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The Teacher's Role in Promoting Online Peer Group Learning

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ABSTRACT

Teachers have a major responsibility to engage students online for successful learning in online distance education programs. Identifying key aspects of the teachers' role is important. The study reported in this paper investigated an online course for paramedic students. Data were collected from the teachers and students and their online interactions were observed. The study has shown that students' message posting is likely to be related to the cognitive demand and accessibility of discussion tasks that staff design and the quality of teacher facilitation of discussion.

Keywords: *online learning, teacher's role, ICT, LMS*

1. INTRODUCTION

The teacher's role in both face-to-face and distance education supported by computer mediated communication appears to be a crucial aspect of students' learning. With the development and use of Information and Communication Technologies (ICT) in distance education in recent years, researchers have pointed out several aspects of teachers' support such as mediating learning materials for students [5], designing discussion tasks [32], facilitating peer interaction by providing feedback and guidance [31], providing scaffolding [35]; [17], formulation of new pedagogy [37], and importance of instructional design for student engagement [39]. The main focus is on the need for student interaction, in order to overcome their isolation that they may feel in a distance setting and for knowledge construction through peer group interaction. Peer group interaction in an online environment and the strategies that e-moderators are required to adapt is an important aspect of learning [36].

In the field of online learning, research studies have been conducted on students' interaction [1]; [9]; [27], students' satisfaction [13]; [2]; [33], and content analysis of students' messages [7]. Some researchers have also reported that teachers' feedback was useful for students' online interaction [25]. Let us look at the recent study regarding teacher's role. Oliver [34] pointed out that research conducted by teachers of eLearning has increased our understanding of pedagogy. Deepwell and Malik [10] found various kinds of assistance expected by students from tutors in a technology supported learning. Some researchers have identified success factors in online learning such as Instructional support for staff [4], interactivity [26], learner confidence and teacher presence and involvement [29], relevant learning resources and timely feedback by teachers [42], and pedagogic and leadership aspects [6]. However, the teachers' role in getting students to interact online and strategies to support their learning online through interaction are still unclear. In this paper the way that teachers create opportunities for interaction and support students' online interaction, and the success of these strategies in relation to students'

participation in discussion online is investigated. Relevant literature is discussed initially.

2. LITERATURE REVIEW

In education and training a range of Learning Management System (LMS) such as WebCT and TopClass, Moodle, bulletin boards and social networking resources such as Wikis [11]; [28] are being used to offer courses online via the Internet. Each of the LMS has different facilities and functions for teachers and students that create interaction opportunities for all participants who belong to a particular teaching learning community. In this online situation the role of teacher is indirect. By posting textual messages in a particular online discussion area of a course the teacher may facilitate interaction between students. The technology or the teacher can support and stimulate students' activities [21] that engage them in thinking, understanding the instructions and presenting ideas intellectually about the topic or the task [22].

From the theoretical point of view, teaching is a process of helping students to construct their knowledge using their experience and providing guidance in their meaning making process [21]. The constructivist notion of generative learning strategies supports the teacher's role as a guide in a learning environment to enable discovery by the students [3]. So from this perspective the teacher's role is to guide students to generate their own questions, interpretations, and reflections when listening to the other members of the student's group. Technology-mediated learning offers teachers the opportunity to create an environment of learning that enables students to discuss the task and acquire skills through reflection on the task and evaluation of students' messages [15]. The teacher can employ strategies such as encourage students to email each other, and participate in a threaded discussion or a chat group to enhance their knowledge on the topics [23]. Harasim [15] suggested that the teacher plays a background role by observing interaction and progress, offering guidance, encouraging presentation and providing feedback where necessary. Jonassen and his colleagues

[21] argued that the teacher's role is to promote ideas or views and provide suggestions in appropriate ways so that the students can understand the topic as a whole. Researchers like Harasim, Hiltz, Teles, and Turoff [16] emphasised some important jobs for instructors in online learning. These were (i) providing clear directions on the structure of the technological system (ii) creating a warm, welcoming and supportive environment at the start of the course to begin participation and (iii) observing peer group participation.

For an online course Makrakis [31] categorized the teacher's instructional role as a reflective practitioner, as a facilitator, and as a scaffolder. In the teacher's role as facilitator the aim is to have learners regard each other as learning resources rather than as competitors who depend solely on the teacher as an instructor and leader of the group. However, she did not provide a clear explanation of the teacher's role as a scaffolder. Salmon [35] pointed out several responsibilities and competencies of e-moderators (teachers) who wish to offer their courses online. These were: (i) ability to develop and enable all members in the class, (ii) act as a catalyst and foster discussion, (iii) summarise, restate and challenge, and (iv) monitor understanding and provide feedback. She also highlighted that the teachers should know when to control groups, how to bring in non-participants and how to pace discussion. Deepwell and Malik [10] summarised the nature of university students' expectations from lecturers in a technology supported learning situation. Students' expectations included guidance on weekly activities, instantaneous feedback for tackling academic work, resource materials, course information, and directions from teachers on what and how to use technology for learning independently. Referring to previous studies Sharpe [39] pointed out that good instructional design can encourage cognitive engagement. He also added that examples and illustrations in the lecture materials are important for student engagement in online task. Sharpe did not present details of the studies reviewed.

Liu [24] used two face-to-face sessions and guided and facilitated students' online interactions to support their online collaboration on group projects. Liu showed that in an online learning environment knowledge construction may happen through peer group interaction and that the teacher's role in planning the interaction and managing discussion is a crucial aspect for students' knowledge construction. Bekele [6] identified a range of success factors in internet supported learning environment. Some of these factors are collaborative, interactive, feedback oriented, problem-based, learner centered and student and teacher satisfaction.

In general studies have reported lower than expected levels of student participation in online discussion [13]; [14]; [41]. Furthermore, Xie, and Ke [43] found low participation in higher education because of some factors such as perceived values, and competence of students. Studies have reported higher levels of interaction that is question, answer and feedback, between learners,

than between learners and instructors [1] and that online discussion enhanced students' understanding of the subject matter as reported by the participating students [13]; [30]. Gunawardena, Plass, and Salisbury [14] thought that priority must be given to taking into account student characteristics, and the structure of the content or the discussion questions. The researchers did not analyse the discussion tasks or the frequency of student messages.

In summary, many authors and researchers have pointed out various aspects of teachers' support including expectation of students from teachers and need for good instructional design for promoting students' participation in online discussion. But there has been no analysis of discussion tasks set in online learning or the content, frequency and pattern of teachers' messages. Several studies have reported a low level of student message posting. So the question arises: why is the participation so low? There is evidence in the literature that weekly discussion tasks did not stimulate students to post messages as teachers expected. Does this indicate that the design of the task is important to elicit messages from students? Therefore understanding more about of these aspects of the teacher's role in online learning settings is crucial.

3. THE STUDY

The study reported in this paper sought to answer the following two questions:

- How do teachers seek to use the peer group as a resource to promote interaction in the task that they assign participants?
- How were the teachers' methods related to the level of student participation in discussion?

This research used a case study design. An ethnographic approach was adopted for observation of online interaction of students and teachers. From an ethnographic point of view the researcher observed and recorded the online interaction behavior of participants as a non-participant observer [40].

An undergraduate paramedic course delivered online through the TopClass system using World Wide Web was the case for this study. Fifty first year students and 45 second year students, who were enrolled in 2000, and their teachers, were the participants. The students resided in five different countries, however a majority was Australian (58). Generally the students were employed in some aspect of paramedic practice while they were undertaking the course and students were attached to a hospital to meet the course requirements for two of the subjects in the course.

The course consisted of seven subjects completed over two years part-time. Five subjects were taught online. The first year students participated in online interaction in three subjects. These were Professional Basis of Paramedic Practice 1 (PBPP1) (semester 1), Issues in

Prehospital Health Service Delivery (IPHSD) (semester 1) and Professional Basis of Paramedic Practice 2 (PBPP2) (semester 2). The second year students studied two subjects Prehospital Ethical and Legal Issues (PELI) (semester 1) and Research in Paramedic Practice (RPP) (semester 2). Online weekly lecture notes, including the discussion tasks, were posted on the TopClass for students to read and discuss.

The following data were collected. The online lecture material prepared by the teachers that included the discussion tasks for the students for each subject was collected in electronic and hard copy forms. Online messages from students and teachers in the discussion list of the TopClass were collected and counted. An end of year questionnaire was administered to all students to understand their experience of studying online, peer learning, teachers' feedback and the resource materials. Telephone interviews were conducted with a small group of students (7) randomly selected from students who were high, moderate, and low contributors in discussion about the use of ideas in messages posted by fellow students and the usefulness of the teacher's contribution in online discussion. Six teachers including the coordinator of the course were interviewed at the beginning and end of each semester. The first interview was conducted to collect teachers' views on online peer group participation and the strategies they adopted to involve students in online discussion. In the second interview the teachers were asked about their views of students' message posting over the semester. This included quantity and quality of messages posted by students. The teachers were also asked to comment on frequency of messages posted by each student.

Frequencies were calculated for the number of messages posted by each student in response to the discussion task, to their fellow students and to the teacher, the total number of messages posted by students in every week and the weekly and total number of teachers' messages. Frequencies of students' responses from the end of year questionnaire were calculated. The interview transcripts of all teachers were analysed qualitatively. The interviews were read to signify categories of responses for each question.

The nature of students' messages were analysed using qualitative methods in a larger study that explored the nature and extent of peer group learning in this course [19]. A qualitative analysis of the discussion tasks in the subject with the highest participation levels was done to illuminate the nature of the discussion tasks used by this lecturer. The tasks were summarized and categorized as open ended or closed. Further categories of these tasks were based on the content of students' messages with respect to the particular tasks. Hence the discussion tasks were also categorized as relevant or not relevant to students' professional practice, controversial or not, and whether they were an application of knowledge.

4. RESULTS

4.1 Messages posted by students and peer group interaction

The weekly online lectures, that were all available at the beginning of semester, comprised an abstract, key terms, required readings, overview of the content of the topic, discussion tasks and further readings and web links. The number of messages posted by individual students in every week for each subject is shown in Table 1. The proportion of students who posted these messages and the total number of messages posted by teachers are also included in Table 1.

Data in table 1 shows that most messages were posted in a few weeks. In these weeks a relatively high number of students (the highest was 20) engaged in message posting. A smaller number or no messages were posted in most weeks' discussions. In general, there were fewer messages posted in the later weeks in each semester.

Table 1. Message posting by students and teachers.

Week	PPBP1 (N=35) *	IPHS D (N=35)	PBPP 2 (N=34)	PELI (N=34)	RPP (N=35)
1	22	27	21	34	23
2	2	19	20	18	19
3	7	4	7	17	13
4	16	2	40	20	14
5	7	17	3	18	27
6	1	0	10	11	13
7	6	2	4	2	12
8	4	0	3	0	1
9	3	0	42	7	4
10	0	0	3	4	3
11	1	0	1	1	9
12	9	0	0	0	1
13	0	0	0	0	0
Total student messages	78	71	154	132	139
% of students participating	37.1	51.4	64.7	76.5	77.1
Total teacher messages	25	21	37	52	141

* N is the number of student enrolled in the subject.

The proportion of students contributing to the total number of messages recorded varied from 77% for RPP, a second year subject, to a low 37% for PPBP1, a first year subject. Analysis of the messages posted by individual students showed a skewed distribution. Very few students were high contributors. These students posted

most messages in each subject. Others posted few messages or no messages. In PBPP1, five of the students were high contributors who posted 67.9% of the 78 messages. In IPHSD six high contributors posted 63.4% of the 71 messages. In PBPP2 five high contributors posted 72.7% of messages. The patterns of message posting in second year subjects were similar to the first year subjects. In PELI seven high contributors posted 56.0% of messages and in RPP the pattern of a small number of high contributors was also evident in this subject, though not quite to the same extent. In this subject, six high contributors posted 47.7% of these messages in class discussion.

It was found that the students posted messages in response to (i) the discussion task, (ii) fellow students, or (iii) teacher. These three patterns of messages posting (online interaction) were the same for all first year and second year subjects as shown in Table 2. Table 2 shows that in the three first year subjects and one of the two second year subjects many interactions (27% to 40%) took place between students. But most of these interactions occurred between a small number of high contributors in these four subjects. This may indicate that these students were supportive of each other's learning. However in RPP very few interactions took place between fellow students. In this subject the teacher posted a total of 141 messages, which is almost equal to the number of messages posted by the students. It was found that in RPP the students responded to the given tasks and the teacher responded to almost every message posted by the students. The behavior of students in this subject suggests that they did not value responding to other students for their own learning.

Table2. Frequency of messages posted to the discussion task, fellow students, and teacher

Online interact-ion Pattern	PBPP1	IPHSD	PBPP2	PELI	RPP
	N (%)	N (%)	N (%)	N (%)	N (%)
Responding to discussion task	52 (66.6)	41 (57.8)	88 (57.1)	85 (64.4)	118 (84.9)
Responding to fellow student	21 (27)	25 (35.2)	61 (39.6)	39 (29.5)	15 (10.8)
Responding to teacher	5 (6.4)	5 (7.0)	5 (3.3)	8 (6.1)	6 (4.3)
Total	78 (100)	71 (100)	154 (100)	132 (100)	139 (100)

4.2 Teachers' views of peer group interaction

The teachers' responses revealed that the number of messages posted by the students were below their expectations. However they were happy with the quality of students' messages. They reported that most messages from students possessed high quality, in that they were self-explanatory and provided potential for the acquisition of knowledge by others. The teachers thought that the students responded to the task and their fellow students using their past experience. The teachers believed that discussion between fellow students of various backgrounds, some of whom were highly motivated, promoted broader understanding of the overall professional practices. This helped the students' understanding of their duties in particular situations and enhanced their decision-making processes.

4.3 Students' perceptions

The students' perceptions of the value of on-line discussion were in accord with the teachers. Out of 69 students 40 students replied to the end of year questionnaire, a response rate of approximately 60 %. Students had positive perceptions about the online interaction and the discussion tasks. More than one-third of respondents said the online interaction was 'useful' and others said 'quite useful' and 'very useful'. The students acknowledged that they read messages to compare their ideas and enhance their knowledge about the tasks.

All seven students who participated in the telephone interview reported that online peer group interaction was very helpful for understanding the discussion task and enhancing their knowledge of the topic. They valued sharing ideas and experiences through online discussion, explaining discussion tasks from different points of view, positive and negative comments by fellow students, and suggestions for handling particular patient situations. Qualitative analysis of the messages that students posted provided further evidence of how interaction between students contributed to enhance understanding among the group [19].

4.4 Design of discussion tasks

In this course each of the lecturers included more than one discussion task (varied between two and eight) in the weekly online lecture material. In the teachers' interviews they were aware that the students were employed in paramedics, so to encourage and involve students in online interactions the teachers used discussion tasks relevant to the content of the topic as well as to their professional practice. They said that they tried to make the discussion tasks easy to understand, interesting, to attract students' attention and to enable students to draw on their past professional experience.

The total number of discussion tasks set in each subject varied from 35 tasks in one second year subject to

64 tasks in two first year subjects. Analysis showed that students responded to only some of the tasks for the week in each subject. For example, students responded to 30 discussions tasks among 58 that were set in Professional Basis of Paramedic Practice 2. The nature of the tasks of most of the discussion tasks used for Professional Basis of Paramedic Practice 2 were analysed qualitatively. This subject was chosen for analysis because it recorded the highest number of student message. In this article we analyse the tasks for week 9 of this subject to illustrate the findings of the qualitative analysis. Week 9 was chosen because the highest number of messages was posted in this week and it was uncharacteristic for such a high number of messages to be posted later in the semester (see Table 1).

Out of seven tasks in week 9 (see Figure 1) students responded to five tasks. The tasks were categorised as described above.

<p><u>Task 1.</u> A detailed understanding of pharmacology and specialist training is not required with well written “protocols” describing the appropriate course of action for a given set of circumstances. Hence Fire Brigade Members could fulfil the task of a Paramedic. Please comment on the above statement.</p> <p>[Category: relevant, controversial, open ended]</p> <p>Students posted 20 messages and the teacher posted three messages.</p> <p><u>Task 2.</u> What is the clinical consequence of the variance in half-lives between narcotic agents and naloxone when tending to someone who has taken a narcotic overdose?</p> <p>[category: relevant, controversial, open ended]</p> <p>Students posted seven messages and the teacher posted one message.</p> <p><u>Task 3.</u> Narcotics drugs are invaluable in the prehospital management of a number of different conditions. The risk of serious adverse effects or overdosing a patient is minimal because of the availability of naloxone. Therefore, all paramedic personnel should be able to administer morphine, not only intensive-care paramedics.</p> <p>[Category: relevant, controversial, open ended]</p> <p>Students posted nine messages and the teacher posted no message.</p> <p><u>Task 4.</u> A man drinks 3 x 285ml glasses of full strength beers and three ‘nips’ (30ml) of scotch over a period of three hours. At the end of the three hours, what would be his expected blood alcohol level?</p> <p>[Category: application of knowledge, closed]</p> <p>Students posted four messages and the teacher posted one message.</p> <p><u>Task 5.</u> As an activity, categorise the effects of alcohol shown in the flow chart according to the rule of “D”s.</p>	<p>[Category: application of knowledge, closed]</p> <p>No one posted a message.</p> <p><u>Task 6.</u> The medical and social costs of alcohol on the community are immense. Indeed, from the paramedic perspective the consequences of alcohol consumption on the road, in the home, and in combination with legal and illicit drugs from (sic) a huge part of our work. The consequences of alcohol use are often as worse and certainly more widespread compared to that of heroin. At the very least, there should be a zero alcohol level when driving a car. What do you think?</p> <p>[Category: controversial, open ended]</p> <p>No one posted a message.</p> <p><u>Task 7.</u> For each of the three drug groups (TCAs, SSRIs and NSRIs), state an example generic agent and its trade name.</p> <p>[Category: application of knowledge, closed]</p> <p>Students posted two messages and the teacher posted no message.</p>
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Figure 1. Discussion tasks, categories and number of messages in week 9 for PBPP2.

Analysis showed that students were more likely to respond to tasks that presented a controversial issue that was directly related to their professional practice, for example Task 1. These tasks provided scope for discussion from different points of view and were easy for students to contribute to. It appeared that the students did not consider that their professional knowledge and experience concerning controversial issues within the general community were part of the learning for this subject, as no-one responded to Task 6. Students were not likely to respond to closed questions about the application of content knowledge, for example Task 5. Students responded to a few closed tasks (questions) where the ideas given was very much central to the paramedic’s duties (Task 7). However most tasks that were closed questions did not generate discussion. There was no scope for argument that could promote message posting. In this week’s discussion most messages were posted for the tasks that were relevant to the aspects of paramedic practice, controversial, and open ended.

4.5 Supporting discussion

The teachers contributed different numbers of messages in discussion in different subjects (Table 1 above). The teacher for RPP not only posted the highest number of messages but also posted more messages than the teachers in the other four subjects combined. The teachers posted messages during the week that students were posting their messages. In RPP the teacher responded to every student when they posted messages in response to

the given task. However, in the other four subjects the teachers did not respond to every student's message. In these classes the teacher responded to the whole class during students' interaction and sometimes to specific students. The students valued the teachers' feedback during online interaction. More than one-third of students perceived the teachers' feedback as 'very useful' (36%) and others answered 'quite useful' (31%) and 'useful' (33%).

Exceptionally, for a few weeks in PBPP2, the teacher posted messages at the beginning of the week before the students to summarize the previous week's discussion or to stimulate students to respond to the task in the current week. At the beginning of week 2 the teacher posted following message to the group for PBPP2.

Hi group,

Well congratulations, you made it to week 2 – Electrocardiography component. By now you should be able to methodically scrutinise 12 lead ECG's and calculate vectors in your sleep... (sic) not. Never mind, with practice it will lock itself into place and the thrill of competently analysing a 12 lead in the emerg dept will make it all worthwhile.

Note the emphasis on the words methodical and competent...Remember, not all that's elevated is infarction and not all that's wide is VT. The moral – don't rush.

Now on to week 2 – dysrhythmias of atrial and junctional origin. Please be encouraged to participate on the discussion page with particular relevance to the discussion questions written into the week 2 course notes. As always, feel free to message me with any queries you may have or any difficulties you are having trouble coming to grips with. Regards,

In the message the teacher summarized the previous week's discussion, thanked students for their interaction and encouraged students to participate further in discussion.

In RPP, students posted messages in relation to the task and the teacher responded to every student who posted a message. This teacher consistently responded individually to students throughout the course. For example in week 1 the teacher responded to a student:

Student,

What is wrong with the subject matter? An excellent area for research and your questions

etc are right on the mark. I think your last qualitative would be better as a quantitative. Welcome and good stuff.

The message from the teacher indicates an attempt to guide the student and appreciation for responding to the task. The teacher's message also acknowledged the high quality of the student's message and that he/she understood the task and provided the correct answer.

In this study no staff ever responded to student silence on a task. In other words, if a task elicited no response from any student the teacher would not comment on this fact, or indicate why the task had been set, or explain what the task was about, or even chide students for not attempting it. The teachers also maintained their response to 'silence' over the entire subject. They did not comment on weeks when no student responded to any task, or even when over a series of weeks there were no messages posted by students.

5. DISCUSSION

5.1 Teachers' role in design of discussion task

The results show that the teachers attached high importance to message posting by students. Their sole strategy for promoting message posting and interaction between students, was by setting discussion tasks that were optional for the students to respond to. Students responded to only some of the tasks in each subject. Xie and Ke [43] found that teachers act as facilitators to engage students into learning task and to take self responsible action. Salmon [32] gave emphasis to using insightful discussion questions and giving participants time to reflect and respond and Sharpe [39] and Herington, Oliver and Reeves [17] gave importance on inclusion of realistic tasks, examples and illustrations in the lecture materials for student participation. The findings from the previous study provide some indication of the nature of insightful questions, and facilitations at least for these adult professional learners. The data indicated that the tasks that were controversial and open ended created broader scope for presenting different opinions and were more likely to elicit many messages. The content also needed to be central to paramedic practices. On the other hand, closed questions and tasks concerning application of knowledge created limited or no scope for discussion. These tasks that required students to present the correct answer elicited few messages even though the content was central to paramedic practice. The assessment of online discussion [40], and relevance of the topic [16] may provoke students to post messages. But it is unlikely to generate an exchange of experience and ideas unless attention is also paid to the design of the task. A similarly correct response to a closed question, even if highly relevant to the students, enables the teachers to know whether students are paying attention. Students may only

need to read one message to check their understanding of content.

Since the content of four subjects was relevant to paramedic practice, there is an assumption that this finding may apply to the other subjects directly related to paramedic practice, and perhaps adult learners in other professions. For the professional group of students in the current study, if the content of the discussion task was central to their professional duties, controversial, and open ended it evoked more messages. These characteristics of a task stimulated students to contribute or influenced their willingness to contribute. Hence these characteristics of a task may define it as 'accessible' for the students. The relevance of a task with respect to students' professional practices, combined with the controversial issue, created the opportunity for sharing knowledge from their experiences to enhance their existing ideas and build knowledge. Therefore these characteristics indicate the 'cognitive demand' of the task. These findings suggest that online course designers would benefit from professional development materials and other support materials that provide models for constructing discussion tasks that have been successful in prompting discussion without the coercion provided by assessment practices.

5.2 Teachers' role in supporting online discussion

The findings from this study with respect to the teachers' role were (a) the importance that all teachers attached to online message posting and peer group interaction to promote their knowledge in the subjects; (b) the use of a one-shot strategy, that is, communicating almost exclusively with students on the basis of tasks set for discussion on a voluntary basis, had very limited success in promoting message posting; (c) consistent non-responsiveness of teachers to student silence on tasks set; and (d) the two different patterns of response to students' messages, that is supporting all the students collectively or the students individually.

All five teachers in the current study, irrespective of the subject, responded in some way to student messages posted for every week that this happened. However, there were some individual differences between teachers. The messages for four of the teachers who responded after allowing discussion to develop between two or more students, had the following purposes: (a) providing guidance to discussion on the content of the task; (b) providing feedback on the message posed [25]; (c) encouraging students; and (d) summarizing discussion. One teacher, however, took a different approach in the one subject that person was responsible for. That person's approach was to comment on almost every message as soon as it was posted. The purpose of these comments was to develop individual students' research skills relevant to students' paramedic practice.

These differing patterns may reflect the teachers' different conceptions of their online role, or they may

reflect the nature of the subject matter being taught. In the current study the teachers' role in four subjects indicates that the teachers guided students to generate their own ideas when responding to the tasks and exchanging messages with each other [31]. Makrakis [31] used the terms "facilitator" and "scaffolder" to describe this role. This pattern of the teachers' role indicates a process of helping students to construct their understanding through interacting with each other [21]; [36]. On the other hand the pattern of teacher's support in RPP shows that the teacher encouraged students to post messages, and guided every student to construct their own knowledge [21]. The method adopted by Liu [24] in teaching Research Methods in Education and Ruey [[30] in Lifelong Learning and Educational Innovation showed how a constructivist design of an online course could create an opportunity for interaction between students.

In spite of the importance that the teachers placed on using the peer group as a resource for promoting interaction on the task, it would appear that the teachers had very limited strategies for so doing. Further they also had quite limited success in persuading participants to post messages online. These findings indicate that online teachers need to develop some strategies for 'silence'. These may include posting messages to encourage participation, communicating directly with non-participants regarding progress and participation, re-designing discussion tasks and rethinking the use or mix of non-response study tasks and individual and group discussion tasks. Online teachers may benefit from viewing and discussing transcripts of interactions involving teachers who successfully facilitate and scaffold discussion.

5.3 Peer group interaction

Overall, message posting was low and the students were reluctant to post messages in discussions, a finding consistent with previous studies [13]; [14]; [41]. There were individual differences between students in posting messages and the nature of the tasks is likely to be related to the number of messages posted. Some of the teachers in the current study suggested making discussion compulsory for some weeks and giving reward, that is marks, for participation in discussion, a strategy that was successful for [41].

Analysis showed that the students who did respond reacted first to the task, and some also responded to their fellow students or to the teacher. This pattern of interaction is aligned with the theoretical assertion of Moore and Kearsley [32] that three types of interaction, learner-content, learner-learner and learner-teacher, take place in online discussion. This pattern of interactions is consistent with Islam [20]. The pattern of interaction in four of the subjects indicates that the students' helped each other to understand the meaning of the topic and construct knowledge through conversation. The teachers' comments on students' messages also indicate that the students

understood the tasks and the messages helped them to enhance knowledge. Further to this, irrespective of the level of participation in message posting the students reported that the messages enhanced their understanding and provided a broader understanding of the paramedic practice in relation to the task. They viewed that the variety of information on the basis of fellow students' experiences helped them to construct their knowledge. The questionnaire data suggested most of the 'silent' students read the online messages regularly to compare their ideas and enhance their knowledge on the task. These findings are consistent with previous studies [8]; [27]; [20]. Previous researchers [18]; [30]; have shown that adult learners are motivated, participate in interaction and directed by their own interests towards professional and personal development. The findings from the current study also suggest that the students were self-directed learners to some extent. So the students may have functioned as a supportive peer group in online interaction.

6. CONCLUSION

This study has revealed some vital aspects of teachers' support and evidence of social learning in online situations. The findings confirm that more attention should be given to designing online discussion tasks, and ways of facilitating discussion and providing scaffolding. Conversely due to emergence of web 2.0, online social networks such as wikis and blogs have created an atmosphere for cooperation and easy interaction among teachers and students which is more flexible in nature [28]. In particular, the web 2.0 technologies allow creating activity-rich pedagogical models and facilitate competence development of students [38]. In the present study there is evidence that a high level of interaction occurred between a small group of students where they helped each other to construct their knowledge through peer group interaction. Other students, who are comparatively low participants or silent students, compared their ideas by observing interaction and reading messages also valued peer group interaction in relation to their knowledge acquisition.

The current study has shown that students' message posting in an online situation is likely to be related to the cognitive demand and accessibility of discussion tasks that staff design and the quality of teacher facilitation of discussion. These factors are likely to enhance students' participation in online discussion and to encourage interaction with peers that may contribute to knowledge building among students, although personal differences between students is also a factor affecting participation. Further research should examine more widely the reasons for different patterns of teachers' support, the factors that contribute to silent students' behavior and the nature of the discussion task.

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