

Promoting Critical Thinking Skills with Socially Shared Regulation of Learning in Computer Supported Collaborative Learning: A theoretical Framework

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Abstract: This study, under the guidance of social constructivist learning theory, proposes a theory framework that incorporates social shared regulation of learning as the independent variable to promote students' engagement of critical thinking. The proposed theoretical framework is to assist other practitioners to apply socially shared regulation of learning in computer supported collaborative learning environment to enhance students' critical thinking skills.

Keywords: Critical thinking, socially shared regulation of learning, computer supported collaborative learning, theoretical framework

1. Introduction

Critical thinking refers to the purposeful judgmental process with interpretation, analysis, evaluation, inference, explanation and self-regulation (Facione, 1990). Despite its significance for school performance, workplace and personal life (Bassham, 2019; Murawski, 2014), studies (e.g. Gelder, 2005; Xue & Fang, 2019) indicate that there is still a lack of critical thinking skills among students. Computer supported collaborative learning (CSCL) has recently been recognized to help improve critical thinking skills by providing learners with space to share information, express opinions, exchange ideas and make evaluations in group work (Yu, Wang, Huang, & Hu, 2014). Besides, it allows students more time to carry out the deep and reflective thinking (Oh, Huang, Hedayati Mehdiabadi, & Ju, 2018).

However, critical thinking skills are not prevalent in CSCL because students are not able to involve in the effective social interaction spontaneously (Maurino, 2007; Murphy, 2004). The meaningful CSCL requires socially shared regulation of learning (SSRL) (Hadwin, Järvelä, & Miller, 2011). In SSRL, group members jointly plan, monitor and evaluate their learning and thinking process, thus promoting students' involvement in social interaction along with the accomplishment of the learning tasks (Isohäätä, Järvenoja, & Järvelä, 2017). Therefore, this study presents a theoretical framework to promote critical thinking skills with the integration of SSRL in CSCL environment.

2. Literature review

2.1 *Social constructivist learning theory and CSCL*

Social constructivist learning theory, discovered by Vygotsky (1978), emphasized that "social interactions are critical, and knowledge is constructed between two or more people" (Schunk, 2012). CSCL is rooted in social constructivist learning theory (Vygotsky, 1978) in which learners are expected to interact in group to achieve the common learning goal and students acquire more knowledge than learning individually (Udvari-Solner, 2012). It breaks down the limitation of time and space in collaborative learning (Kreijns, Kirschner, & Vermeulen, 2013) and supplies a platform for learners to share and deepen their understanding (Bereiter, 2005).

Based on social constructivist learning theory, the success of CSCL has two premises. Firstly, learners should work as a team. They are engaged in a goal-oriented cognitive process in which they share knowledge and understanding and work on the learning task. Secondly, learners should be positive

with motivation gained from the return of learning outcomes at the cost of time and effort for the interaction with others (Kreijns et al., 2013). This means merely dividing learners into groups and putting them under CSCL environment do not necessarily result in meaningful social interactions for lack of the involvement and responsibility to fulfil the task (Morris et al., 2010). Therefore, SSRL is required in CSCL (Hadwin et al., 2011).

2.2 Socially shared regulation of learning and critical thinking skills

SSRL occurs when group members regulate their learning collectively. Group members continuously adjust their cognition, metacognition, emotion, motivation, behaviour, etc. in the learning process so as to complete the learning task together (Isohäätä et al., 2017). It promotes social interaction among group members in CSCL environment.

SSRL has the metacognitive nature (Järvelä et al., 2014), which is known as the shared metacognition regulation. Metacognition is the cognition of cognition (Flavell, 1979). Shared metacognition involves key regulation skills such as learners' shared task planning, shared task monitoring and shared task evaluation. (De Backer, Van Keer, & Valcke, 2014).

Critical thinking is a cognitive process (Garrison, Anderson, & Archer, 2001) and is supported by metacognition. In CSCL, students have to critically judge each other's argument and reasoning through which their metacognition are shared and SSRL comes into being (Khosa & Volet, 2014).

Current studies on SSRL mainly focus on its effects on promoting students' knowledge construction (Grau & Whitebread, 2012; Zheng, Xing, & Zhu, 2019), group performance (Panadero & Järvelä, 2015) and problem solving (Panadero, Kirschner, Järvelä, Malmberg, & Järvenoja, 2015). The research regarding the effect of SSRL on critical thinking skills in computer supported collaborative learning is still lacking.

3. Theoretical Framework

Drawn from the previous literature research, the theoretical framework discussed in this paper is shown in Figure 1.

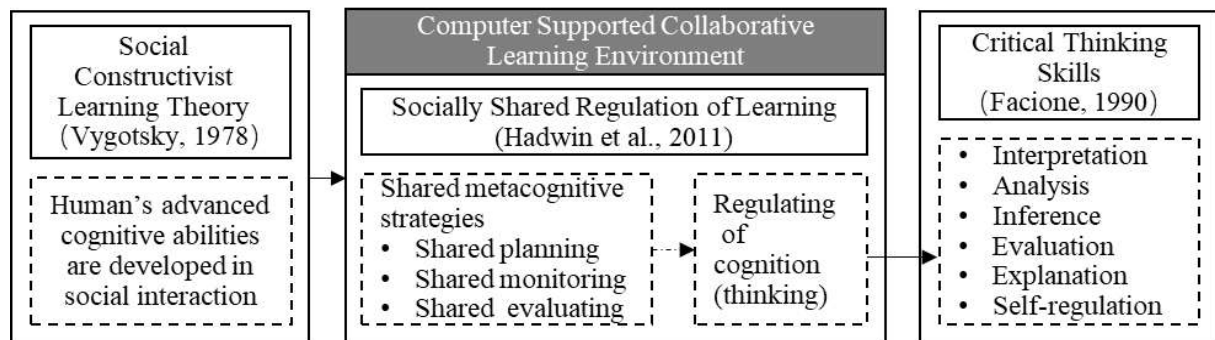


Figure 1. Theoretical framework for promoting critical thinking skills with SSRL in CSCL

4.2 Social constructivist learning theory as the theoretical basis

According to social constructivist learning theory by Vygotsky (1978), human's advanced cognitive abilities (critical thinking skills) are developed in social learning activities. Based on this concept, CSCL environment is used as the social learning setting for students to mutually construct knowledge and thinking (Gauvain, 2020).

In CSCL environment, group members jointly take part in collaborative learning tasks and produce shared meaning and regulation through interactions between group members (Lee, 2014). Its focus lies in the shared outcome rather than the individual's presentation, which is in line with the social constructivist learning theory (Nolen & Ward, 2008).

4.3 SSRL as the independent variable

SSRL occurs in collaborative learning tasks in CSCL environment. As shown in Figure 1, in SSRL, learners deliberately adopt shared metacognitive strategies of planning, and evaluating to regulate their cognition (thinking) (Hadwin et al., 2011).

In shared task planning, learners collectively determine strategies and make plans for solving the problem. Shared task monitoring focuses on the diagnosis and control of learners' perspectives, progress, and collaboration with the aim of identifying inconsistencies in the collaborative learning process and optimizing the execution of collaborative task. Shared task evaluation is the group's comment judgment, mainly focusing on the collaborative evaluation of task results, task processes, and collaboration among the group members (Chen, Luo, & Zhang, 2019; De Backer et al., 2014).

4.4 Critical thinking skills as the dependent variable

This study attempts to propose a theoretical framework to promote students' critical thinking skills. In this study, Facione's model of critical thinking skills (Facione, 1990) is applied because it covers the collaborative learning setting (Facione, 2015) and focuses on the online group interaction (Hussin, Harun, & Shukor, 2019). This model suggests 6 critical thinking skills which are interpretation, analysis, inference, evaluation, explanation and self-regulation.

4.5 Discussion: The interrelationship of social constructivist learning theory, SSRL and critical thinking skill in CSCL

As shown in Figure 1, CSCL environment provides the working space for social learning activities and learners communicate through computer networks with the purpose to achieve the shared learning objective (Kirschner & Erkens, 2013). To co-construct the shared learning outcome, learners are required to collectively regulate their learning by virtue of the shared planning, monitoring and evaluating (Hadwin et al., 2011). While adopting the metacognitive strategies, learners involve in critical discourses that emerge in their interactions and their thinking is regulated. In other words, to reach the shared learning outcome, students need to make analysis and inference, give explanation and interpretation, evaluate and justify different opinions as well as make reflections, which manifest the critical thinking skills. All the above variables center around social interaction which is the gist of social constructivist learning theory that humans learn through interaction with others (Vygotsky, 1978).

This theoretical framework can be potentially used to design CSCL with the aim to promote learners' critical thinking skills. Thus, future research will be carried out to confirm the function of SSRL in the improvement of critical thinking skills.

5. Conclusion

Critical thinking skills are crucial for one's life. Therefore, it is meaningful to probe a theoretical framework aiming at enhancing critical thinking skills. In this study, based on social constructivist learning theory by Vygotsky (1978), SSRL (Hadwin et al., 2011), critical thinking skills (Facione, 1990) are utilized as the variable in the circumstance of CSCL. It is to the benefit of practitioners in designing their teaching and learning in which students' critical thinking skills are fostered in online social learning environment. This theoretical framework will be tested in the real classroom scenario for future work.

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