

Leadership Development Using Three Modes of Educational Delivery: Online, Blended and Face to Face

The use of information communication technology (ICT) to deliver educational programs is now well established in the higher education sector (Ellis, Ginns et al. 2009). Learning management systems have also evolved significantly over the past ten years and enrolments in online education programs have increased significantly. For example, growth rates in online enrolments in higher education have increased up to 35- 50 per cent (Sun, Tsai et al. 2008) and continue to grow. During 2007 – 2008, online course enrolments in the United States of America increased by 12.9 per cent in excess of total higher education student enrolments (Baker 2010). With the advent of WEB 2.0 technology, virtual interaction with students has become significantly easier (Halsne and Gatta 2002) and this enhanced interactivity will no doubt strongly influence enrolment growth in online education.

Business schools have not let this growth cycle pass without notice. Leadership education at postgraduate levels has been strongly influenced by the growth of information technology (Arbaugh, Godfrey et al. 2009). Students in these courses often require flexible learning design, which online and blended learning programs can provide (De George-Walker and Keeffe 2010). Post graduate business students are often working full time and need to balance education with work, travel, and family commitments (Millson and Wilemon 2008). Academic programs have responded to this demand by providing courses in fully online mode (Arbaugh and Duray 2002; Ladyshevsky 2004) while still maintaining face to face delivery for students seeking this form of education. There is also blended learning, which is a mixture of face to face instruction with elements of online

learning (Koohang 2009; De George-Walker and Keeffe 2010). In blended learning, the instructor needs to consider the learning outcomes of the course, and then design the correct balance between face to face and online activities (Osguthorpe and Graham 2003). The advantages for universities and students in blended and fully online courses are convenience, enhanced learning, flexibility, higher interaction, and increased retention rates (Koohang 2009).

In a major review of the online learning literature in business, studies relating to management tended to focus on entrepreneurship, international management and labour studies (Arbaugh et al., 2009). There was negligible research exploring the achievement of learning outcomes relating to leadership. Further, the primary themes that emerged from studies within the management discipline tended to focus on student perceptions, attitudes and behaviours regarding online courses and comparison studies between classroom and online based formats.

This paper explores how different modes of course delivery enable the achievement of life-long learning skills that support leadership development. The leadership development experience often involves the completion of a 360 leadership survey (Toegel and Conger, 2003, Wood et al., 2000), the construction of a learning development plan, and face to face meetings with a coach (Boyatzis and Kram, 1999, Kolb, 1984b). Theory is delivered where appropriate and necessary to assist learners with development planning, interpretation of surveys and coaching.

Attendance at leadership development programs or courses can be a very costly and time consuming commitment for an individual. It can also be costly for organisations that pay for staff to attend such development courses. Quite often, the individuals who

attend these leadership development programs are time poor, have pressing work demands, and often struggle to maintain work life balance. All of these factors can impact on the leadership development experience and the transfer of training that follows participation (Baldwin and Ford, 1988, Cromwell and Kolb, 2004). Delivering leadership development through different delivery modes, may offer individuals and organisations more flexibility and increase commitment and retention in these programs.

Face to Face, Blended and Fully Online Learning

Much of the earlier research that explored online learning focussed on the internet as an exciting form of technology that had the potential to support learning, rather than focussing on whether it actually enhanced the learning process itself (Sweeney and Ingram 2001). During this time there were many critics of online learning, and as a result, earlier research, including that in the management sciences (Arbaugh, Godfrey et al. 2009), explored student attitude and satisfaction with online learning, interactions of students with faculty, student learning outcomes, and faculty satisfaction (Schachar and Neumann 2010). What grew from this research was that online learning could offer educational delivery in different ways, but that human interactivity was still needed, and just posting information into a web based learning management system and expecting students to 'learn' by themselves was ineffective. This approach would also have been very ineffective for the development of life-long learning skills that support leadership development given the need for more experiential learning approaches (Boyatzis and Kram, 1999, Kolb, 1984b, Toegel and Conger, 2003, Wood et al., 2000).

Through this earlier research factors which lead to a high quality online learning experiences were identified. For example, it is now clear that high quality online learning experiences require a pedagogical approach that creates a responsive and creative learning environment (Lang and Costello 2009). Online courses need to be collaborative, promote inquiry, and encourage communication (Huynh 2005). The pedagogical design should also include opportunities for formative as well as summative feedback and engage students with input and support from the online facilitator. Many of these important factors were identified initially by Chickering and Erhmann (1996) who noted that an effective online program should include:

- student to teacher contact;
- active learning techniques; prompt feedback;
- communication of high expectations, making contributions relevant;
- respect for diverse learning communities; and
- reciprocity and collaboration among students.

By following these pedagogical strategies, more positive educational outcomes for the learners are likely to surface as they mirror or exceed many of the practices that take place in face to face programs.

Research over the past ten years has also focussed on whether online learning is an effective and appropriate method of delivery in comparison to face to face delivery. Research in this area has had its challenges as it is difficult to control given that there are a lot of variables that may moderate results when exploring learning outcomes across different modes of learning (Schachar and Neumann 2010). The design of the course, pedagogical approaches, student and instructor characteristics, and assessment methods are all factors that can have an impact on outcomes (Piccoli, Ahmad et al. 2001; Lang and

Costello 2009; Picciano 1998; Graham and Scarborough 2001; Swan 2001; Peltier, Drago et al. 2003; Huynh 2005).

A large and significant meta-analysis conducted on distance learning versus face to face learning in university and college education from 1990 – 2009 found that in 70 per cent of cases, students taking courses by distance outperformed their counterparts in the face to face courses (Schachar and Neumann 2010). This study included 125 studies and involved 11,500 students in face to face mode and 9300 students in distance mode. Four periods were examined in order to capture the evolution of online learning. The most noteworthy period in this study was period four (2003 – 2009), as it best captures contemporary approaches to online learning. The research by Schachar and colleagues found a clear and significant upward trend in positive effect sizes for 2003 – 2009, which is the period where education experienced an explosion in the use of information communication technology to support learning. The conclusions from this research were that distance education is not only comparable to face to face instruction, but can also outperform face to face education. Their findings also complement major previous meta-analyses, such as the US Department of Education’s meta-analysis (Yuki Toyama, Murphy et al. 2009) undertaken a few years earlier. Schachar and colleagues predict that academic performance in online versus face to face delivery will likely widen in the future. Given the advent of WEB 2.0 technologies, and their capacity to heighten interactivity considerably, which would not have been represented to a large degree in their ‘period four’ analysis, their predictions have strength. Further research exploring learning outcomes in fully online and blended learning by subject area and academic discipline, however, are still areas requiring further research (Baker 2010; Schachar and Neumann 2010).

The implications for the achievement of learning outcomes using different modes of delivery in leadership development still require further exploration. These meta-analyses don't explore the unique ways in which course design lead to these positive outcomes, and have not included the discipline of leadership development to a great degree (Arbaugh, Godfrey et al. 2009). The emerging educational research in online learning, therefore, is now exploring what instructional strategies are most effective for this mode of delivery (Baker 2010), and more importantly by subject area. Further, the research is also looking more closely at outcome and design factors associated with blended learning. This research attempts to explore these different modes of delivery on the achievement of set learning outcomes in a leadership course designed to provide students with life-long learning skills that support leadership development.

Pedagogical Differences by Mode of Delivery

The positive benefits and outcomes seen in fully online courses appear to stem from the social constructivist interaction that takes place online. Constructivist theory argues that learning takes place when new knowledge is constructed, often as a result of the social interaction with others (Piaget 1977; Dewey 1998; Vygotsky 1978). Collaboration has always been a prominent factor in online-learning practice and research (Redpath, 2012) . Students in online learning environments co-create and share knowledge during synchronous and/or asynchronous online discussions. This constructivist pedagogy, which emphasizes self-directed discovery and construction of meaning is a dominant trend in e-learning (Redpath, 2012). This social constructivist interaction provides learners with advantageous learning outcomes quite specific to fully online learning (Bekele and Menchaca, 2008, Redpath, 2012). It is also strengthened when instructors provide

adequate teaching, cognitive and social presence in the collaboration spaces (Arbaugh, 2010, Redpath, 2012).

While constructivist learning can occur in any mode of learning it is usually enhanced in fully online courses, and in appropriately designed blended learning courses, because of the interaction built into these courses. In face to face classes, students often sit passively in lectures, which are often very large, or interact with the lecturer to clarify points of presentation or to ask questions about assignments.

Students in the fully online and blended modes must work more critically and interactively within the course in order to be productive participants. This social constructivist and learner driven focus on learner outcomes has been emphasised and identified in the literature (Wittrock 1986; Sweeney and Ingram 2001; Dewar 1999). This approach forces students to engage in more self explanation and to make tacit knowledge explicit, which reveals knowledge gaps, affirms learning and leads to heightened cognitive and meta-cognitive gains (Piccoli, Ahmad et al. 2001; Flavell 1979; Higgs and Titchen 2000).

With the research also indicating that student performance in online learning equals or often exceeds face to face learning formats, this research focuses specifically on whether these same outcomes occur in a course, at the post-graduate level, to develop life-long learning skills that support leadership development. Hornik and Tupchiy (2006) examined 13,000 students in 167 courses between 1997 and 2003 and found that online grades were higher for subjects with high paradigm development (e.g. hard sciences, nursing and health) and lower for subjects with lower paradigm development (e.g. social sciences, humanities) and that these were particularly marked in advanced level courses. These findings are of interest to a leadership course delivered in different modes, which

would be in the category of having lower paradigm development. The use of blended learning as a third mode of design is also included in this research to see if this has an impact on performance, in comparison to fully online and face to face delivery. Much of the research in management sciences regarding mode of study has been narrative in nature and qualitative (Arbaugh et al., 2009). This research takes a quantitative perspective.

Methods

Given the research findings above, the hypothesis for this research is a difference in the achievement of life-long learning skills to support leadership development across the three modes of delivery (fully online, blended and face to face). Life-long learning skills, as measured in this study, are the ability to interpret feedback received from self-assessments such as the Myers Briggs Type Indicator and external reviews such as the 360 degree survey (Quinn et al., 2011) used in the course. It also measured the ability to create a learning development plan using principles of experiential learning (Kolb, 1984a). The last component of life-long learning skills that support leadership development related to reflective practice (Schmidt-Wilk, 2009, Schon, 1991) and the ability to create journals that documented their learning during the peer coaching process (Ladyshevsky and Ryan, 2006).

The Leadership Course

A post-graduate course focussing on leadership development was the focus of this research. The course is part of a post-graduate master degree in business leadership, but is often selected as an elective for other post-graduate master degrees in the university, for

example, masters of business administration students. Blackboard was the learning management system used to support the online aspects of the course. Each mode of the course contained the same twelve topic modules which ran over the course of a full trimester (14 weeks). Students were required to spend on average 12 hours per week on their course. The course covered a range of topics to improve a graduate student's leadership and management potential and included such topics as: emotional intelligence; communication; the manager as coach; stress management; visioning and values based leadership; personality; negotiation; and conflict management. All course resources such as powerpoint presentations, links to journal articles, websites of interest, handouts, and ilectures were contained within a central repository within Blackboard, regardless of mode of study.

The learning outcomes for the course are noted below and relate to the overall objective of providing students with life-long learning skills to support leadership development and growth.

1. Evaluate personal management and leadership competencies, and then apply experiential learning principles in developing a leadership learning plan for implementation.
2. Devise strategies for life-long leadership learning skills such as objective setting, reflective journaling and peer coaching.
3. Analyse the literature on 'coaching' and apply these skills, as part of a leadership development strategy with a peer.

Students in a face to face class would attend weekly classes for 12 weeks (3 hours per week) led by the instructor in an interactive seminar format. Course resources such as readings, handouts and power-point notes were all uploaded and available online. Hence, the use of Blackboard was supplemental to face to face classroom delivery. Interaction

between the instructor and students was predominately limited to the classroom and involved lectures, group discussions, role plays, self-assessments, and watching videotapes and discussing key points. This approach would not be that different to many organizational leadership development programs spread out over several weeks.

Students in the blended version of the course would attend their classes in a concentrated format (two full days each week for three weeks) to complete the required 36 hours of tuition. All other aspects of the course would be delivered online, including communication with the instructor and their peers through asynchronous discussion boards. Again, course resources were uploaded and available online and the classroom sessions were presented in a way that was very similar to the face to face weekly sessions.

Students in the fully online version of the course would complete all aspects of their study online, including class discussions and interactions with other peers in the class. Students would watch lectures, could post questions on content in discussion forums, participate in key topic discussions, work through self assessments, and watch videotape cases online. Course design in the online mode adhered to design principles described by Chickering and Erhmann (1996) and included extensive student to teacher contact; active learning techniques; prompt feedback; communication of high expectations, making contributions relevant; respect for diverse learning communities; and reciprocity and collaboration among students. Again, all course resources were uploaded and available to the students online.

Assessment of Student Performance

All students, regardless of their mode of study, completed two leadership development projects that were exactly the same. These projects were aligned to the learning outcomes. This alignment of assessment, reward and student behaviour towards learning outcomes has been described by Biggs as 'constructive alignment' (Biggs, 2003). Constructive alignment is based on students constructing meaning through the learning activities that are set for them in their course. In other words, how do students view the interrelationship between assessment, reward value and the effort and action they must exhibit in order to achieve the stated learning outcomes. If the assessment, rewards and required student behaviour are aligned with the learning outcomes, relevant learning will occur because these drivers push the students in the appropriate direction (Biggs, 2003).

The first project was the completion of a 360 degree leadership survey (Quinn, Faerman et al. 2011), with an accompanying interpretive report analysing their findings. They then had to create a leadership development plan for implementation based on experiential learning design principles (Kolb 1984). This first project was referred to as the Leadership Development Plan (LDP) and addressed learning outcomes one and two above.

The second project, a continuation of the first, was to begin the implementation of the leadership development plan with the support of a peer coach they selected from the class. The use of peer coaching to support leadership development has been used successfully in the past (Ladyshevsky 2006). A minimum of three reciprocal peer coaching sessions were required to complete this second project. This second project was a written submission of three reflective journals describing progress on their learning plan and how peer coaching had influenced their development. This project was referred to as the

Leadership Coaching Program (LCP) and addressed learning outcomes two and three noted above.

The peer coaching component could be done face to face, or virtually, or a combination of both. It could include simple technologies such as the telephone or email through to face to face coaching using web cameras and interactive software applications such as MSN Messenger or SKYPE.

The same unit controller managed all deliveries of each course so was able to ensure, for the most part, that course outcomes, content and material were standardized across the different modes of delivery. The unit controller was also one of three different instructors who were involved in teaching the course and worked very closely with each instructor to ensure, as much as possible, the course was taught in such a way that students would be able to achieve the set learning outcomes. Each course, regardless of mode of delivery had approximately 30 – 40 students. Each instructor was responsible for teaching the course independently and grading the projects against a standardized rubric and set of criteria. Each instructor's grades were moderated and benchmarked against the unit controller when they started to grade projects for the first time as a strategy to ensure, as much as possible, inter-rater reliability. The process involved the unit controller and instructor grading a set of projects separately, and then reviewing the grades and feedback awarded. Where discrepancies were noted discussions took place against the criteria until such time that there was good inter-rater agreement.

Computer literacy of these students was considered to be high given earlier research on the student population at the university (Ladyshevsky and Nowak 2000). The specific data that was collected on all students for this study included: mode of study (face

to face, blended or fully online); gender; final grade for LDP and LCP projects and the instructor that graded their projects. The study received ethics approval from the University's Human Research and Ethics Committee.

Data was collected on all 550 students who had taken the leadership course across the three different modes of study. The average age of students in the business school tends to cluster around the early 30s, with students coming from diverse areas such as mining and engineering, health, government and the private sector. The majority (90 per cent) are working full time and study part time.

Factorial ANOVA was used to test for significant relationships between the LDP and LCP project results, and the mode of study, gender and instructor for these 550 students. While mode of study is the variable of most interest in this study, past literature demonstrating gender differences justified gender as a potential explanatory variable (Arbaugh 2000). Instructor is included for two reasons. First, different instructors may assess performance using different regions of the percentage scale (although moderation was undertaken in an attempt to eliminate this possibility). Second, the instructors predominately taught in different modes of study and this could impact their assessment. Instructor A assessed 161 (29%) of the assignments and predominately taught in the blended/face to face mode although did some online teaching. Instructor B assessed 295 (54%) of the assignments and predominately taught in the online mode. Instructor C assessed 94 (17%) of the assignments and taught solely in the face to face mode. Statistical analysis was performed using the General Linear Model procedure in PASW Statistics 18. The General Linear Model is a form of multiple regression more suitable for explanatory variables such as mode of study that are categorical in nature. ANOVA tables were

constructed to test for two and three way interactions in addition to the main effects of the three explanatory variables: mode of study; gender and instructor.

Results

Of the 550 students involved in the study, 303 (55 per cent) were male and 247 (45 per cent) were female. For mode of study, 242 (44 per cent) students undertook the course in face to face mode. Another 86 (16 per cent) students completed the unit in a blended mode whereas 222 (40 per cent) students completed the unit fully online.

Table 1 contains summary statistics for the project results (as percentages) for the Leadership Development Plan (LDP) and Leadership Coaching Program (LCP). The correlation between the LDP and LCP scores of the 550 students is 0.382. Although this correlation differs significantly from zero ($P < 0.001$) this correlation is low considering the two project tasks are integrated since the LCP involved implementation of a plan developed in the LDP. This low correlation suggests the LDP and LCP are measuring different constructs of student performance and hence are analysed separately below.

Table 1: Summary results (%) for the LDP and LCP Projects for all 550 students.

	Minimum	Maximum	Mean	Std. Deviation
LDP	40.0	94.3	74.6	7.9
LCP	42.5	95.6	77.4	6.9

ANOVA results for the LDP revealed not only significant mode of study effects ($P < 0.001$) but also a significant interaction between mode of study and gender ($P = 0.031$). No other effects, including interaction effects, were statistically significant ($P > 0.05$) and so are not shown here. Thus the mode of study is significantly related to LDP grade, however, this

relationship differs for males and females. This relationship is summarised in Table 2, which contains the mean result (standard errors are in parentheses) for each mode of study and for males and females separately. While females perform significantly ($P = 0.005$) better in the face to face mode in comparison to their male counterparts (74.1 per cent versus 71.1 per cent respectively) they perform slightly (and insignificantly: $P = 0.791$ and $P=0.529$) less well than their male counterparts in the blended and fully online modes of study.

Table 2: Mean LDP result by mode of study and gender (standard errors in parentheses)

Mode of study	males	females
Face to face	71.16 (0.65)	74.07 (0.74)
Blended	74.31 (1.15)	73.86 (1.17)
Fully online	77.34 (0.68)	76.74 (0.77)

Table 2 demonstrates a trend of increasing LDP grades from face to face, then blended, and then fully online mode of study. This is particularly strong for males with mean performance ranging from 71.16 for face to face to 77.34 for fully online. For females, the trend is substantially weaker, primarily due to their relatively high performance in the face to face mode of study.

For the LCP project there was also significant evidence that grade was related to mode of study ($P = 0.031$), however, unlike the LDP there was no evidence that this relationship differed depending on gender ($P = 0.921$). Table 3 contains the mean LCP grade for the three modes of study (standard errors are in parentheses). Fully online students perform significantly higher than the face to face ($P = 0.027$) and blended ($P = 0.023$) students, however, there is no significant difference in the performance of the face

to face and blended students for the LCP project ($P = 0.709$). Although still statistically significant, the relationship between LCP grade and mode of study is substantially lower than the relationship for LDP above.

Table 3: Mean LCP result by mode of study (standard errors in parentheses)

Mode of study	Mean LCP Result
Face to face	77.63 (0.44)
Blended	77.28 (0.79)
Fully online	79.43 (0.64)

There was also significant evidence of a relationship between instructor and LCP grade ($P < 0.001$). Compared to instructor C, instructor A gave mean LCP lower by 2.82 and instructor B gave mean LCP lower by 5.20. Note that the above results for mean LCP (Table 3) are adjusted for instructor and hence are estimated after adjusting for this instructor effect.

Discussion

Course Design and Performance

The results suggest that students in face to face, fully online and blended learning modes were all able to achieve comparable learning outcomes in the course. The students were able to successfully complete and analyse their 360 degree leadership results and develop a learning development plan (learning outcomes one and two). They were also able to successfully complete their peer coaching sessions and write reflective journals and report on their key learning (learning outcomes two and three).

Students who experienced their course in the fully online format, tended to do significantly better than those in the face to face and blended learning modes, particularly the LDP assignment. These findings are consistent with the evidence in the literature (Ladyshevsky 2004; Sitzmann, Kraiger et al. 2006; Education 2009; Schachar and Neumann 2010) which indicate that fully online learning outcomes can equal or surpass outcomes in face to face classroom education. The hypothesis that there will be significant differences across the three modes of study is supported. The utilisation of different modes of learning to promote life-long learning skills that support leadership development, therefore, did not seem to suffer under any particular mode of delivery and suggests that this subject and discipline area is conducive to fully online educational strategies (Ladyshevsky, Geoghegan et al. 2008).

This finding may be of benefit to organizations exploring different development models for leadership development and education in their companies. The flexibility offered by online courses may better suit the demanding schedules of leaders in some organisations. Organisations with leaders dispersed across geographical areas and companies with high levels of executive travel may also find leadership development through online delivery beneficial. Online delivery may remove the need to take leaders away from their places of work and even allow them to pace their learning in tandem with their experience. Learning can also be extended across a more suitable time frame allowing for more reflection and coaching, critical components of leadership development (Boyatzis and Kram, 1999).

The reason for the fully online students as a whole, achieving higher scores on their projects and thus the learning outcomes, may be a function of specific student

characteristics associated with learning style preferences. As noted in the literature, students with a more visual and systematic approach to learning, with a predilection to work independently, may self select into a fully online mode of study (Halsne and Gatta 2002; Terrell 2003). It has also been suggested that fully online learners often have more motivation and determination to work independently, and that these characteristics influence their performance (Dunlop and Scott 2001; Richardson and Turner 2000; Felix 2001) and perseverance to do well (Bacani and Rohlf's 2000). Motivation is clearly a big influence in success, and this study suggests that a range of delivery models may be appropriate beyond the face to face leadership development experience. Training and development organizations, such as universities might consider offering their leadership courses in different modes.

The design of the particular course may have also been a factor in the elevated performance of students in the fully online mode. In the face to face and blended learning modes, the course content is delivered and facilitated by the instructor. While student engagement is encouraged and there are often animated and lively discussions in the classroom, the contract is generally for the instructor to convey the key concepts to the class. In the fully online environment, all of these concepts are available to the students via i-lectures which the students can watch online. While these are available to the face to face and blended students, it is not a requirement that they watch them. What differentiates the fully online students is that they have to take on board the concepts that are covered in the i-lectures, as well as the supplementary readings, handout and web information (which are again available to the other students in other modes) and use this

information to construct intelligent and responsive comments in the online discussion forums.

There were three discussion forums in the online group which build in concepts from the various topics covered in the 12 modules and were strategically designed according to constructive alignment principles (Biggs 2003). In order to be intelligent and responsive, online students have greater accountability and responsibility for understanding the course material as they have to debate, comment and share their views on these concepts in a written public domain. It may be this discussion, in part, which fuels the social constructivist knowledge gains that have been reported in the literature that support the positive effects seen in fully online learning (Sweeney and Ingram 2001; Wittrock 1986; Dewar 1999; Piccoli, Ahmad et al. 2001; (Redpath, 2012). This heightened learning can be embedded into projects and thus the demonstration of higher level learning outcomes.

There were no significant differences in learner performance between face to face and blended learning in this study. This may stem from the fact that in both cases, course lectures were delivered in face to face mode for the face to face and blended courses. The differentiating factor was that in the blended learning mode all subsequent communication about assignments, feedback, and questions about the course occurred online. There were no academic discussions in asynchronous chat rooms, only discussions related to projects and course management issues. There may have been a more distinct difference in the blended learning mode if the course had been more finely tuned towards using delivery methods that were specifically matched to aspects of the course (De George-Walker and Keeffe 2010). For example, delivering some of the key lectures,

because of the nature of the content, in face to face mode and providing other lectures online, with discussions occurring through synchronous or asynchronous mediums. Comparisons of blended learning to face to face and fully online courses are not well represented in the literature (Schachar and Neumann 2010), and this may be in part, to the difficulties in defining what a 'blended' course looks like (Osguthorpe and Graham 2003; Koohang 2009).

Gender and Course Performance

An interesting outcome from this research was that females performed significantly better than males in the face to face mode for the LDP assignment. However, their performance was insignificantly worse in the fully online and blended learning modes for this same project. The LDP project requires a lot of collaboration between students as they must collate the 360 degree leadership data for their partner then present it to them and work collaboratively to construct their development plans. Hence, there is a significant amount of communication and collaboration that must take place during the early part of the course which may suit gender specific learning preferences. In past research on gender differences in online learning (Arbaugh 2000) it was reported that men saw cyberspace and the internet in general as a means of delivering education quickly. They also tended to communicate via the medium in a competitive mode by either elevating their own status or by lowering others. Women, in contrast, saw cyberspace as a means to develop increased collaboration and support networks for increasing learning and communication of the group. Female preferences for more interactive and collaborative learning outcomes may have been more well served in the face to face mode than the fully on line mode. Greater opportunities in the online environment to create the

level of engagement preferred by women may have narrowed this significant difference as previous research suggests that women participated more than men in online class discussions in strategy courses (Arbaugh et al., 2009). Although Arbaugh's research did not find any gender based differences in achievement, they did find through chi-square analysis a slight preference for collective participation amongst women at the post graduate level in a particular business unit (Arbaugh 2000).

The LCP did not demonstrate a gender difference in the achievement of learning outcomes. As this assignment was a collaborative exercise between peer coaches, both genders would have had to exhibit the same degree of collaboration, regardless of mode of study. Hence, this factor alone may have removed any gender bias from this learning outcome.

Other research on gender differences in online learning have also been investigated in business education as moderators of learning outcome with one piece of research reporting no difference in gender for tutorials that were offered online (Sweeney and Ingram 2001). In a larger study on online learning, (Richardson and Turner 2000) found that women were more negative towards online learning partly due to computer literacy issues but also because they found it less collaborative. It would appear from the results of this analysis a preference for collaboration appeared to positively influence women in the face to face class for the LDP assignment. Again, further research with more collaborative WEB 2.0 technologies may eliminate this gender based preference if more real time collaborative spaces are created in the fully online environment.

Conclusion

This research goes beyond global comparisons of fully online and face to face education by exploring the use of information communications technology within three different delivery modes within the discipline area of leadership. This research provides evidence that three different modes of delivery were able to deliver comparable learning outcomes with respect to the development of life-long learning skills that support leadership development. Further research on blended learning is needed, particularly in more hybrid versions where there is perhaps equal face to face and virtual time. There also appears to be some evidence that collaboration, an important factor in the performance of women, could be further developed in online environments, particularly now that WEB 2.0 technologies have the capacity to deliver more of this in real time. Organizations should consider other modes of delivery to support leadership education, particularly the use of online mediums, as this may offer more flexibility for learners, reduce costs, and potentially increase learning outcome.

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