Blended spaces, different places: Getting the blend of ingredients right in a cross-cultural learning context

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As an increasing number of tertiary institutions are providing more blended learning spaces in an increasingly diverse cross-cultural space, it is imperative that the appropriate ingredients are blended in such a way as to satisfy the needs of these international participants. Since technology in itself is insufficient to meet this need, consideration must be given to the effect of culture on the various components of blended unit delivery. This paper reports on a research study of an accounting subject presented to two cohorts of engineers, one in Australia and one in Hong Kong. In terms of delivery of a blended subject in a cross-cultural context, it is proposed that one of the most important ingredients is the amount of face-to-face contact time to which students are exposed, with Chinese students performing significantly better as this is increased. Cultural differences also presented implications for assessment with students achieving better results when they worked in smaller groups, contrary to their stated choices.

Keywords: blended learning, cross-culture, Chinese, face-to-face, accounting, scaffolded

Introduction

In recent years, cross-cultural dimensions have been introduced in relation to the design and delivery of online subjects (Gerbic, 2005; Mercado, Parboteeah and Zhao, 2004; Selvarajah, 2006, Strother, 2003) and Chinese students' attitudes towards blended learning (Charlesworth, 2008; Chen, Bennett & Maton, 2008; Ku & Lohr, 2003; Thompson & Ku, 2005). The pedagogy of a blended learning environment is "based on the assumption that there are inherent benefits in face-to-face interaction as well as the understanding that there are advantages to using on-line methods" (Clark & James, 2005, 19). It has been suggested that such an environment promotes student-centred learning and encourages increased student interaction (Carmody & Berge, 2005; Davies & Graff, 2005; Gallini & Barron, 2002). Research papers have reported the increased benefits of a blended learning approach in relation to discussion forums and other collaborative features (Dzuiban, Hartmann & Moskal, 2004; Waddoups & Howell, 2002). In addition, by providing students with more control over their learning, blended learning can help foster critical thinking (Garrison & Kanuka, 2004). Other studies have addressed the techniques for blending elements of a traditional classroom with online education (McAlpine, Reidsema & Allen, 2006; McCray, 2000; Twigg, 2003; Yoon & Lim, 2007). These have included the effectiveness of online assessment systems (Dopper & Sjoer, 2004), computer tutorials (Merino & Abel, 2003) and scaffolded learning (Abraham, 2007; Abraham & Jones, 2008).

Much of this literature describes the experience of international students who have participated in a blended learning environment alongside domestic students in Australian, New Zealand or Canadian universities. The current study compares the relative performance of Chinese and Australian students in the same blended learning subject when studying in their own cultural environments, and analyses the components in order to recommend the appropriate blend of ingredients for providing optimum learning opportunities in cross-cultural spaces. The remainder of the paper is structured as follows. Section 2 provides a brief review of the literature in relation to cross-cultural perspectives and blended learning environment. Section 3 describes the two cohorts of students, discusses the study methodology and develops the hypotheses. Section 4 presents the data analysis which is then discussed in Section 5. Section 6 provides concluding comments and suggestions for future research.

Literature review

In addressing why educators choose to introduce a blended approach, Graham, Allen and Ure (2005) found that two main reasons were improved pedagogy and increased access and flexibility. Improved pedagogy is consistent with adopting a student-centred approach since blended learning strategies allow students autonomy in self-paced learning, increase the level of active learning strategies and enhance peer-assisted learning (Graham, 2005). Cottrell & Robison (2003) reported a blending learning strategy whereby online modules were used to build technical accounting proficiency while face-to-face classes focussed on developing decision making skills. Using such online capabilities to present self-paced units to introduce and build basics frees time for students to participate in interactive exercise in class time (Bourne, Harris & Mayadas, 2005). Furthermore, a blended learning environment "aims to enable students to take much more responsibility for their own learning by focussing on *what the student does*" (Subic & Maconachie, 2004, 35). By using action learning and reflective practice, blended learning promotes the adoption of deep approaches to learning, which is facilitated by group activities. Thus, an appropriate definition of blended learning is "an optimal combination of face-to-face and online education that improves learning and the satisfaction of instructors and students" (Bourne *et al.*, 2005).

However, learning styles and preferences vary greatly between cultures (Mercado *et al.*, 2004) and since technology is not culturally neutral (McLoughlin & Oliver, 2000), the attitude of Chinese students towards blended learning differs from students with Western-heritage (Smith, Coldwell, Smith & Murphy, 2005; Tu, 2001). Many Chinese students have a positive perception towards blended learning in that it resolves isolation, one of the traditional difficulties of online learning (Ku & Lohr, 2003), and provides fewer language barriers than in face-to-face situations (Zhao & MacDougall, 2008). However, Chinese students demonstrate a higher degree of anxiety in ensuring whether they meet assessment requirements and lesser willingness to contribute intellectually to online discussion (Smith *et al.*, 2005). Wan, Wang and Haggerty (2008) found that Chinese students who were more experienced in seeking information and communicating using online methods had higher levels of virtual confidence and that virtual confidences was an antecedent of good learning outcomes. This can been amplified by the introduction of scaffolding into the blended environment enables students to increase self-confidence and motivation (Abraham & Jones, 2008; Ku & Lohr, 2003).

Mercado *et al.* (2004) provided a theoretical understanding of possible adaptations to a blended learning unit that would make it more readily received in a cross-cultural environment. Considering Asian students in general, Selvarajah (2006) stressed the need for assessment methods to consider the different learning styles in order for expected knowledge transfer to take place. More specifically, the learning style of Chinese students tends to be "more sensing that intuitive, visual rather than verbal, deductive over indicative, more reflective than active, and sequential rather than global (Strother, 2003, p.356). Stacey and Gerbic (2007) concluded that careful design and preparation is required to teach effectively for blended learning in a cross-cultural context. The superiority of a blended learning environment over traditional delivery of an accounting subject was substantiated by the study of two cohorts of engineering students on a Australian campus (Abraham, 2007). However, when this same blended unit was offered in Hong Kong, the Chinese students achieved significantly different results to a comparable Australian cohort. The current study considers student demographics and performance in order to ascertain the particular areas where these cross-cultural differences were evidenced in practice, and thus to provide some insight into the differing mixes of ingredients that are appropriate in "blended spaces" in "different places".

Methodology

The two cohorts consisted of a group of nine Australian-born students and fifteen Hong Kong students of Chinese heritage. All twenty four students were qualified engineers employed full-time by a government statutory authority, the Australians by RailCorp (RC) and the Hong Kong students by the Mass Transit Rail Corporation (MTRC). These individuals had been selected by their employers to undertake part-time study towards an engineering masters degree, which, this semester, included one compulsory engineering subject plus a compulsory accounting subject, both delivered in a blended learning mode. Due to the similarity of the two cohorts, and the fact that the same academic would be delivering the same accounting subject, it was expected that the students' results would be similar. However, as the result of budgetary constraints, there was one major difference between the way in which the subject was delivered to the two cohorts. The RC cohort received a total of 30 hours of face-to-face contact with the teacher spread over the 13 week semester, while the MRTC cohort received only 6 hours face-to-face contact, and this all occurred in the first week of the semester. Thus, it appeared that the disparity in learning

outcomes was a result of this varying personal contact time. Nevertheless, to provide rigour to the investigation, attention was also given to two other distinct areas: demography and assessment structure.

Demographic differences

The information summarised in Table 1, indicates that the two cohorts were evenly matched for gender and age, with the only significant demographic variable being the country of birth. In order to assess the relative academic ability of the two groups, the performance of the two cohorts was compared for the engineering subject in which they were concurrently enrolled. Whereas the overall results for all students in the two post-graduate subjects had a significant correlation, the performance for the two cohorts varied with the particular subject. For the engineering subject, there was no significant difference between the results achieved by each cohort. However, there was a significant difference between cohort outcomes for the accounting subject, which raises the question of whether teaching accounting to engineers in a cross-cultural context requires special adaptations, not required for engineering subjects. This in turn provoked further investigation into the structure and assessment of the accounting subject.

Table 1: Demographic statistics of the two cohorts

	Australian cohort n = 9	Hong Kong cohort n = 15	Correlation (Pearson coefficient)	Significance (2-tailed)
Gender				
Male	8 (89%)	14 (93%)	-0.078	NS
Female	1 (11%)	1 (7%)		
Age				
Mean	36.89 years	40.93 years	0.305	NS
Std dev	5.86 years	6.67 years		
Country of birth				
Australia	9 (100%)			
Hong Kong		13 (86.7%)	0.805	sig at $p < 0.01$
China		1 (6.7%)		
Malaysia		1 (6.7%)		
Accounting subject				
Mean	80.44%	68.13%	-0.446	sig at $p < 0.05$
Std dev	5.20	10.68		
Engineering subject				
Mean	87.11%	78.20%	-0.031	NS
Std dev	7.59	16.24		

Subject structure and delivery differences

As noted above, the major difference between the two subjects was the amount of face-to-face teaching time. The RC cohort were given ten 3-hour classes spread over the 14 week semester, while the MRT cohort only received two 3-hour classes in the first week of the semester. Both cohorts were exposed to an online structure with three levels of scaffolding – weekly readings with homework, fortnightly self-tests and fortnightly quizzes. These quizzes contained an extra component of formative assessment in that the students were allowed two attempts at each quiz over a one week period, with the higher of the results being recorded as the summative assessment mark.

Furthermore, both cohorts used the discussion board to raise questions and correspond with the other students and their teacher. In addition, they both completed a 5-part scaffolded case study assignment specifically structured around their own work environment and a final examination, with all assessment items for each cohort being marked by the same academic, thus controlling for marking variability. Table 2 provides the value of each assessment component as a percentage of the overall mark for the unit.

Hypothesis development

The teacher-centred classroom approach has tended to shape Chinese learning styles (Strother, 2003). Similarly, Thompson and Ku (2005) suggested that Chinese students are used to seeing their teachers as authoritative figures, and were concerned about not getting immediate feedback in a blended

Table 2: Distribution of assessment components and identification of variables

Component	Description	%	Relevant variables
Quizzes	6 fortnightly online quizzes Total of 120 multiple choice questions	15	TESTX = no. of quizzes attempted TEST120 = total mark for quizzes (max 120)
Assignment	Stage 1 Individual component (5%) Stage 2 Group component (5%) Stage 3 Group component (30%) Stage 4 Group component (5%) Stage 5 Individual component (5%)	..50	ASSALL = total assignment mark (max 50) ASSINDIV = total for individual components (max 10) ASSGP = total for group components (max 40) GPX = no. of students in group
Final exam	Final exam 40% multiple choice questions 60% written problem questions	35	FINALALL = total mark for final exam (max 35) FINALMCQ = mark for MCQ component (max 24) FINALPROB = mark for problem component (max 36)
	Total	100	

environment, nor having sufficient face-to-face communication. However, they also postulated that an online discussion board allowing time for a considered response should be more preferable to Chinese students than spontaneous discussion in a traditional classroom. Smith *et al.* (2005) suggested that the lack of instructor guidance and a face-to-face learning community could inhibit Chinese students from participating online or using the internet to search for learning material. Chen *et al.* (2008) emphasised the fact that Chinese students perceive interpersonal relationships to be of great importance and that they expected the teacher to "enforce their learning by exercising a certain degree of control over the learning process" (p. 319). This was supported by Storper and Venables (2004) in their discussion of the four main features of face-to-face contact:

- it operates as an efficient communication technology;
- it provides trust and incentives;
- it facilitates socialisation and learning, and
- it provides psychological motivation.

Thus, many students need the face-to-face contact that is not found in "even the most sophisticated of internet offerings" (Cottrell & Robison, 2003, p. 269). Consequently, the significant difference in the face-to-face contact may certainly be influential in determining the overall performance of the two cohorts.

Based on Hofstede's (2001) cultural identification of China as a country represented by low levels of the individualism and high levels of collectivism, Mercado *et al.* (2004) suggest that Chinese students "are attuned to collective action and solutions" (p. 188) and "may be more naturally inclined towards group-based assignments" (p. 189). Similarly, Nield (2004) discovered that Chinese students liked group work because they could share the work, share their ideas, and learn from each other. Thus, the first hypothesis relates to the size of the groups selected by the two cohorts.

Hypothesis 1 (null)
There is no difference between the average selected size of the groups for the RC cohort and the average selected size of the groups for the MTRC cohort.

Hypothesis 1 (alternative)
There is a significant difference between the average selected size of the groups for the RC cohort and the average selected size of the groups for the MTRC cohort.

In order to test which of the RC and MTRC cohorts performed better in relation to group work, three different sets of data were compared for each cohort. The first data set was obtained from the average overall assignment marks, the second, from the average marks obtained in the three group work components of the assignment and the third, from the average marks obtained in the two individual components of the assignment. This resulted in the following three hypotheses:

Hypothesis 2 (null)
There is no difference between the average overall assignment mark attained for the RC cohort and the average assignment mark attained for the MTRC cohort.

Hypothesis 2 (alternative)
There is a significant difference between the average overall assignment mark attained by the RC cohort and the average assignment mark attained by the MTRC cohort.

Hypothesis 3 (null)
There is no difference between the average results achieved for group assignment components by the RC cohort and the average results achieved for group assignment components by the MTRC cohort.

Hypothesis 3 (alternative)
There is a significant difference between the average results achieved for group assignment components by the RC cohort and the average results achieved for group assignment components by the MTRC cohort.

Hypothesis 4 (null)
There is no difference between the average results achieved for individual assignment components by the RC cohort and the average results achieved for individual assignment components by the MTRC cohort.

Hypothesis 4 (alternative)
There is a significant difference between the average results achieved for individual assignment components by the RC cohort and the average results achieved individual assignment components by the MTRC cohort.

Data analysis

To test these hypotheses, data was collected in relation to students' performance in the two cohorts, in relation to the variables identified in Table 2. The descriptive statistics for these variables by cohort are shown in Table 3. The purpose of the study was to identify if there were significant differences between the behaviour and results of students undertaking the subject in the RC and MRTC cohorts. For each hypothesis, an independent samples t-test comparing the respective variable of the two cohorts was used to test the hypothesis. This test is appropriate because the independent or grouping variable is nominal (cohort = RC *vs*. MTRC) and the dependent variable in each case is scale.

Table 3: Descriptive statistics for the two cohorts

	n	Mean	Std Dev	Min	Max
RC cohort	9				
TESTX		5.89	0.33	5	6
TEST120		89.78	7.41	79	99
ASSALL		42.80	1.62	41	45
ASSINDIV		7.01	0.92	6	9
ASSGP		35.79	0.76	34	37
GPX		2.33	0.50	2	3
FINALALL		42.67	8.09	30	53
FINALMCQ		21.67	1.41	19	23
FINALPROB		21.00	8.00	9	31
MTRC cohort	15				
TESTX		5.87	0.52	4	6
TEST120		96.40	16.19	48	108
ASSALL		38.24	2.63	34	42
ASSINDIV		7.98	0.78	7	10
ASSGP		30.26	1.98	28	33
GPX		3.80	0.41	4	5
FINALALL		32.90	11.29	14	51
FINALMCQ		17.53	4.27	6	23
FINALPROB		15.37	9.943	0	31

H1: Comparing the size of the groups in which the students chose to work

All students were initially instructed to form groups of three. However, both cohorts asked for this to be modified. The RC cohort opted for smaller groups because of the ease of communication and meeting together, while the MRTC opted for the larger groups in which they had previously worked. Thus the number of students in each group was the personal preference of the cohorts. Results of the t-test are shown in Table 4. The Levene's test for equality of variances, the significance value, (p = 1.764), is greater than the threshold of 0.05, thus equal variances can be assumed.

The RC cohort had the lower average group size with an average of 1.467 (2.33 vs. 3.80) which is significant (p = 0.000). Therefore, the null hypothesis is rejected and the alternative hypothesis accepted, concluding that there is a significant difference in the average size of the assignment group for each of the two cohorts.

Table 4: Results of t-test for H1 – comparing size of assignment groups

Group Statistics

	Cohort	N	Mean	Std. Deviation	Std. Error Mean
Group size	RC	9	2.33	0.500	0.167
	MRTC	15	3.80	0.414	0.107

Independent Samples Test

	t-test for Equality of Means						
						95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Group size	-7.778	22	0.000	-1.467	-0.189	-1.858	-1.076

H2, H3, H4: Comparing the average assignment results achieved by the two cohorts

For the assignment , each student received a total mark out of 50, comprised of a total of 10 possible marks for the two individual components and a total of 40 possible marks for the three group components as shown in Table 2. Results of the t-test for each of these three average results are shown in Table 5. The Levene's test for equality of variances in relation to both the overall assignment mark and the individual components, the significance values, (p = 4.681, p = 0.729), are both greater than the threshold of 0.05, thus equal variances can be assumed. However, in the case of average mark for the group components, the significance value, (p = 0.004), is lower than the threshold of 0.05, thus equal variances cannot be assumed.

The RC cohort scored a significantly (p = 0.000) higher overall mark by an average of 4.564 or 9.1% (42.80 vs. 38.24) as well as a significantly (p = 0.000) higher mark for the group component by an average of 5.537 or 13.84% (35.79 vs. 30.26). Therefore, the null hypotheses for H3 and H5 is rejected and the alternative hypotheses accepted, concluding that the RC cohort performed significantly higher in both the average overall mark and that for the group component. However, the MTRC cohort scored a higher mark for the individual component by an average of 0.972 or 9.72% (7.98 vs. 7.01) which is also significant (p = 0.011). Hence, the null hypothesis is also rejected for H4 and the alternative hypothesis accepted, concluding that the MTRC cohort performed significantly better for the individual component.

Multiple choices questions and final examination components

Independent samples t-tests were also carried out to determine whether results achieved in multiple choice tests and final examination components were significant in relation to each cohort. The significance levels for the number of quizzes attempted, the average number of questions correct and the average mark scored for the problem component of the final examination were consistent with the null hypotheses, which meant they could not be rejected. However, the MTRC cohort scored a individual component mark in the final examination that was higher by an average of 4.133 or 17.2% (17.53 vs. 21.67) which is significant (p = 0.000) and a higher mark for the group component by an average of 5.537 or 13.84% (35.79 vs. 30.26) which is significant (p = 0.011), indicating that the MTRC cohort performed significantly better than the RC cohort on the multiple choice questions in the examination, despite the

fact that there were no significant differences in performance on the quizzes which were drawn from the same database.

Table 5: Results of t-test for H2, H3, H4 – comparing average assignment results

Group Statistics

	Cohort	N	Mean	Std. Deviation	Std. Error Mean
Overall mark	RC	9	42.80	1.621	0.540
	MRTC	15	38.24	2.630	0.678
Individual component	RC	9	7.01	0.921	0.307
	MRTC	15	7.98	0.779	0.201
Group component	RC	9	35.79	0.764	0.255
	MRTC	15	30.26	1.983	0.512

Independent Samples Test

	t-test for Equality of Means						
						95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Overall mark	4.681	22	0.000	4.564	0.975	2.542	6.586
Individual component	-2.766	22	0.011	-0.972	0.352	-1.701	-0.243
Group component	9.682	19.68	0.000	5.537	0.572	4.342	6.731

Discussion

The study reveals that Australian students performed significantly better than Hong Kong students when both cohorts were exposed to the study of the same accounting subject in a blended learning environment with the major difference being the amount of face-to-face contact with the teacher. The literature asserts that Chinese learners are raised to respect teachers who provide them with knowledge (Chan, 1999) and that they consider these teachers as more knowledgeable than do their Western counterparts (Zhao & McDougall, 2008). Nield (2004) suggested that the teaching style in Hong Kong is both teacher-centred and didactic, and that qualities of empathy and friendship are highly prized. This sort of relationship is difficult to build with a just a short visit and the remainder of the contact online. The lower results for the cohort with limited exposure to the academic may be the result of one of key requirements of Chinese learners: that teachers are integral to the learning process by both disseminating information and by enforcing learning.

There appear to be mixed messages presented in relation to working in groups and group sizes. Although the Chinese students chose to work in larger groups, their best results were achieved in the individual components of the assignment rather than the group components. This may be explained by the findings of Ku and Lohr (2003) that Chinese students preferred to work within a small group for feedback purposes, but preferred to work on projects individually, rather than in groups.

The results also showed that the Chinese students performed significantly better than the Australian cohort in the multiple choice questions in the final exam. This could be a consequence of the Chinese students' propensity to be strategic learners (Nield, 2007; Ramburath & McCormick, 2001) who take an achieving approach to their study (Biggs, 1987). This leads Hong Kong students to read and complete exercises on which they would be formally assessed (Nield, 2007), and thus, may account for the Chinese cohort's significantly better results in the multiple choice section of the final examination. Since they knew there would be multiple choice questions and they had examples from the quizzes and self-tests during the semester, it would be strategic to study the given multiple choice questions to help prepare for the final examination.

While it is difficult to build relationships at a distance, this can be somewhat overcome through the use of other methods of communication, such as weblogs, podcasts, video-streaming and Skype. However, it is not appropriate merely to add more technology, but rather to provide a balanced blended approach aimed at facilitating better communications between students (Aspden & Helm, 2004). Indeed, Chinese students

rarely enjoy units that are offered completely online (Thompson & Ku, 2005). Consequently, socialisation strategies for electronic communication need to be developed in order to enable Chinese students to participate effectively (Smith *et al*., 2005).

Ultimately "to handle any group of students from a different culture, it is ideal to create a flexible program structure" (Stother, 2005, p.246). This flexibility will provide teachers with a variety of activities, from which they needs to select those that best meet the needs of the cohort, remembering that the single factor that motivates students the most is assessment (Gerbic, 2005, 246). As so many tertiary offerings now cross the cultural divide, it is essential that the design and planning stages should be based on fully integrated cultural conditions.

Conclusion and future directions

This study explored the outcomes that arose when an accounting subject was offered in a blended delivery mode to two similar cohorts of students, one in Australia and the other in Hong Kong. This study will help both students and academics to become aware of the cultural differences that may be encountered in offering a blended mode of an accounting subject in a cross-cultural context. This awareness will assist students to understand how they can enhance their performance, and help academics to design subjects with the appropriate blend of ingredients to facilitate improved student learning.

The differences in the results between the two cohorts indicate that the recipe for success in a cross-cultural context does not depend merely on the list of ingredients, but also on the amount of each which is stirred together to create the final product. This mix must recognise both cultural preferences and dissimilarities, and be designed to enhance students' preferred learning styles. Special consideration should be given to the amount of face-to-face time to which students are exposed as this appears to be the major difference in the delivery structure that significantly affected the outcomes. Given the importance of academic-student contact, together with the financial pressures faced by most institutions offering offshore courses, it is necessary to consider other ways to enhance academic and student interaction through face-to-face means that do not necessarily require simultaneous presence in the same physical space. Thus, future studies need to consider situations using such alternative technologies in cross-cultural contexts, and the appropriate mix of ingredients necessary to obtain the best results.

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