MEASURING ONLINE INTERACTION

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ABSTRACT

Equivalency Theorem (Anderson, 2003) suggests "deep and meaningful" learning is possible as long as one of the main forms of interaction is at a high level: student-teacher; student-student; student-content. In measuring an online interaction, one common technique used is content analysis. It is a technique to study the interaction patterns among students and tutors. It also enables researcher to study human behaviour in an indirect way through an analysis of their communication. (Fraenkel and Wallen, 2006). This paper will look at (1) the use of content analysis used to measure on-line interaction and (2) the application of Salmon's Five-Step model in analysing online interaction which has been criticised by Moule's E-learning Ladder model.

Keywords: *On-line learning, online interaction, qualitative approach, quantitative approach, coding procedure, synchronous interaction, asynchronous interaction*

INTRODUCTION

The dilemma of how to measure online group interaction has been the focus of many researchers who conducted the study of online learning. This online group discussion is mainly from asynchronous online learning through course management system such as Moodle, WebCT or Blackboard. Researchers normally look at both the quantity and quality of the interaction. The quantity part of the interaction is referred to numbers of messages posted by the students. As for the qualitative part, it is the evaluation of the quality of interaction that is the concern.

Brook & Oliver (2003) stated that the majority of literature that examines the online learning that occurs within asynchronous discussion has predominantly centred on the qualitative analysis. The adoption of quantitative methodology would complement the study. However, it is still a debate though. In fact, the measurement itself is still being debated whether it should be designed qualitatively or quantitatively. In many cases, studying online interaction would take both approaches which are known as mixed-method approach.

Equivalency Theorem (Anderson, 2003) that suggests "deep and meaningful" learning is possible as long as one of the main forms of interaction is at a high level: student-teacher; student-student; student-content'.

CONTENT ANALYSIS

Content analysis is a technique that enable researcher to study human behaviour in an indirect way through an analysis of their communication. (Fraenkel and Wallen, 2006) Content analysis is a very transparent research method as it is often referred to as an objective method of analysis and can allow a certain amount of longitudinal analysis. (Bryman, 2004). Most researchers used content analysis to analyse online interaction among students and tutors. Number of postings from students and tutors were gathered from the online forum. Online interaction is a complicated concept, and it can be difficult to know when it is occurring, how effective it is, how to encourage it, or what is preventing it. However, online interaction can be easier to manage, track and understand because the communications are all written. The record can be kept of everything that occurs during the online sessions.

Bryman (2004) warned of the pitfalls in devising coding schemes especially in making sure the dimensions are entirely separate, the categories are not overlapping and all possible categories should be available to coders. All discussion on the threaded web discussion must be transcribed and coded. Messages should be arranged chronologically by date and time. Then, each message was divided into statements. A statement is a complete sentence or a complete idea within a sentence. Complex sentences can contain more than one statement. It is important to divide messages into statement. This is because in CMC discussion, one message can reply to one or many messages, as well as discuss various other topics that may or may not be related. Thus, the goal of the coding is to identify all of the ideas discussed as well as the true structure of the discussion threads. Sometimes, analysing the thread of messages as entered by the students and generated by the logs may be inaccurate. This is actually misleading. Students do not necessarily place messages and responses in the correct sequence. That is, a message that responds to the ideas in a previous message may be placed in a completely different thread. This would leave researchers to make the connections on their own. Therefore, in analysing the online interaction, researchers must be very particular of the manifest and latent content.

MANIFEST VERSUS LATENT CONTENT

Looking at the actual patterns of communication that takes place within groups can be easier with text-based online groups than with face-to-face ones. This is because there is a permanent record of all text-based online interactions. However, the analysis of interaction did not include body language cues such as intonations and facial expression that made up the important part of face to face interaction. Therefore, it is necessary for Nisbet to examine the transcripts of the interactions carefully to see beyond superficial aspects. Fraenkel and Wallen (2006) differentiate between manifest and latent meaning in the study of content analysis. The manifest content of a communication refers to obvious and surface content whereas the latent content of a document refers to the meaning of underlying what is said or shown. This is where content analysis becomes particularly controversial when it is used to seek out latent meaning or themes and not just manifest meaning from the coded transcripts of the online interaction.

Analysing the thread of messages as entered by the students and generated by the system may be inaccurate. As the analysis of interaction did not include body language cues such as intonations and facial expression that made up the important part of face to face interaction, there would be possibility in misinterpreting the coding of the interaction.

ONLINE TUTORS

The importance of online tutors does not just understand the online interaction but must possess the following skills which include computer literacy, communication, interpersonal relationships, supporting new ways of working, motivating learners, overcoming learner isolation and professional development. Zheng and Joyes (2006) Representing better practice of the tutors in handling the online interactions is quite subjective. How much do the online tutors know how to handle interactive discussion? Different tutors would have different styles. Besides understanding interactive discussion, researchers need to be aware that tutors must understand collaborative learning as well. Some researchers have outlined the differences between co-operative learning and collaborative learning. The term co-operative is often used interchangeably with collaborative, but according to McInnerney and Roberts (2004), they have different meaning. McInnerney and Roberts (2004) referred to Millis (1996) who defined co-operative learning as to describe a situation where students work together in a small group to achieve a common goal. As for collaborative definition, Paz Dennen (2000) explained that it is a learning method that uses social interaction as a means of knowledge building. Cooperative learning is more directive than a collaborative learning as it is closely controlled by the teacher. (Panitz, 1996) In analysing the online interaction, online tutors must have knowledge of Salman's five-step model before guiding the students through the modules.

SALMON'S FIVE-STEP MODEL
Most studies were focussing on the asynchronous online discussion group. Number of postings from students and tutors were gathered from the online forum. Postings were coded from the online interaction and were analysed based the coding on Salmon's five steps model.

The five-step model suggests 5 stages in analysing online interaction which is based on access and motivation (Stage 1), online socialisation (Stage 2), information exchange (Stage 3), knowledge construction (Stage 4) and development (Stage 5).

Manson (1991) advocated three key roles of the online tutor: organisational, social and intellectual. Stage 1 and 2 of the Salmon's five-step model would suit the two roles of online tutors – organisational and social. The organisational role requires the online tutors to set the agenda, objectives, timetable and procedural rules for posting and interaction. Recommendations for online tutors would be patience, avoiding lecturing and inviting guest speakers. They should also entice students into discussions and participation in the online class. Without the organisational role, many online learners would lack the necessary support structures. As for the social role, the online tutors are required to reinforce good discussion behaviours.

Of the three roles, Mason (1991) describes the intellectual role is the most crucial.
Online interaction of step 3 and 4 of Salmon's five-step model are quite difficult to achieve. It needs a careful attention and meticulous analysis. These stages include high level activities such as asking questions, probing responses and refocusing discussion. It also entails setting goals, explaining tasks and overlooked information, weaving desperate comments, synthesising key points raised, identifying unifying themes, directing discussion and generally raising the intellectual environment of online course. (Mason, 1991)

Zheng and Joyes (2006) focussed on online tutor in supporting the students of new ways of working. They emphasised on learner centred approaches where the learners are able to develop a more autonomous approach to their learning while online tutors must also motivate learners to complete the work and to be more autonomous in the learning process. This indicates stage 5 of the Salmon's model where students are responsible for their own learning.

Moule's E-learning Ladder model.
Salmon's five-step model has been widely used and cited in many researches to reflect the progressive stages in the online learning.

Although the model is considered as a template for the design of online learning and teaching, there are clearly some drawbacks. Pam Moule (2007) pointed out that Salmon's five step model had ignored the following elements. First, the model ignored the variety of learning theories and elearning approaches. The online system does not only consist of asynchronous interaction but provides synchronous communication as well. Second, Salmon's model supported only constructivist approach. The model did not take into account the individual learning styles. The formation of community of practice as a result of online interaction does not necessarily contribute to the students' understanding. Some students might have proceeded with individual learning such as using multimedia or web-based learning packages on their own. Thus, students learning starts with instructivist approach which was not explained in the Salmon's five-step model. As for the rungs, they begin with information gatherings, interactive learning media, synchronous transmission (video conferencing), email discussion/discussion board, virtual 'chat' classroom, and communities of practice online. Third, Salmon's five step model had outlined the rigid application of the design. However, the rungs of elearning ladder operate not in a rigid way but they are interlinked with each other in various directions depending on where the students start with the online interactions. Fourth, Salmon's model did not consider the new technology such as mobile technology that also causes the rungs to be interlinked in various directions.

Based on these weaknesses, Moule has extensively revised the model and produced a new detailed model that she called the "elearning ladder". Instead of using stages in Salmon's five-

step model, Moule introduced the e-learning ladder which constitutes of "rungs" and "side" of the ladder. The rungs are organised in stages starting from the bottom of instructivist approach to the top of constructivist learning. The rungs are flanked by ladders on both sides. The ladder on both sides of the rungs offers supports for the students to access the rungs. The supports are group working, facilitation, longevity of engagement, ICT access, IT skills and technical supports. Still, the role of online tutor is vital to ensure the online interaction is fruitful. Nevertheless, neither Salmon nor Moule had provided any specific module for the online tutors.

Joyes (2006) questioned whether both models (Salmon's five step model and Moule's elearning ladder) were able to transfer educational practice into other context of teaching and learning. Thus, a generic e-Learning Tutor Training Module for training of e-learning tutor was proposed. The module was based on the Learning Activity Analysis Tool (LAAT). LAAT was adapted from the 8-step model of Mwanza (2001, 2002) which incorporated each component of Engeström's (1987) Activity System. In fact, LAAT could match the design learning activity with the current context for learning. The generic module of tutor training module is more practical in nature as it facilitates the trainee online tutor with learning activities in duration of nearly one semester (10 to 14 weeks). It can be used across different content subject and disciplines for online learning.

Ashton et. al. (1999) suggested that future research look at the role of the instructor in these roles from the start to the end of an online course, across instructors, across different offerings of the same course and across different courses.

Web-based learning has been increasingly used to supplement learning materials in traditional learning environment with a concept called 'blended learning'. The important element in online learning is the aspect of interaction. Moore (1989) describes the interaction that taking place in three ways: learner-to-content; learner-to-instructor; and learner-to-learner. It is the type of interaction between one learner and another, individually or in groups, with or without the presence of an instructor, which has become an important dimension in online learning. Future research would be suitable to focus more on this type of interaction.

CONCLUSION
In reality, the educational research field on online learning has witnessed two major groups of researchers. One group would prefer the approach of qualitative to promote the effectiveness of online learning which formed the majority researchers.

However, the other groups are facilitating the online learning research with quantitative methodology. Realising some drawbacks from both approaches, moderate researchers are embarking mixed-method strategies.

Regardless of being either qualitative or quantitative, educators, researchers and developers are working aggressively with on-line learning communities to foster high-level discourse. It is meant to support growth of knowledge within online communities. As a result, online learning is changing the role of students and tutors. On one hand, tutors are no longer delivering knowledge. Instead, tutors are part of the online learning communities and are sharing learning with students. On the other hand, students are no longer recalling information. The emphasis is more on the interaction and collaboration between tutors and learner. (Berge 2000). Online tutors are the new generation of teacher who are working with students. Online tutors need special training if online learning is to be successful and productive.

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