

COMPARISON OF EQUATED LEARNING FOR ONLINE AND ON-CAMPUS POSTGRADUATE STUDENTS ON ACADEMIC ACHIEVEMENT

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Abstract

This study assesses the effects of study mode on student achievement in two modes of study. The two modes of study are on-campus learning and online learning. The University of the West of Scotland has been offering flexible postgraduate programmes in Alcohol and Drugs Studies online since 1999 and uses Blackboard, the Virtual Learning Environment (VLE), to support equated learning. The explicit focus of this continuing longitudinal study (dating originally from 2002) is on student achievement. In this continuing evaluation comparing on-campus and online student grade performance, online study groups have exactly the same module syllabus as their on-campus counterparts. There is equivalence of support in that students on both modes of study are taught on the same traditional 15-week trimesters as students on the on-campus version, have the same learning materials, live interactive lectures using the VLE as a central hub, and the same assessment methods including assignments, projects, and class tests. Most importantly, the online and on-campus modes of study had the same learning outcomes, the same academic module moderator and also the same external examiner to ensure that assessed work by students on each mode of study was marked to the same standard. Statistical analysis of academic outcomes revealed no significant differences in grades (summative marks) between online and on-campus groups. This finding indicates that students are not disadvantaged by selecting to study via online learning and that equated learning is indeed occurring in practice.

Comparing Online and On-campus Learning

Within the higher education sector, online learning has now been transformed from a minor type of education to a commonly accepted and increasingly popular alternative to traditional face-to-face on-campus learning (Gunawardena & McIsaac, 2004). Distance education, or distance learning, is a field of education that focuses on the pedagogy, technology, and instructional system designs that aim to deliver education to students who are not physically on site in a traditional classroom or campus. It has been described as “a process to create and provide access to learning when the source of information and the learners are separated by time and distance, or both” (Honeyman & Miller, 1993). In other words, distance learning is the process of creating an educational experience of

equal quality for the learner to best suit their needs outside the classroom. Distance education courses that require a physical on-site presence for any reason (including taking examinations) is considered a hybrid or blended course of study. This emerging technology is becoming widely used in universities and institutions around the globe¹ with the recent trend advances in personal computing, and financial uncertainty, distance learning is becoming more recognised for its potential in providing a cheaper alternative to traditional on campus education.

A systematic review of the research literature from 1996 through July 2008 by Means, Toyama, Murphy, Bakia, and Jones (2009) identified more than a thousand empirical studies of online learning. Analysts screened these studies to find those that (a) contrasted an online to a face-to-face condition, (b) measured student learning outcomes, (c) used a rigorous research design, and (d) provided adequate information to calculate an effect size. As a result of this screening, 51 independent effects were identified that could be subjected to meta-analysis. “The meta-analysis found that, on average, students in online learning conditions performed better than those receiving face-to-face instruction” (Means et al., 2009, p. 9). This statement contradicts previous research which compares online and on-campus education. The authors note however that caution should be exercised in interpretation, given that results may not be directly generalisable. Indeed it is possible that some of the online cohorts may already have been well educated, motivated and working in demanding fields such as medicine and education, while on campus attendees may have been younger students with fewer learning experiences, and that this could have influenced the results.²

One of the most influential studies which found no significant differences between online and on-campus learning was the annotated bibliography by Russell (1999) which reviewed 355 studies on distance education produced between 1928 and 1998. Some of the early studies examined correspondence courses, but most compared instruction over videotape, interactive video, or satellite with on-campus, in-person study programmes. The comparisons were based on test scores, grades, or performance measures unique to the study and on learner satisfaction. However, only 40 of the 355 studies specifically included computer-based instruction, and the compilation was completed before the Internet became so pervasive (Connolly, MacArthur, Stansfield, & McLellan, 2006).

Research has in general terms tended to find few significant differences in outcomes and satisfaction ratings between on-campus and off-campus learners, (Duffy, Gilvert, Kennedy, & Kwong, 2002; Edwards, Hugo, Gragg, & Peterson, 1999). A study by Kessler (2007) using ANOVA and t-tests compared 176 students studying online and on-campus found no significant differences in grade scores between study modes. While some meta-analysis studies, principally the analysis by Phipps and Merisotis (1999), concluded there was no significant difference, they did find a significant variation in the outcomes of distance education and face-to-face education. For example, Zhao, Lei, Yan,

¹ Distance learning on the rise, Brian Towie, Metro Canada, November 25, 2008.

² www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf

and Tan (2005) found that low instructor involvement led to less positive outcomes for distance education but more positive outcomes as instructor involvement increased.

Connolly et al. (2005) found that online students performed better than on-campus students in their study. However, a major criticism of any evaluation research in this area is that this type of study tends to focus on one small part of an entire study programme (Phipps & Merisotis, 1999). Despite these shortcomings of distance education, it is recognized that there are advantages to both students and institutions associated with this mode of learning (Mathews, 1999).

For the student, the increased flexibility widens and eases access to study, and for the institution, distance learning provides an opportunity to increase student numbers without necessarily having to invest in expensive real estate. Gagne and Sheperd (2001) report that online students will often incur higher fees than on-campus students and the institution may have higher start up costs in terms of providing a virtual learning environment (VLE), and additional tutor support. While comparative studies indicate that there are few significant differences in grade outcomes and student satisfaction rating between on-campus and online student cohorts, these studies do describe issues that must be addressed in online programme delivery. The changing and diverse environment in which distance education is practiced has inhibited the development of a single theory upon which to base practice and research. A variety of theories have been proposed to describe traditional distance education.

The debate on whether online learning can adequately compare to on-campus learning is discussed by Simonson, Schlosser, and Hanson (1999) in their discussion of what has become known as Equivalency Theory. The theory consists of the concepts of equivalency, learning experiences, appropriate application, students, and outcomes. Central to this theoretical approach is the concept of equivalency in the learning experience between traditional forms of learning on campus, and the new emerging forms of off campus learning at a distance. Simonson et al. (1999) argue that on-campus and distance learners have different learning environments, and that it is the responsibility of the tutor to design learning events that provide experiences with equal value for learners. Perhaps the most common model used for creating instructional materials is the ADDIE Model. This acronym stands for the 5 phases contained in the model: Analyze, Design, Develop, Implement and Evaluate (Piskurich, 2006).

Student Support and Equivalency

To replicate equivalency as described by Simonson et al. (1999), the VLE Blackboard used with the University of the West of Scotland was deemed an appropriate application as it could be used as a central hub for all students (both on campus and online) to meet and interact using the asynchronous discussion forms. Online students could also access

interactive lectures with their tutor in synchronous live lectures using Nefsis desk top video-conferencing.³

All students had the same interactive written support material, posted to them and this was also available in an online format. These written materials include discussion sections that corresponded to the discussion forum activity in the VLE. Within each of the five units contained in the course materials there were questions which had to be answered before moving on to the next subsection within each unit. A recommended reading list was provided to all students to encourage wider reading and easy access to electronic journals was available via the Athens system. The resources of the on campus library were available to all students. These research papers are accessed in either PDF or word file formats which can be printed out in paper or read on computer screen.

All students, no matter the study mode, are expected to access the VLE actively and to engage in synchronous and asynchronous discussions with tutor and other student learners. Debate in the VLE and in the classroom increases their knowledge and critical analysis of research in this highly contested field. All students download, complete and submit all assessments via the VLE. There were two written assessments; one midterm assessment of 1500 words and one end of term assessment of 3500 words. The assessments tested the ability of the postgraduate student to critically analyse, compare contrast and synthesise the broad theoretical frameworks within models explaining addiction. The on-campus students were able to have face-to-face discussion to help them construct an adequate assessment. The online students were provided a criterion document to be uploaded to the VLE for discussion, and individual e-mails and telephone conversations attempted to create a comparable substitute for the face-to-face on-campus experience between tutor and student.

Individual tutoring was available on request to any student. Students could contact the tutor via e-mail, telephone or if on campus at lecture/tutorials or simply by calling in to the office. Learning support also made appointments for students with the tutor. All e-mail messages were answered in less than 48 hours except in exceptional circumstances.

An overview of the support available to each study group is in Table 1 below.

³ Nefsis is a web-based technology from 'Wired'. It is a live interactive web broadcast where online students can see and hear the lecture that was delivered on campus in a PowerPoint format. This is also saved as a flash file resource for viewing at any time.

Table 1: Student support and activity by study mode 2007–2009

	Distance learning interactive paper based materials	Attendance at on-campus lectures	Attendance at off campus tutorials	On-campus teaching materials in VLE	Web chat and discussion boards via VLE	Access to tutor via telephone, e-mail.	Access to tutor via desk-top video conferencing
Group 1 On-campus	Yes	Yes	No	Yes	Yes	Yes	No
Group 2 online	Yes	No	No	Yes	Yes	Yes	Yes

Methods

The objectives of this evaluation were to assess the effects of study mode on student achievement in terms of summative grade for a postgraduate module, part of a postgraduate award in Alcohol and Drug Studies at the University of the West of Scotland.

Two modes of study were compared:

- Group 1: on-campus study with access to VLE (full and part time)
- Group 2: online study via VLE (part time only)

Group 1 is supported both online and face to face, widely known as “blended learning” or “integrated learning.” Group 2 is supported wholly online with no on-campus or direct traditional face-to-face tutor contact.

The module selected for investigation within this study was titled Understanding Substance Use and Consequences.⁴ This module is a core module which students normally take first as part of a postgraduate programme in Alcohol and Drugs Studies. A total of 174 students’ results were considered within this study with 75 students registered for the module under investigation in 2007, 38 in 2008 and 61 in 2009.

There are on average around 24 full time on-campus students awarded a full study and support grant from the Student Awards Agency for Scotland (SAAS) each year who study only on campus; all other students study on a part-time basis, either on campus or online by distance learning.

Statistical analysis using 1 way ANOVA was used to compare academic achievement between the two groups for each year the same module was delivered. The grades (summative marks) for each student at the completion of the module were entered into SPSS. Data was analysed using independent t-tests, where Independent variable was type of learning each participant received, and the dependent variable were the grade scores.

⁴ Formerly “Understanding Drugs, Alcohol and Consequences.”

In order to discover if grades were related to study mode, average grades were calculated for each mode of learning (or group) and over the three years of this current evaluation.

Table 2 notes the number of students on each cohort of delivery in years 2007–2009 and identifies those studying by each study mode i.e. on campus or online.

Table 2: Student numbers on module
Understanding Substance Use and Consequences

	2007	2008	2009
Group 1 – on campus	44	24	30
Group 2 – online	31	14	31
Total Numbers	75	38	61

Results

In Table 3 it can be seen that following testing, no significant differences in grades (summative marks) between online and on-campus groups was evident.

Table 3: Student grades independent-samples T-test outcomes

Year	Student Group	Mean grade scores (Std Deviation)	T (df)	p-value*
2007	On campus	60.1 (11.2)	t(66) = .289	.773
	Online	60.0 (13.1)		
2008	On campus	46.6 (17.1)	t(33) = .193	.637
	Online	42.7 (22.9)		
2009	On campus	45.1 (15.7)	t(52) = -.304	.762
	Online	46.6 (14.1)		
Total	On campus	50.7 (16.4)	t(155) = -1.4	.158
	Online	54.6 (16)		

*There were no significant differences between the groups on each of the tests.

Discussion and Conclusion

Data in Table 3 indicates that academic grades were not influenced by the type of learning environment to which students were exposed. This was true of each year when analyzed individually and of the three years overall. These findings suggest that the online learning environment, as constructed in this particular case, serves as an environment for students to learn and achieve grades appropriate to their abilities, when compared to the traditional on-campus supported learning environment. This indicates that utilizing a distance learning model for students does not adversely influence grades scores, and this ongoing evaluation suggests that it is appropriate to continue delivering this module using both on-campus and online delivery methods without any negative impact on student performance.

The introduction of a more flexible approach to student support has indeed created more study choices for students but these choices are not without cost to the staff and institution. For example the increased flexibility of teaching delivery may have reduced face-to-face teaching on campus; however what has certainly increased is the “face to screen” time on the VLE. In comparison with on-campus learning, the online students’ experience of learning is more time intensive, and as a result this increased activity was recorded by the tutor in terms of workload activity which appeared to increase between on campus and online study modes. As there were no significant differences in grades scores by study mode, it would imply that whatever mode of study, student grades do not differ significantly between study modes. This study similar to others comparing online with on-campus study modes has focused on only one module from a range of modules in our postgraduate programmes.

This study assessed the effects of study mode on student achievement in two modes of study: online learning, on-campus learning. Statistical analysis revealed no significant differences in grades (summative marks) between online and on-campus groups. However, to achieve equivalence, online students required more tutor assistance than on-campus students. Similar to other research these findings indicate that students are not disadvantaged by opting for study via online learning.

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