of student characteristics potentially associated with online completion and withdrawal. Findings suggest that various student demographics such as age, gender, rank, and academic readiness impact online course completion (Aragon & Johnson, 2008; Hare, 2013; Hart et al., 2015; McLaren, 2004; Twigg, 2009; Urtel, 2008). As a specific example, Wladis et al., (2015a) found that women had higher rates of completion in f2f as compared to online STEM courses, and within the online STEM courses older students had significantly higher completion rates than younger counterparts.

Contrary to the aforementioned studies, Lee and Choi (2011) performed a thorough review of empirical studies related to student withdrawal in online courses from 1999 to 2009, and they report that demographic characteristics such as age and gender do not significantly contribute to low course completion rates. Rather, they suggest that student factors such as academic background, skills, and relevant online experiences are strongly related to the successful completion of online courses. More specifically, they assert that students with a history of poor academic performance, low technology skills, and no online course experience are more likely to enroll in online courses, but are much less likely to successfully complete them.

Supporting the assertion that prior experiences are important, Hachey, Wladis, and Conway (2015) demonstrate that students who have successfully completed a previous online course have a significantly higher chance of successfully completing an online STEM course than those who have either withdrawn from or unsuccessfully completed a prior online course. Similarly, research from Poellhuber, Chomienne and Karsenti (2008) finds that students with a history of poor academic

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