The Importance of Online Community in Student Academic Performance

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Abstract: This study sought to investigate four separate issues regarding student performance in a blended learning environment in the delivery of a Psychology course to 140 University undergraduates. Firstly, to investigate the relationship between student performance on three different coursework assignments and their performance on interim online assessments. Secondly, to investigate the relationship between student performance on coursework assignments and their perceptions of online community. Thirdly, to investigate the relationship between students' online community scores and their engagement with an online assessment. Finally, to look at the relationship between students' cognitive information processing style and coursework performance. The findings revealed that student coursework performance was positively related to their engagement with the online assessments. Furthermore, student online community scores were related to their coursework performance as was cognitive style. The results are discussed in terms of a consideration of these three factors in course design within a blended learning framework.

Keywords: Community, cognitive style, interim assessment

1. Introduction

The initial rationale underpinning the use of an interim online assessment system is to monitor and identify, early on in a course, those students who appear to not understand the course material. The most expedient way to achieve this is through the use of online multiple-choice tests (MCQs). Students obtaining low scores here can then be offered additional help and instruction. Furthermore, such a system could also be useful as a way of identifying students who are failing to attend classes, or students who are attending classes less regularly than other students.

One further possible reason for student success or failure on a particular course is the degree to which these students engage with that course and with the other students on the course. This sense of engagement between learners is referred to as sense of classroom community. Rovai (2002) offers an explanation of sense of classroom community as being mutual interdependence and a sense of trust and interaction among community members. This means that the members of the community have shared goals and values. Online community needs to be thought of in terms of the activities people perform together in their group and not physically where they perform such activities. There are four components of classroom community outlined by Rovai (2001) and these are described as follows. Firstly, 'spirit' which is the feeling of belonging to and acceptance of a group identity. This refers to the recognition of membership of a community and the feelings of cohesion that develop amongst learners in a group as a result of this. Secondly, 'trust' is simply the feeling that the group can be trusted and the group members will give feedback to each other. Once this is established, members of the group or community can speak with confidence to other members of the group. Thirdly, 'interaction' is the feeling that community members have that they may benefit by interacting with other members of the community. Finally, 'learning' is the sense that community members have that learning can come about due to the community discussing information, that is, the community can construct knowledge. In a typical online environment group members may engage in interactive behaviour such as discussion, exchange of ideas and seeking advice.

1.1 Community

There is a body of evidence that would argue in favour of the importance of a sense of community in learning. For example, Wang (2001) argues that community can also result from shared knowledge among learners in an online environment, and the evidence suggests that interaction between learners in online courses could be of great importance to learner success (e.g. Shale and Garrison, 1990). Indeed, Citera (1998), suggests that online discussions encourage more reticent individuals to participate to a greater extent, while Warschauer (1997) advocates interaction in online environments, where there is less opportunity for intimidation between individuals and, in asynchronous settings, less time pressure than in face-to-face interactions. However, the lack of a sense of close interaction between learners in an online environment may have adverse consequences, which may be because learners experience feelings of isolation. Haythornthwaite, Kazmer, Robbins and Shoemaker (2000), suggested that

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the participants in their study who failed to make online connections with other learners in their group reported feeling isolated and more stressed than those who made more connections. It would seem therefore that a strong sense of community and interaction is also crucial in online learning environments.

1.2 Individual differences

Although the studies cited above indicate the extent to which sense of community is necessary for effective learning in both face-to-face and online environments, it is pertinent to recognise that individual difference factors have also been shown to have an effect on sense of classroom community. For example, Rovai (2002) has demonstrated that there are differences in sense of classroom community between males and females, with females reporting a greater sense of community, and Kim and Bonk (2002) have demonstrated differences in sense of community cross-culturally, with students from the USA displaying a greater sense of community than those from Finland. Recently, Graff (2003) has provided some evidence to suggest that sense of classroom community is related to an individual's learning style, with those possessing a globally orientated, socially dependent learning style reporting a lower sense of community than those possessing an analytic less socially dependent style. Accordingly, it is also possible that the way in which a student learns, may be identified by an assessment of individual difference factors, and one of the most profitable areas in this case is the notion of cognitive style.

1.3 Research questions

Four specific research questions were tested here. Firstly, what is the relationship between performance on coursework assignments and performance on interim online assessment? Secondly, is there a relationship between performance on assignments and classroom community scores? Thirdly, what is the relationship between classroom community scores and MCQ engagement? Finally, what is the relationship between cognitive style and coursework performance?

2. Method

2.1 Participants

Participants in this study were 140 first year undergraduate students. These were 25 males and 115 females ranging in age from 18 to 54 with a mean of 23.15 and an SD of 8.11.

2.2 Assessment methods

2.2.1 Online multiple choice questions

After each lecture, students were required to attempt several online multiple-choice questions based on the content of the lecture. The questions were posted on Blackboard, an example of which is shown in Figure 1 below. Correct responses to the multiple-choice questions yielded a normal distribution.

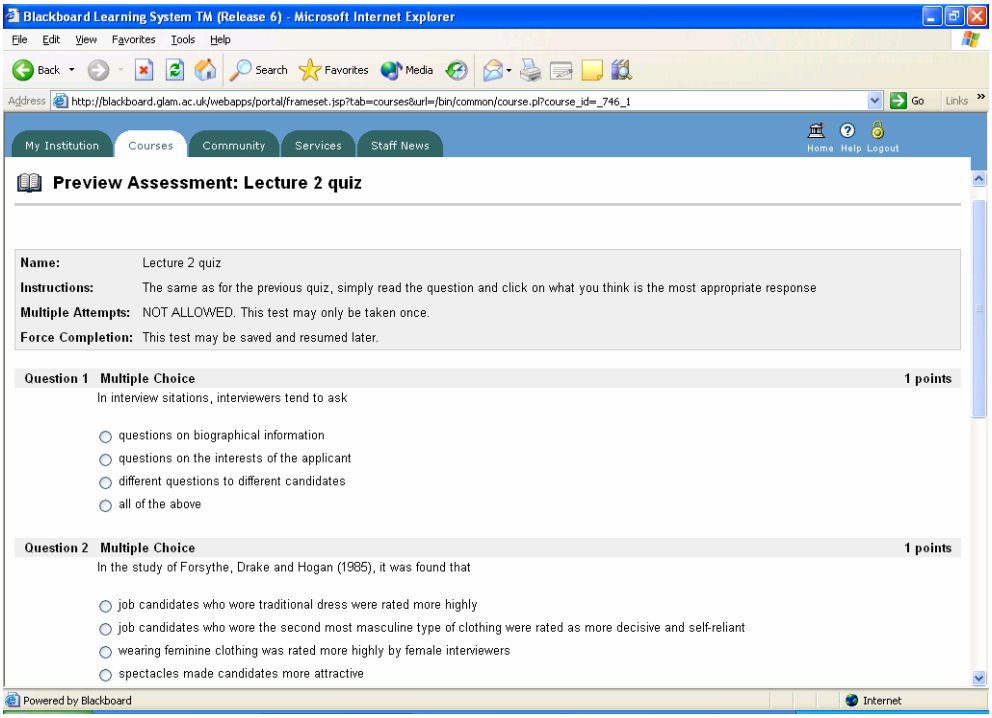

Figure 1: Example multiple-choice questions

2.2.2 Coursework assignments

Three different types of assessment were utilised in this course. Theses were:

1. A short essay 800 words.
2. A critical evaluation of a psychology article. For this, students had to choose an article and write about the psychological implications of the article's content from their knowledge of psychology. This was not meant to be an essay, but merely a commentary.
3. A long essay 1500 words.

2.3 Psychometric instruments

2.3.1 Cognitive styles index (Allinson and Hayes 1996)

The Cognitive Styles Index (CSI) (Allinson and Hayes 1996) is a self-report test designed to measure the analyst-intuitive dimension of cognitive style. The term intuitive is used to describe an individual who makes judgements based on feelings and who adopts a global approach to processing information, whereas the term analytic describes an individual who makes judgements based on reason, and who focuses on specific detail when processing information. Analysts tend to be inward looking and self-reliant, whereas intuitives are more socially directed orientation and look more to others. The CSI contains 38 statements, to each of which a respondent must indicate a true/uncertain/false response. It has a theoretical maximum score of 76. Higher scores indicate a more analytical cognitive style and lower scores indicate a more intuitive style.

The psychometric properties of the CSI instrument are documented by Allinson and Hayes (1996). From a sample of 1000 participants, they report a mean score of 38.5. Furthermore, graphical inspection and a Kolmogorov-Smirnov 'goodness of fit' test suggest that the test scores are normally distributed. Test-retest reliability of the instrument is also sound ($r = 0.90$, $p < 0.001$), and mean scores of 34.60 and 35.40 indicate no significant changes over time ($t = 0.82$, $p > 0.05$). Finally, internal consistency scores measured by Cronbach's Alpha taken from seven independent samples range from .84 to .92. The construct validity of the CSI has also been reported by Allinson and Hayes (1996). They report statistically significant relationships between the CSI and scores on the Myers Briggs Type indicator. For example, the CSI correlated positively with the extroversion – introversion ($r = 0.57$, $p < 0.001$), dimension and correlated negatively with the sensing - intuitive ($r = - 0.41$, $p < 0.05$) and judgement - perception ($r = - 0.41$, $p < 0.01$) dimensions of this instrument.

2.3.2 Classroom community index (Rovai, 2002)

The Classroom Community Index is a self-report instrument consisting of 40 items, requiring a response on a 5-point Likert-scale ranging from strongly agree to strongly disagree. Scores on the questionnaire range from 0 – 160, with low scores reflecting a weak sense of community and high scores reflecting a strong one. The questionnaire also features four subscales of spirit, trust, interaction and learning with 10 items measuring each and scores ranging from 0 to 40. Rovai (2002) reports a high degree of face validity of the instrument, in that the items appear to measure what is needed to assess community. Internal consistency estimates using Cronbach's alpha as reported by Rovai (2001) reached .96 for the total scale, .90 for the spirit subscale, .84 for the trust subscale, .84 for the interaction subscale and .88 for the learning subscale.

3. Results

3.1 The relationship between performance on coursework assignments and performance on the MCQs

Clearly students who had attempted more of the MCQs would have scored more than those who attempted less. Therefore for the purpose of data analysis, the mean and not total MCQ scores were used, and placed in the following categories. MCQ scores of between 1 and 3.4 were assigned to category 1, scores between 3.5 and 3.9 were assigned to category 2 and scores between 4 and 5 were assigned to category 3. This system of data analysis ensured that each category contained approximately 30% of participants. A one-way analysis of variance was performed on each assignment score and the mean assignment score for each MCQ category. However, no significant effects were observed.

3.2 The relationship between performance on coursework assignments and engagement with the MCQs

The analysis above illustrates that performance on coursework assignments was not related to mean performance on the MCQs, and the next part of the analysis assesses whether engagement, that is the number of MCQ tests attempted by participants was related to

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performance on their coursework assignments. The MCQs were set after each of a series of six lectures and therefore students could have attempted anything between 0 and 6 MCQs. A one-way analysis of variance was performed on each assignment score for the number of MCQs attempted. A significant effect was evident only for coursework assignment three (F, (82, 5) = 2.49, p = 0.04). Figure 2.shows coursework assignment scores for each MCQ category for assignment 3 and illustrates that those who attempted 4 or more MCQs scored higher on coursework assignment 3, whereas those who attempted 3 or less scored lower on coursework assignment 3.

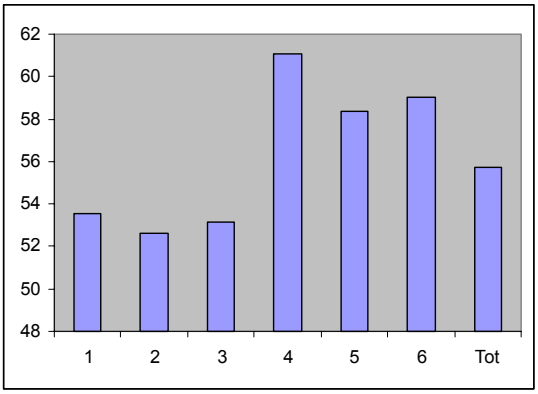

Figure 2: Scores on coursework assignment 3 and MCQs attempted

3.2.1 The relationship between performance on coursework assignments and classroom community scores

In order to investigate the relationship between coursework assignments and classroom community scores, the community scores were subdivided into three categories, low community scores (category 1), medium community scores (category 2) and high community scores (category 3). A one-way analysis of variance was performed for coursework assignment scores for each category of the classroom community questionnaire, (that is high, medium and low). An effect approaching significance was observed for the spirit subcategory of the community scale and only for assignment 3, (F (2, 72) = 2.63, p = 0.07). This is illustrated graphically in Figure 3. No significant effects were observed for coursework assignment scores for any of the other community categories.

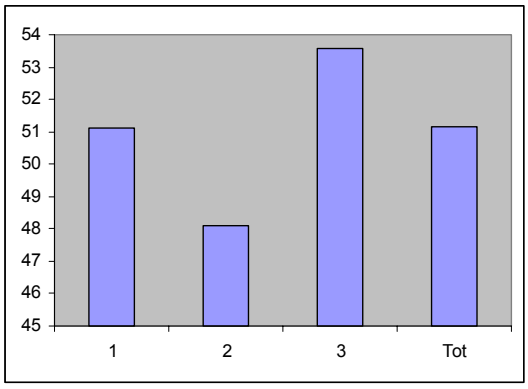

Figure 3: Scores on coursework assignment 3 and Spirit Category

3.3 The relationship between community scores and MCQ engagement

The third research question looked at the relationship between community scores and MCQ engagement. A one-way analysis of variance was performed on the community scores for each category of MCQ engagement as outlined above. However, no significant effects were observed for MCQ engagement and community scores.

3.4 The relationship between cognitive style and performance

The final research question centred on an analysis of the relationship between cognitive style and coursework performance. For the purpose of data analysis in this study, cognitive style was divided into three categories. A one-way analysis of variance was carried out, and revealed a significant effect between coursework performance and cognitive style, only for coursework assignment 3 (F (2, 36) = 3.67, p = 0.03). In this case, analytics scored highest. This is shown in more specifically in Figure 4.

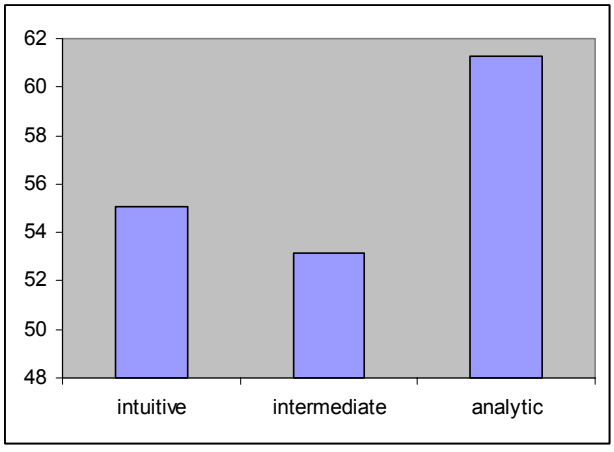

Figure 4: Scores on coursework assignment 3 and cognitive style category

4. Discussion

This study sought to investigate several issues related to interim assessment and the results are discussed in the following. Firstly the results showed no relationship between performance on the coursework assignments and performance on the online MCQs. The MCQ categories were very narrow and this may account for the lack of any observable differences here. What is possibly more critical is the relationship between performance on the coursework assignments and engagement with the MCQ system. Here the results showed a difference in that students who attempted 4 or more of the six MCQ tests scored better on assignment 3 than those who attempted 3 or less MCQs. This would appear to suggest that students who perhaps engaged more with the course generally were likely to perform better in coursework. Why this is only true for coursework 3 is possibly because this coursework was a more substantial piece of work than the first two.

This study also sought to look at the concept of classroom community, and the relationship between this and performance on coursework assignments. The results showed that students with a high spirit score on the community index performed better on coursework assignment 3. As described above, 'spirit' is the feeling of belonging to and acceptance of a group identity. This refers to the recognition of membership of a community and the feelings of cohesion that develops amongst learners in a group as a result of this. It appears then that a feeling of belonging to a group is essential for good performance. However, there would appear to be no relationship between classroom community scores and MCQ engagement. In line with studies, which show a relationship between cognitive style and academic performance, this study also illustrated such a relationship. Here analytics as defined by the Cognitive Styles Index performed best on assignment 3, with no difference in performance between learners of different cognitive styles in the other coursework elements. The consistent finding here is for a difference to be evident on assignment 3. As mentioned above, assignment 3 was a more substantial piece of work, and this may account for the difference observed here. A further possible interpretation is that differences in ability between students were beginning to become evident at the time they took the third assignment. However, it also possible that assignment 3 was an assignment, which differentiated between students on ability, and this, is something, which is worthy of further investigation.

5. Conclusion

In conclusion, the general finding from this study showed several factors determined good performance on coursework assignments. These were engagement with the course in terms of the amount of online assessment attempted, classroom community, and cognitive style. It would therefore seem reasonable to consider these factors in the design of course material.

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