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Scaffolding Metadiscourse in a Principle-based Knowledge Building Environment

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Abstract: This study investigated how students' metadiscourse can be scaffold and fostered in a computer-supported knowledge building environment emphasizing on principles rather than procedures, supported by Knowledge Forum® (KF), an online discussion platform. Participants were secondary school students studying in a visual arts subject in Hong Kong. In the preliminary stage, an exploratory study was conducted to explore whether students' understanding of discourse was related to their collaborative inquiry engagement in KF. Current analysis of the exploratory study indicated that students who had a deeper understanding would take epistemic agency and collective responsibility in their online discussion than students who had a superficial understanding of discourse. Followed by the exploratory study, study 1 is conducting to design a metadiscourse-oriented knowledge building learning environment and pedagogy in scaffolding students' metadiscourse through discourse understanding and reflection intervention. In the next step, study 2 will be conducted that aimed to address the problems identified in study 1 by implementing an adapted pedagogical design in which integrate with a time-line based collective mapping tool.

Keywords: metadiscourse, knowledge building, CSCL discourse

1. Introduction

Scaffolding students' metadiscourse has always been a central research area in education, specifically in the linguistics domain. Metadiscourse was defined as "discourse about the discourse" and emphasized on self-reflective expressions in adding the meaningful conversations and engagement through oral or written discourse (Hyland, 2005; Latawiec, 2012). A growing number of studies have been conducted to examine students' metadiscoruse focusing on linguistics, especially the metadiscourse markers (Duruk, 2017). However, few studies have examined how the metadiscourse can be fostered in a computer-supported collaborative learning environment. In this study, we followed the line of research on metadiscourse in a computer-supported knowledge building environment that redefine the metadiscourse as self- and community reflection and organization on the ongoing discussion and knowledge advancement (Zhang, Lee and Chen, 2014). Therefore, the purpose of this dissertation was to design, implement, and evaluate a computer-supported KB metadiscourse-oriented environment and pedagogy in scaffolding students' metadiscourse.

2. Literature Review

2.1 Metadiscourse

In the literature, metadiscourse often regarded as an indicator to guide and develop an effective communication between writers and audiences (Latawiec, 2012). Various terms were used for metadiscourse by researchers with different focus, such as metacommunication (Baltzersen, 2013) and metatalk (Stromer-Galley, 2007). In this study, we followed and adopted the metadiscourse as a representation term that refers to the collaborative and metacognitive conversations in identify deeper questions for further inquiry, then, reflect and monitor collectively on the community knowledge advancement (Zhang et al., 2014). A large amount of research investigated the metadiscourse in

language learning and writing focusing on metadiscourse markers, for instance, an explicit instruction in metadiscourse markers on students'' reading comprehension and the usage of metadiscourse in argumentative writing were examined (Anwardeen et al., 2013; Tavakoli, Dabaghi and Khorvash, 2010). However, the previous literature emphasized more on the metadiscourse markers rather than the metadiscourse engagement and reflection in the educational discussion. Further, metadiscourse is often hardly developed by students spontaneously in both online and offline discussion (van Aalst, 2009). Overall, since its importance in students' knowledge creation and difficulty that students meet in the metadiscourse, this dissertation aimed to design and implement a metadiscoure-oriented KB environment and pedagogy to scaffold students' collaborative engagement in metadiscourse.

2.2 Computer-Supported Knowledge Building

In the twenty-first century education, working creatively and advancing knowledge creation were emphasized with a paradigm shift in theories of learning from behaviorism to constructivism, and then social constructivist. Accordingly, Scardamalia and Bereiter (2014) proposed a knowledge-building approach, which is a theoretical, pedagogical, and technological innovation in computer-supported collaborative learning and the learning sciences, with focusing on idea improvement and collective cognitive responsibility to produce knowledge and add value to the community. To support the production of knowledge and sustained discourse of knowledge building, Knowledge Forum (KF), an online inquiry environment, was designed. KF consisted of two main constitutes including "note" and "view". Note is created by students while View is the workspace for students to generate, build-on, and revise their notes (Figure 1). Moreover, metacognitive scaffolds, embedded in KF, are served as the prompts to scaffold students generating their ideas and reflect on their discussion, such as "I need to understand". Further, students can also use the References Function to quote other students' notes to explain their ideas, as well, reflect on the collective progress. To guide KB practices, Scardamalia (2002) proposed twelve KB principles which were essential for students to understand their collective discourse, for instance, epistemic agency and improvable ideas. There is now increasing evidence indicating the positive design and role of KB on students' learning (Chan, Lam and Leung, 2012; Yang, van Aalst, Chan and Tian, 2016). However, few studies have examined how the computer-supported KB environment can enhance students' metadiscourse, and investigated the relationships among metadiscourse engagement, discourse understanding and domain knowledge.

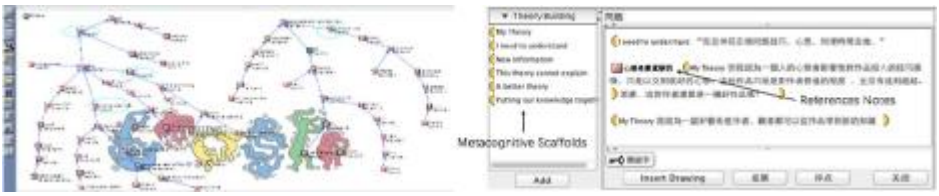

Figure 1. An example of KF "view" and "note"

Specifically, two research questions were addressed for the exploratory study: (1) What and how did students take collective responsibility in KF discussion at the group and individual level? (2) How did students' discourse understanding related to their KB involvement? Further, four research questions were addressed for the study 1: (1) What characterize students' understanding of inquiry and discourse? (2) Do students in the metadiscourse-oriented KB environment involved more in metadiscourse than students in a regular KB environment? And how does the designed KB environment help students improve more on metadiscourse? (3) What are the relationships among metadiscourse, KF engagement, and domain understanding? (4) What are the classroom dynamics that explain students' change on metadiscourse and domain understanding?

3. Methodology

3.1 Participants and context

My dissertation involves an exploratory study, study 1, and study 2. In the exploratory study, participants were 18 Grade 11 students involved in a designed KB environment studying visual arts in a secondary school. In the study 1, participants were four classes of Grade 9 students in a visual arts course with two classes involved in an intervention group and two classes involved in a comparison group. Followed by the study 1, participants were the students in study 1 who continue to study visual arts course in Grade 10. Students in the intervention group involved in a designed metadiscourse-oriented KB environment while students in the comparison group studied in a regular KB environment.

3.2 Metadiscourse-oriented KB environment pedagogical design

In this study, we aimed to design a metadiscourse-oriented KB environment to support students' production of knowledge and enhancement of metadiscourse at both content and inquiry process. The designed KB pedagogy was implemented with four factors interwiend

(1) Doing initial research with epistemic climate classroom culture developing; Students participated in collaborative inquiry to construct mind maps and worked as groups to generate questions and ideas by using cards, and posting their cards on a KB Wall (Figure 2) to publish their ideas.

Figure 2. An example of students' mind map and KB Wall

(2) Scaffolding students engage in inquiry and writing on KF. Students first tried to generate questions and ideas on KF, as well, build-on others' notes. Metacognitive scaffolds were provided to students to scaffold them engage and reflect on their sustained discussion.

(3) Deepening metadiscourse engagement through KF and classroom practices. Face-to-face classroom discussion and KF discourse were interwined. Students reflected on their idea improvement and community knowledge advancement using Idea Thread Mapper (ITM), a time-line based collective knowledge mapping tool emphasizing on collective reflection (Zhang et al, 2015). In addition, KB principles were introduced to students together with the reflection on KB discourse in the classroom. Students were also asked to identify good clusters of notes in KF and have some metacognitive meetings in reflecting on their discourse. This process made KB principles become explicitly to students which help them engage in the idea improvement with a deeper understanding of the inquiry and discourse.

(4) Writing individual and group portfolio notes on domain understanding and KB discourse. Reflective portfolio assessment focused on asking students to reflect on their learning and discussion progress by selecting some clusters of notes to monitor their domain understanding and track their discussion trajectory (Chan and van Aalst, 2004).

3.3 Data collection and analysis

Multiple sources of data are collected including students' KF participation conducted by an assessment tool, KF notes with content analysis, open-ended questionnaires on discourse understanding and domain knowledge, interview data, and classroom videos. A mixed-method analysis is adopted. Table 1 showed a general information and progress of the dissertation.

Table 1: Data Collection Process.

Study	Class	Pedagogical Design
Exploratory study – finished	1 class Grade 11	Designed KB Environment
Study 1 – ongoing	4 classes Grade 9	Designed KB & Regular KB
Study 2 – not start	1 class Grade 10	Adapted Designed Metadiscourse-oriented KB

4. Preliminary findings and research contribution

Currently, data collection and analysis of exploratory study was finished and data collection of study 1 is still ongoing. Therefore, I reported the preliminary findings of the exploratory study in this proposal. For the RQ 1 in the exploratory study, student who has a higher betweenness centrality detected by KB Discourse Explorer (KBDeX) (Oshima, Oshima and Matsuzawa, 2012) taking the collective responsibility in the community discussion played as a leader role in the pivotal conversation turn which lead to discourse network and keywords structure changed from a segmented to a cohesive discussion. For the RQ 2, interview data showed that students who took the agency in the community discussion had an epistemic understanding of discourse, and students who did not played as a leader had a non-epistemic understanding of discourse (Poster presented at CSCL2017).

In conclusion, the exploratory study indicated that students who had a deeper understanding of discourse would take the agency in their community discussion than students who had a superficial understanding. Based on the results, we tried study 1 to enhance students' metadiscourse emphasizing on discourse understanding and reflection with one designed metadiscourse-oriented KB and one regular KB, as well, further examine the quality of students' collaborative discourse. Later, in the study 2, we plan to try an adapted pedagogical design based on the results and practice of exploratory study and study 1 to enhance students' metadiscourse engagement. The literature on metadiscourse draw much attention on the metacognitive markers in linguistics. Our investigation may shed light on how students' metadiscoruse, specifically the meta-level discourse reflection can be scaffold. Theoretically, this study contributes to the literature on how students' metadiscourse could be enhanced in a computer-supported collaborative learning environment. Practically, we aim to develop a novel pedagogical design which will enhance students' metadiscourse.

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