THE STUDY OF ARGUMENTATIVE KNOWLEDGE CONSTRUCTION IN WEB 2.0 LEARNING ENVIRONMENT TOWARDS STUDENTS' CRITICAL THINKING SKILLS

INTRODUCTION

In recent years, the Malaysian education system has come under increased public enquiry and debate, as parents' expectations rise and employers expressed their concern regarding the system's ability to adequately prepare young Malaysians for the challenges of the 21st century.

In order to properly address the needs of all Malaysians, and to prepare the nation to perform at an international level, it is important to first expect what a highly-successful education system must accomplish, particularly in the Malaysian context; (1) what kinds of students are best-prepared to meet the challenges of a 21st century economy? (2) what kind of education prepares them for this rapidly globalizing world?

Currently, in a knowledge-based economy, it is important to create new knowledge in order to be able to connect to different pieces of knowledge and learn how to continue acquiring knowledge throughout their lives which encouraging an interest for inquiry and lifelong learning. Each student will learn a range of important cognitive skills, including problem-solving, reasoning, critical and creative thinking, and innovation. However, this is an area where

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the system has historically fallen short, with students being less able than they should be in applying knowledge and thinking critically outside familiar academic contexts (Malaysia Education Blueprint, 2012).

Thus, in this era of rapid development of Information and Communication Technology (ICT), online collaborative and social learning has been seen as one of the ways to encourage students' critical thinking skills. Past studies have proven that students' critical thinking skills were shown significantly when it is done socially and collaboratively amongst peers (Gokhale, 1995; Dillenbourg, 1999; Veerman, Andriessen & Kanselaar, 2002; Chou & Chen, 2008; Noroozi et. al, 2012). Previous researches also stated that cooperative teams achieve at higher levels of thought and preserve information longer than learners who work quietly as individuals. In addition, working in a collaborative environment also involves processes of evidence and argumentation (Rosen & Rimor, 2009).

In order to deal with collaboration and argumentation, Web 2.0 technology has makes it an easy and popular way to communicate information to either a select group of people or to a much wider audience. The University can make use of these tools to communicate with students, staff and the wider academic community. It can also be an effective way to communicate and interact with students and research colleagues.

Hence, this research study addresses the area of social learning environment to facilitate argumentative knowledge construction, a subject which is relevant for both Higher Education and lifelong learning in order to improve students' critical thinking skills mainly in the Web 2.0 learning environment.

COMPUTER SUPPORTED SOCIAL-COLLABORATIVE LEARNING ENVIRONMENT

If paired with a wide-ranging methodology of use, ICT, and in particular social technology, has a good potential to support learning and knowledge building in higher education (Hamid, 2009; Hemmi et al., 2009; Hughes, 2009; Scardamalia & Bereiter, 2002). As concerns the topic of interest for this study, Steinberg (1992) points out that the key feature of ICT with respect to practicing argumentation and critical thinking is its potential support to the focused discussion of alternative points of views between participants. Students in social digital environments are not affected by some factors typical of face-to-face settings that may inhibit discussion (such as gender, age, ethnicity, performance skills). Besides, studying through ICT consists mainly of text-based contributions to the topics under consideration. Henri (1992) indicated that a written text demands exactness, careful consideration, and explicit expression of thoughts. These qualities are important in argumentative dialogues and debates in which the goal is to assess the strengths and weaknesses of others' contributions. Several studies such as (Littlefield, 1995; Marttunen, 1999) also suggest that learning environments in which students are engaged in active interaction and debates with each other are beneficial when the aim is to promote argumentation skills.

CSCL and Social Collaborative Learning Environment

Recently, a variety of new tools and technologies nurturing computer-supported collaborative learning (CSCL) and computer-supported cooperative working (CSCW) appeared and established themselves on the Internet (Beldarrain 2006; Bryant 2006). This development is frequently referred to as Web 2.0 (Bridsall 2007; Murugesan 2007). On the one hand, the term Web 2.0 describes a set of new interactive technologies and services on the internet (Richardson 2006). As an alternative, it refers to a modified

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utilization of information (Tredinnick 2006).

The social network services (SNS) provides opportunities for the individual learner to create sound and practical knowledge syntheses from broken and immature information. The generation of practical ideas, sharing of common classes of problems and the common pursuit of solutions enables individuals to aim toward a common goal of knowledge creation (Owen, Grant, Sayers & Facer, 2006).

Currently, a second generation of web-based communities and hosted services such as social networking sites, wikis and folksonomies provided account for a significant serving of web traffic and content generation. The term Web 2.0 has been invented to embrace such collaborative applications and also to indicate a social approach to generating and distributing Web content, characterized by open communication, decentralization of authority, and freedom to share and re-use. Implicit and explicit in many Web 2.0 applications are social networks, through which users share and filter content, collaborate, seek information, and interact socially on the Web.

One of the key features of Web 2.0 application is collaboration, not only between machine and user, but also among users. These social applications have the capacity to function as 'intellectual partners' to promote critical thinking and facilitate cognitive processing (Voithofer et al., 2007). Text, voice, music, graphics, photos, animation and video are combined to promote users' thinking and creativity when undertaking high-level tasks. They offer a wide range of resources that can be used for problem solving, critical thinking collaboration and so on (Dillenbourg, 1999), in both physical classrooms and virtual learning environments. In addition, Web 2.0 technologies, with their interactivity potential, foster active participation and student-centered learning. Collaboration among students is a defining feature of constructivist classrooms

(Jonassen et al., 1993), and Web 2.0 has wide-ranging potential for social interactivity and the promotion of collaboration and collective learning. Virtual communities of students can be organized on the Internet, allowing them to work in small groups to attain shared objectives and to strengthen their commitment to the values inherent to collaborative working. The more or less diverse grouping of students for the purpose of undertaking tasks may favor the creation of 'zones of proximal development' (Vygotsky, 1978) and provide students with opportunities to construct shared meaning for their practices (Dillon, 2004).

Facebook for Collaborative Argumentation

The impact of Web 2.0 and social networking tools on education has been much commented on. In order to support knowledge construction, learning environments should allow for self-organizing system of interactions among participants and their ideas (Scardamalia & Bereiter, 2006). Computer mediated communication environments have provided multiple ways to interact and exchange information among groups of users in the form of messages or files: emails, forums, discussion boards, blogs, instant messaging, social spaces, learning management systems.

Today, Facebook (*www.facebook.com*) is probably the most tangible example of environments known as social networks or Web 2.0. Besides, Facebook is one of the services are freely available online. There are a number of unique features that make it suitable in education. Facebook is equipped with discussion forums, instant messaging, email, and the ability to post videos and pictures. Most notably, Group feature on Facebook seems to be a powerful tool for collaborative learning. Students can use this Group feature on Facebook to perform various tasks and share resources at the same time. Students create a 'Group' to pertain to their interests.

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Basically, social networking sites are platforms that facilitate information sharing, interaction and collaboration among their users. However, Facebook's success is not only dependent on its capacity to connect people, although this was its initial orientation. The platform's power for sharing resources and linking content on the Internet to user profiles, as well as its evolution towards life streaming and micro blogging, enable it provide support for complex, continuous interaction experiences and, consequently, to structure collaborative-learning processes. The platform's communication tools, combined with the option to enhance its potential by installing third-party modules and applications, allow members of a community or work team to carry out very diverse activities.

Facebook is an example of a Web 2.0 social networking site, which has enormous potential in the field of education despite the fact that it was not designed as an environment for constructing and managing learning experiences. It operates as an open platform, unlike other systems organized around courses or formally structured content. In fact, while Facebook is not a learning environment, either in its underlying concept or the design of its tools, it can serve as a very valuable support for the new social orientations now dominant in approaches to educational processes. According to Garrison et al. (2005), learning communities represent a fusion between the individual realm (subjective) and the shared realm (objective). In this context, Facebook represents a great opportunity to generate knowledge and inter-group cohesion.

A number of high-level thinking skills and socially rich activities could result from the use and management of Facebook. A few educators are already exploiting the potential of Facebook to transform the learning experience into one in which student centered learning can be facilitated. Facebook may become a focal point of interest for developing communities of practice, within which they can store their treasure house of knowledge about their

specific interests and learning. In the other hand, for example in the classroom learning, teachers will need to encourage all members to contribute thereby fostering a sense of community, but it is inevitable that some students will contribute more content than others. Moreover, social loafing is sometimes observed where the contribution rate for some students is unequal to others. However, providing all members are deemed to have contributed something within a defined period, teachers might adopt a laissez-faire attitude. Previous studies also shown that some students learn even when they do not directly contribute to a message board, which has been termed 'lurking' (Beaudoin, 2002).

KNOWLEDGE CONSTRUCTION

Knowledge construction starts with the learner articulating an intention to build knowledge. That may be stimulated by a question or problem, a failure to achieve something, a general curiosity, an argument or anything that perturbs a person's understanding enough to want to make sense out of it (Jonassen, 1999).

SNS, such as Facebook, are an increasingly important platform for CSCL. However, little is known about whether and how academic opinion change and argumentative knowledge construction can be facilitated in SNS. Existing argumentation practice in informal SNS discussions typically lacks elaboration and argumentative quality (Tsovaltzi et. al, 2012). Argumentative knowledge construction (AKC) is the deliberate practice of elaborating learning material by constructing formally and semantically sound arguments with the goal of gaining argumentative and domain knowledge. Argument structure provided through individual argument diagramming is among the most prominent approaches to foster AKC in CSCL environments (Scheuer et al, 2010). However, there is little known about the extent these approaches can be applied to learning in SNS (McLoughin, & Lee, 2010; Tsovaltzi et al, 2012).

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Research results learning suggest that argumentative elaboration can promote individual knowledge construction, and can greatly benefit from additional support through scripting, i.e. socio-cognitive structures that specify what learners are to do in collaborative learning scenarios (e.g. Baker & Lund, 1997; Weinberger, Stegmann & Fischer, 2010). Learners, for instance, can be prompted to provide support or counterarguments for their claims. This can help them elaborate the task, gain argumentative knowledge, understand multiple perspectives, and promote knowledge convergence (Weinberger et al., 2010). An alternative way to script learners is to let them first work on a task individually and then compare and combine their individual solutions (e.g., Weinberger, 2011; Asterhan & Schwarz, 2007). Such approaches may prevent process losses of simultaneously following diverse instructions, also characterized as over-scripting (Dillenbourg, 2002), which can hinder AKC. Moreover, learners in online discussions often dismiss conflicting opinions and inconsistencies rather than try to resolve them. Raising awareness of opinion conflict is one way to foster critical argumentative elaboration during collaboration and take advantage of the dialogic potential of SNS (Bodemer, 2011).

Argumentation

Argument can be defined as the reason(s) a person gives in support of a claim. Basically, argument is not just a matter of presenting information but rather is a matter of presenting a conclusion based on information or reasons. Argument consists of evidence presented in support of an assertion or claim that is either stated or implied (Seyler 1994). This paper defines arguments as a set of claims, one of which is supposed to be supported by the rest as used by Toulmin (1958).

In educational studies, the social function of argumentation has

been similarly emphasized, both with regard to its role in building disciplinary knowledge and its role in facilitating students' learning and understanding of disciplinary knowledge (Mitchell & Andrews, 2000). In particular (Mitchell, 1994) asserts that argument is about 'bringing difference into existence' and that from a students' point of view, this can be a difficult task. Not only do students have to acquire the discourse of the discipline and 'to manage the actual voices and meanings of others in the forms of citations and references to existing writers in the field' but in addition they have to go 'beyond this, to construct an argument out of and in response to these voices' (Mitchell, 1994). The result of this process can be the suppression of the student's voice whereby the writing may contain arguments of others but not present itself a strong argumentative line.

Argumentative Knowledge Construction (AKC)

In AKC, learners acquire knowledge through the elaboration of learning material by constructing arguments (Weinberger et. al, 2007). AKC is based on the assumption that learners engage in specific discourse activities and that the frequency of these discourse activities is related to knowledge acquisition (Weinberger & Fisher, 2006).

The importance of AKC in higher education pedagogy lies in its very nature: the study of subjects and disciplines at higher education level implies students' ability to research complex connections among knowledge. Indeed, exploring connections among knowledge, together with acquiring discipline-specific knowledge and inquiry methods can be defined as three distinctive characteristics of higher education pedagogy. These characteristics can also be seen as three forms of argumentative knowledge construction. Therefore, fostering advancements in higher education pedagogy necessarily implies offering students more opportunities to master the argumentative discourse structure.

Argumentation is therefore of interest of the educational research for being a conceptual tool that suitable to promote learning, knowledge building and cognitive growth. Although argumentation skills appear to be so much necessary, university students seldom know how to argue effectively, as documented by several research studies: not only have they difficulties producing relevant evidence to support their positions (Kuhn, 1991), but also they are often guided by beliefs and bias when evaluating arguments. Moreover, Stein and Albro (2001) demonstrate that the affective dimension has a strong influence on students' effective engagement in argumentation: college students tend to avoid getting involved in argumentative discussions for the fear that this might disrupt interpersonal relations with their peers. A further difficulty is introduced by the fact that only generic skills can be used across fields, as argumentation skills are mostly subject-dependent. Hence, it is important for university students to practice argumentation on all subjects of their interest, on which they have command of discipline-specific knowledge and discourse (Mitchell & Andrews, 2000), as well as to be introduced to effective argumentation by means of suitable methods and tools.

DISCUSSION & CONCLUSION

The significance of this study lies broadly in its addressing the important of how Web 2.0 can be used in meaningful ways in the classroom learning and constructing student's knowledge through their critical thinking skills and how it can be used to sustain tied and valued practices in teaching and learning such as argumentation. Due to the availability of such a large literature base in the area of critical thinking and argumentation (Walton, 2005; Walton et. al, 2008) and its importance in knowledge construction, it could be cautiously contended that there is a need to look at the possible benefits of shifting the underlying pedagogical theories to other domains. However, with the importance of using

asynchronous discussions, such as discussion forum, as precedence for research in the area of knowledge construction there is an urgent need to study the use of argument in other domains using online discussion.

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