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Assessing Students' Readiness for CSCL

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Abstract: This paper is based on the work of the author's master thesis, aiming at conceptualizing and assessing students' readiness for CSCL. We designed a framework for assessing students' readiness for CSCL and will conduct questionnaire surveys using this framework. Since the survey data are yet collected at this point, only the theoretical and methodological approaches are reported in this paper.

Keywords: Readiness, CSCL

Introduction

Computer supported collaborative learning (CSCL) is an emerging paradigm in instructional technology concerning with studying how people learn together with the help of computers [4]. Basically, CSCL is the combination of the two ideas of "computer supported" and "collaborative learning".

A great deal of research has been done to figure out what parameters affect the productivity and effectiveness of the CSCL activities [1] [8]. Within those studies, researchers tried to investigate what factors related to students' participation, collaboration satisfaction, and collaboration outcomes .etc, and how those factors related to each other. However, according to an intensive review about the measurements in CSCL, it was pointed out that there was a lack of measurements "before collaboration" as measurements were done dominantly "during collaboration" or "after collaboration" [3]. We may ask "are the students ready for collaboration" before they are engaged in collaborative activities.

Currently, there are a few studies that have investigated students' readiness for online learning [5] [7], whereby technical and self-regulated factors were the main concerns. But regarding learners' readiness for collaboration, what they examined was students' comfort level for electronic communication. This is considered to be not enough to assess a learner's readiness for collaboration in CSCL settings as Stahl [9] pointed out CSCL is different from pure online learning in terms of a larger motivational and interactive context and even face-to-face form of interactions in CSCL settings. Therefore, the criteria for evaluating learners' readiness cannot be generated from online learning to CSCL settings. Since few studies have investigated students' readiness to collaborate in the CSCL context [3], there is a need for the proposed research in this paper, for conceptualizing and assessing students' readiness for CSCL.

As the thesis work is still at the beginning point, only the theoretical and methodological approaches are reported in the following parts. There are three sections in this paper: the first part is the statement of research questions; the second part is to elaborate the theoretical background for this research; and the last part is methodology.

1. Research Questions

Collaboration readiness is a complex concept and may be evolving during the collaborative processes. In this study, we intend to focus on students' readiness before collaborative process in order to get a preliminary understanding. As the measurement will be based on self-reported survey, students' readiness to be measured is actually individual self-perceived readiness for CSCL.

The research questions are as follows: (1) what constructs build on students' perceived readiness for CSCL? (2) How are these constructs related to each other? And (3) whether and how are the demographic and past CSCL experience factors related to students' readiness to collaborate?

The results of this study will help to fill the gap in the understanding of students' readiness for CSCL and providing guidelines for measuring the state of this readiness. It will also assist instructors in designing more appropriate CSCL activities.

2. Theoretical Background

Some studies mainly investigated students' readiness in online learning context [5] [7] [12]. The instruments used in those studies provided a lot of guidelines to assess online learners' readiness, which were mainly from three aspects: (a) technical factors (such as technical access to online resource and technological skills for online communication) [5] [12], (b) self perspectives towards online learning (such as preference and comfort with online learning) [7], and (c) motivational factors (such as self-regulation skills and perceived value of online learning) [5] [12].

Drawing on the previous studies about online learners' readiness, we adapted the technological factors and motivational factors in constructing the readiness for CSCL. Additionally, the collaborative knowledge, skills and abilities (KSAs) were stressed because researchers believe these are the factors important for a successful collaboration to happen [10]. In the following part, these three dimensions (technological readiness, collaboration KSAs readiness and motivational readiness) will be discussed respectively.

2.1 Motivational Readiness

Literature suggests learners' motivation is a powerful predictor for their engagement and achievement in collaborative activities [2] [13]. Motivational readiness is considered as a critical scale to evaluate learners' readiness for CSCL in this study. It provides a method to identify whether learners are psychologically ready for the collaborative activities.

Based on the motivation theories, such as self-efficacy theory, expectancy-value theory and self-determination theory, three dimensions were extracted, self, task and reinforcement [2]. "Self" dimension includes self confidence and interest for collaborative activities; "task" dimension refers to perceived value of collaboration; and "reinforcement" dimension is mainly about external awards or punishments of doing or not doing something.

2.2 Knowledge, Skills and Abilities (KSAs) for Collaboration

The concept of KSAs for collaboration is originally from the work of teamwork KSAs by Stevens and Campion [10] [11]. In 1994, Stevens and Campion proposed a list of criteria to identify participants' levels of teamwork capacities [10]. Mainly drawing on extensive literature on group studies in social psychology, they synthesized 14 specific individual-level KSAs which they believed could identify participants' capacities for

teamwork [10]. Those KSAs were in two major categories, with 5 subcategories [10], which are "conflict resolution KSAs", "collaborative problem solving KSAs" and "communication KSAs" in the dimension of "interpersonal KSAs", and "goal setting and performance management KSAs" and "planning and task coordination KSAs" in the dimension of "self-management KSAs" [11].

This five-factor framework was validated in their follow-up studies, results showing the teamwork KSAs was significantly related to team performance [11]. It was suggested that the teamwork KSAs had both conceptual and practical value in the staffing of teams [11].

KSAs for collaboration is an important construct to evaluate learners' readiness for CSCL, which provides criteria to identify learners' capacities to collaborate through assessing learners' skills of conflict solving, problem solving, communication, goal setting and coordination.

2.3 Technological Readiness

As computer is an inevitable component in CSCL, students should have the abilities and willingness to use it and learn collaboratively with it. Technological readiness was tested in the context of online learning, which focused on three aspects [5] [12]: technological access, basic computer literacy and electronic communication skills. In the context of CSCL, learners' technological efficacy was pointed out to have influences on their collaborative behaviors [6].

In this study, willingness to use ICTs in collaborative learning is added besides general ICT skills to construct students' technological readiness for CSCL, as we believe learners' attitudes towards ICTs are important as well.

Figure 1 describes the constructs of readiness for CSCL. The instruments will be developed based on the framework and the factors included in the framework will be tested out in the next step.

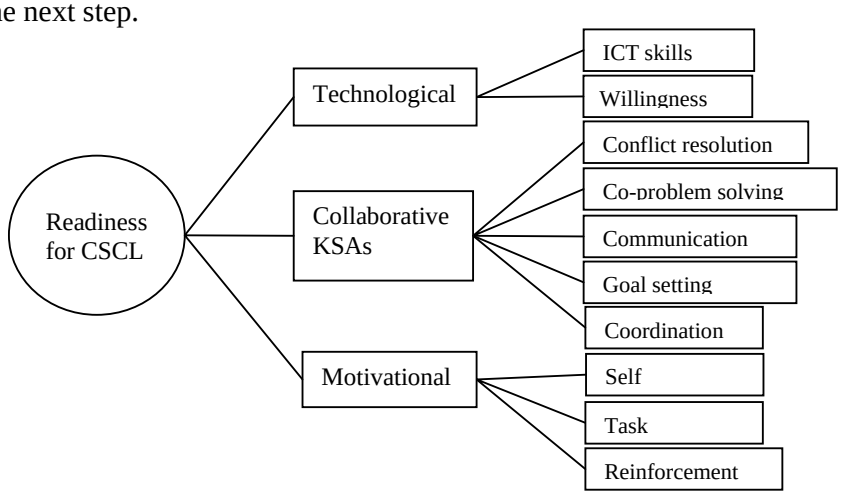

Figure 1. Constructs of Students' Readiness for CSCL

3. Methodology

3.1 Instrument Development Procedures

The instrument development will be carried out in four stages. Item creation is the first stage. The purpose of item creation is to generate items based on the theoretical framework. The second stage is expert validation, whose purpose is to refine the instrument based on experts' views. The third stage is pilot study for validating the instrument statistically. And the main study is the final stage to validate the instrument and test the relationship between factors.

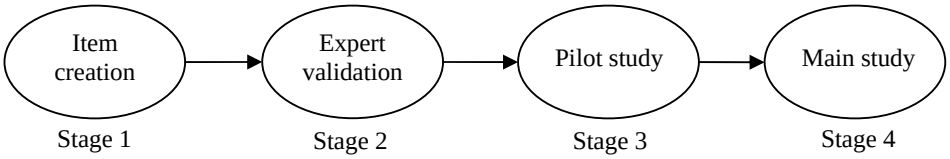

Figure 2. Instrument Development Processes

3.2 Data Analysis Procedures

In the stage of expert validation, comments from experts will be collected and appropriate changes will be made on the instrument based on the comments. Confirmative factor analysis will be conducted for the data collected from pilot study to test the validity of the instrument. In order to check the reliability, internal consistency will be tested as well. Based on the analysis results, questionnaire items will be revised. For the data collected from main study, confirmative factor analysis will be conducted again. In addition, correlation analyses will be conducted to evaluate the relationship between different factors. Analyses of variance will be carried out to test the mean different for different group of students, separated by gender, age or other traits. Based on the analysis results, guidelines will be proposed for evaluation of students' readiness for CSCL.

References

[1] Barron, B. (2003). When smart groups fail. *Journal of the Learning Sciences, 12*(3), 307-359.
[2] Chow, A., & Law, N. (2005). *Measuring motivation in collaborative inquiry-based learning contexts*. Paper presented at the Proceedings of the 2005 conference on Computer support for collaborative learning: learning 2005: the next 10 years!, Taipei, Taiwan.
[3] Gress, C. L. Z., Fior, M., Hadwin, A. F., & Winne, P. H. (2008). Measurement and assessment in computer-supported collaborative learning. *Computers in Human Behavior*.
[4] Koschmann, T. (1996). Paradigm shifts and instructional technology: An introduction. In T. Koschmann (Ed.), *CSCL, theory and practice of an emerging paradigm* (pp. 1-23). NJ: Lawrence Erlbaum.
[5] Pillay, H., Irving, K., & Tones, M. (2007). Validation of the diagnostic tool for assessing "tertiary students' readiness for online learning". *Higher Education Research and Development, 26*(2), 217-234.
[6] Prinsen, F., Volman, M. L. L., & Terwel, J. (2007). The influence of learner characteristics on degree and type of participation in a CSCL environment. *British Journal of Educational Technology, 38*(6), 1037-1055.
[7] Smith, P. J. (2005). Learning preferences and readiness for online learning. *Educational Psychology: An International Journal of Experimental Educational Psychology, 25*(1), 3 - 12.
[8] So, H., & Brush, T. (2008). Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. *Computers & Education, 51*(1), 318-336.
[9] Stahl, G., Koschmann, T., & Suthers, D. (2006). Computer-supported collaborative learning. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 409-425). Cambridge; New York: Cambridge University Press.
[10] Stevens, M. J., & Campion, M. A. (1994). The knowledge, skill, and ability requirements for teamwork: Implications for human resource management. *Journal of Management, 20*(2), 503-530.
[11] Stevens, M. J., & Campion, M. A. (1999). Staffing work teams: Development and validation of a selection test for teamwork settings. *Journal of Management, 25*(2), 207-228.
[12] Watkins, R., Leigh, D., & Triner, D. (2004). Assessing readiness for e-learning. *Performance Improvement Quarterly, 17*(4), 66–79.
[13] Xie, K. U. I., Debacker, T. K., & Ferguson, C. (2006). Extending the traditional classroom through online discussion: The role of student motivation. *Journal of Educational Computing Research, 34*(1), 67-89.