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# **Evaluation of different methods of on-line collaboration/group work supported within a virtual learning environment (VLE)**

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The aim of this study was to discern whether the different methods of online collaboration/group work could be used to encourage independent (of the tutor) and effective student learning as perceived by the student group. Specific objectives for the study were to identify strengths and weaknesses in the structure of the different methods of on-line collaboration/group work; identify direct-entry and mature students' perceptions of effective learning associated with the delivery of the different on-line collaboration/group work methods; identify potential barriers associated with online collaboration/group work.

Evaluation of the study was undertaken by questionnaire following the completion of each piece of coursework, asking students to identify their usage of the virtual-learning environment (VLE) and express opinions regarding the effectiveness, strengths and weaknesses associated with each method. The paper includes descriptive analysis of the data and personal reflection from the tutor.

**Keywords** Collaborative Learning

## **1. Collaborative Learning**

Advantages associated with collaborative learning have been well documented. It is now increasingly accepted that the most important outcomes of education and training are about developing people, and not just what people know or understand [1]. There has been considerable pedagogic research into collaborative learning and it has been shown to contribute to the graduate skills of “teamwork, communication, lifelong learning and problem-solving” [2]. With advances in our understanding of learning, educators now place greater emphasis on collaborative learning and the development of participatory learning communities to promote the social construction of knowledge [3]. Social constructivism—one of the two main approaches within the constructivist view of learning—focuses on the sociocultural context in which knowledge is built [4]. Paulus [5] further refined the definition to emphasize the negotiation of meaning and construction of shared understandings through dialogue. This supports the work of Bandura [6] who stated that interaction and dialogue are key components of learning according to social learning theory.

There is, however, limited research in using this approach in a blended learning environment [7].

The aim of the project was to discern whether different methods of collaboration/group work, supported by a virtual learning environment (VLE), could be used to encourage independent and effective learning, as perceived by the student group, during the delivery of an undergraduate, level 3 module.

Specific objectives for the project were to: identify student perceptions of effective learning associated with the delivery of different types of collaboration/group work tasks; identify strengths and weaknesses in the structure of the different types of collaboration/group work tasks; and identify potential barriers associated with the collaboration/group work tasks.

## **2. Structure of the module and collaboration/group work tasks**

The project was undertaken in a module called “Comparative Imaging”. This is an undergraduate, level 3 module forming part of a BSc (Hons) Diagnostic Radiography and Imaging programme.

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Assessment of learning within the module consists of a two hour unseen examination and 3,000 word equivalent coursework, each of which are weighted at 50%. The coursework assessment within the module consisted of three collaboration/group work assignments. The structure of the coursework tasks are outlined below.

### 2.1 Coursework 1

Following the delivery of a key lecture to all students, students were directed to explore the topic and to upload a link to a relevant electronic article to the VLE. The links were to be uploaded by a deadline date, and were to be accompanied by a 200 word article summary.

Students had to submit an individually written report on an application of their chosen modality based upon three of the uploaded articles from different modality groups.

### 2.2 Coursework 2

Students were asked to form groups of 5-6 members, of their own choosing, and to notify the module leader by a fixed date. Individual group sites were then created for each group. Students were asked to consider different working practices in different imaging areas. Students were asked to assign tasks amongst themselves and to submit a written group report based on their work.

### 2.3 Coursework 3

Students were placed in groups of 6-8 and group sites were created for each group. Students were given the task of critically evaluating a specialist website from a given list. Individual tasks were assigned and each group was required to submit a group written report.

## 3. Assessing Group work participation

In addition to the group written reports for coursework 2 and coursework 3, students were required to submit a “self and peer participation evaluation form” in order to recognise the participation and contribution of the individual group members, and to formulate individual coursework marks. This was based on the “Sparks” system [8].

## 4. Evaluation

The student group consisted of 84 students. The student group is ethnically diverse and also has a wide age range, with approximately 50% of the group being mature students. Because of this, it was felt that it be useful to make comparisons between direct entry student and mature entry student responses, to see whether there were differences in perception.

Following each assignment, students were given a questionnaire asking them to identify whether or not their group accessed the virtual learning environment (VLE) in order to complete the coursework (this question was not applicable for coursework 1, as students worked individually, and could not complete the task without accessing the VLE), and how many times they individually accessed it in order to complete the task. They were also given two statements and were asked to identify on a likert scale of 1 to 5 how strongly they agreed or disagreed with them. The statements were:

- i) In my opinion, the process of doing “coursework (1, 2 and 3)” encouraged me to learn independently.
- ii) In my opinion, the process of doing “coursework 1, 2 and 3)” contributed effectively to my learning.

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Students were also asked open questions about the strengths/good points and weaknesses/difficulties with each piece of coursework.

The third and final questionnaire also asked the students to rank the coursework tasks in order of preference.

## **5. Results and discussion**

### **5.1 Did your group work together using the VLE to complete the coursework?**

This question did not apply to Coursework 1, as students worked individually and could not complete the coursework task without accessing the VLE. The mature students demonstrated a more consistent approach in the use of the VLE (80% for coursework 2, and 90% for coursework 3 indicating that their groups used the VLE) than did the direct entry students (43% for coursework 2, and 93% for coursework 3). Indeed, for coursework 2, a greater percentage of direct entry students (57%) indicated that their group did not use the VLE in order to complete coursework 2 than did use it (43%).

A Possible reason for this might be the geographical spread of the student population. The student population does come from a very large geographic area. For coursework 2, students were able to choose who they worked with. It is possible, with many direct entry students living on campus that they may have chosen their groups from those with whom they share a house, or who live in the same halls of residence. It would therefore be more possible for the direct entry students to complete the coursework 2 assignment through face-to-face meetings rather than through use of the VLE. The mature entry students are more geographically separated by distance, and so therefore might feel a greater need to complete the coursework through the group sites on the VLE. This could also lead on to the suggestion that if there is not a specific need to use the VLE in order to complete assignments, then students may be less likely to engage with it. This could also explain why use of the VLE increased for coursework 3, where students were placed into groups. The geographical separation may have increased the need to work together using the VLE.

### **5.2 How many times did you access the VLE in order to complete the coursework?**

Coursework 1 encouraged greatest use of the VLE, followed by coursework 3. Coursework 2 Encouraged the least use of the VLE.

Generally speaking, the mature students accessed the VLE a greater number of times in order to complete each of the coursework assignments than did the direct entry students. This may be due to geographical location of the students as previously mentioned. It might also be due to mature entry students accessing the coursework question discussion forum more frequently than direct entry students in order to seek clarification of purpose. For both direct entry and mature students, coursework 2 resulted in the least use of the VLE.

### **5.3 “In my opinion, the process of doing the coursework encouraged me to learn independently”**

Overall, for both groups, there is more agreement with the statement than disagreement. Coursework 1 produced the highest the highest level of agreement (70% of direct entry students either agreed or strongly agreed with the statement, and 73% of mature students either agreed or strongly agreed with it). Coursework 1 involved students working individually and submitting an individual assignment. The

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assignment could not have been completed, however, without reference to other student's uploaded articles. Some of the strengths of this piece of coursework, as identified by the students comments are reproduced below:

- "Interesting and useful task. Beneficial to learning";
- "Being able to learn and gather information independently";
- "Learning to upload and pick important bits from all articles".

Coursework 1 was a challenging task for the students. They were not given an essay title, but were given an outline of what was to be done and what was expected of them. They had the responsibility of creating links within the uploaded articles in order to complete the written assignment. For many students, this created initial confusion and uncertainty. From the tutor's reflective journal which was kept throughout the period of running the module, the following extract illustrates the situation as it was within the first couple of weeks:

"I think the structure of the module has confused the students a bit. I think they were initially a bit stunned by what was involved. The first couple of weeks for me have been frantic, trying to keep up with the number of worried e-mails. Towards the end of week 2, suddenly all the worried e-mails ceased. Students started to get organised and began to upload articles".

This view is supported by the students' comments, some of which are reproduced below:

- "There was a bit of confusion to what actually had to be done. The whole class was up in arms for about 2 weeks with confusion";
- "Really understanding what to do to begin with. Found it difficult to get started, motivation".

Coursework 2 produced the greatest difference of opinion between the direct entry and mature student groups. Here 64% of mature students either agreed or strongly agreed with the statement as compared to 39% of direct entry students either agreeing or strongly agreeing with it. The reasons for these results are not clear. It might be due to uncertainties or differences in perception of what constitutes independent learning. Alternatively, the results might be a reflection of individual preferences of different learning tasks.

A higher percentage of direct entry students (52%) either agreed or strongly agreed with the statement for coursework 3, as compared with 39% of direct entry students who agreed or strongly agreed with the statement for coursework 2. One explanation for this could be that where the students were given individual tasks to do for coursework 3, they perceived this as encouraging their independent learning, whereas for coursework 2 individual tasks were not assigned. The opposite might be said for the mature students. For coursework 3, only 35% of mature students either agreed or strongly agreed with the statement as compared with 64% of mature students either agreeing or strongly agreeing with the statement for coursework 2. Is it possible that the mature students perceived the fact that they were assigned individual tasks for coursework 3 as limiting, or curtailing, their independent learning?

5.4 "In my opinion, the process of doing the coursework contributed effectively to my learning"

For coursework 1, there is strong agreement between the direct entry and mature students regarding the effective contribution to their learning (63.3% of direct entry students either agreed or strongly agreed with the statement, and 77% of mature students either agreed or strongly agreed with it).

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For coursework 2, a higher percentage of direct entry students were in agreement with the statement than mature students (69% of direct entry students either agreed or strongly agreed with the statement, and 56% of mature students either agreed or strongly agreed with it).

A slightly higher percentage of direct entry students considered coursework 2 to contribute more effectively to their learning than coursework 1. A possible reason for this might be due to the nature of coursework 2, which was rooted in clinical practice, and therefore seen as more valuable by some students. Also for some students, the comfort of working with friends may have been a factor.

For coursework 3, The highest response from both the direct entry and mature student groups was the “not sure” category. Coursework 3 produced the least agreement with the statement (24% of direct entry students either agreed or strongly agreed with the statement, and 29% of mature students either agreed or strongly agreed with it). It might be possible that the reason for this was the result of being placed in groups not of the students own choosing. This view is supported by students’ comments, many of whom reported difficulties in working with group members. No conflict was, however, reported to the tutor. Some sample comments are reproduced below:

- “Some members didn’t show much interest and produced rather average work”;
- “I found being put in a group of people I didn’t choose delayed the time in completing the project”;
- “Personality conflict- working with some others who did not place much importance on the task”.

The students view is not all negative, however. Some students mentioned working with others that they did not know, and being allocated tasks by the tutor as strengths of coursework 3.

#### 5.5 Students preferred method of coursework

On the final questionnaire, students were asked to rank the three coursework methods in order of preference.

Although each type of coursework produced 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> choices, the overall ranking of preference for both the direct entry students and mature students was the same. Coursework 1 was ranked most highly followed by coursework 2 and coursework 3. Reasons for this result might be that students preferred the independence of studying and submitting work individually over both forms of group work. Also, when students worked in groups they may have preferred choosing and working with friends above being placed into groups by the tutor. Also, the nature of the coursework tasks should be taken into account.

The third piece of coursework, although not rated highly in terms of independent learning and effective learning by the students, did result in greater use of the VLE than coursework 2. The task process of coursework 3 is a similar situation that will be encountered by the students when qualified and working in clinical imaging departments. They will be expected to work in multi-professional teams where they do not necessarily know all members and would be expected to achieve tasks and goals effectively. The challenge for the teaching team is therefore to foster a greater value on group work and team work amongst students, and create a framework within which it can be accomplished.

## 6. Summary and Conclusions

The VLE was able to support the different methods of group work, providing a range of group working features, which were used by the student groups. Throughout the project, the mature students demonstrated a more consistent approach to using the VLE than the direct entry students.

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When placed in groups not of their own choosing, the use of the VLE increased, when compared with students working in chosen friendship groups. This may have been due to the geographical location of the students. The student population is spread over a wide geographical area. It may have been due to the fact that students may have felt less able, or inclined, to use the VLE when working with their friends – opting instead for face-to-face communication. When working with students not from their friendship groups, they may have felt greater pressure to participate in the use of the VLE.

To maximise use of the VLE for coursework it, placing students in groups not of their own choosing and structuring individual tasks to reduce conflict could be beneficial. Uploading resources to the VLE to support coursework would also encourage students to make greater use of the VLE. Making the coursework tasks directly relevant to the students' learning and clinical practice will hopefully encourage them to appreciate the benefits of independent learning and the effective contribution that group work/collaboration can make to their learning.

Other factors worth taking into account are the need to allow sufficient time for collaborative learning tasks online. Groups need time to socialise and organise themselves prior to undertaking the coursework tasks. This is particularly so where members have been randomly assigned to groups. Also, it is important to have a sufficient word count associated with the coursework assignments to enable the coursework task to be fully explored and written in depth.

For this project, group working skills, and roles were not taught or discussed with the students in advance. Similarly, attempting to place students in groups based upon Belbin roles or Myers Briggs types was not attempted. It is unclear whether this would have had any impact on the process.

The students preferred method of assessment was the individually submitted assignment. There is a challenge here for staff to foster a greater value on group work and team work amongst students.

## 7. Acknowledgements

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