

Activity Systems Analysis of the Social Practices by Low-achieving Students in a Knowledge-Building Environment Augmented by Reflective Assessment

Yuqin Yang, Central China Normal University, yuqinyang0904@gmail.com

Jan van Aalst, The University of Hong Kong, vanaalst@hku.hk

Carol K. K. Chan, The University of Hong Kong, ckkchan@hku.hk

Abstract: This study aimed to understand the dynamics that characterized the social practices developed by low-achieving students in a knowledge-building (KB) environment augmented by reflective assessment (RA), using activity systems analysis (ASA). The participants were a class of 20 Grade 11 low-achieving students working with an experienced teacher. Various classroom data was collected and analyzed. Findings indicated that, the students' activities were mediated by: opportunities for collective reflection, the framing of data-driven collective discourse improvement and the development of new skills and interests. Pedagogical implications for future implications were also discussed.

Introduction

This study aimed to use ASA (Yamagata-Lynch, 2010) to analyze the social practices developed by low-achieving students, and to understand the dynamics and tensions that characterized the social practices. The study was part of a larger study that investigated the design, process and effects of KB environments augmented by RA on low-achieving students. The following research questions were investigated:

- 1) What was the nature of social practices from a cultural historical activity theory (CHAT) perspective?
- 2) What were the characteristics of the social practices from a CHAT perspective, and how did these characteristics develop?

Methods

The study was conducted at a Band-3 school in Hong Kong. The participants taking a visual-arts course inquired the topic of "design" with one-hour lesson each week in five months. The teacher used a three-phase pedagogical process to familiarize the students with knowledge building, as described in detail by Yang, van Aalst, Chan, & Tian (2016). We analyzed the following five interrelated sets of qualitative data: classroom observations, artifacts of students' work, interviews and questionnaire by using ASA.

Results

We constructed two activity systems to describe and explain the development of the reflective-assessment activities and the interaction of these activities (a) before the KCA student activity, and (B) during the KCA student activity. The activity systems are shown in Figures 1-2.

In Activity System A, the use of these tools motivated some of the students to contribute more notes, and helped them to understand that knowledge building is a collective effort to improve ideas. However, these experiences of reflection directed the students' attention to their own performance. This activity system had two tensions: (a) attaining the objective while completing SBA projects; and (b) attaining the objective with limited resources. After the introduction of the KCA, the dynamics of the student activity systems changed, as the participating students attempted to advance their KB discourse by carrying out RA afforded by the KCA. Tension (b) in Activity System A (created by the need to attain the objective in the absence of a community-oriented framework for data-driven idea improvement) was also substantially alleviated by the students' engagement in productive reflective assessment scaffolded by the KCA prompt sheets. However, prior experience of reflection around the ATK and Applets data in Activity System A and the limited framing of data-driven (the KCA data) discourse improvement as a collective responsibility exerted some negative effects on Activity System B that was some students' attention mostly on individual performance rather than community's discourse as a whole. These resources mediated against the students' productive use of the KCA data and made tension (b) in Activity System A persisted to some degree in Activity System B.

The ASA yielded three main findings that explained the nature, dynamics and tensions of the social practices that arose from the students' KCA-afforded self-directed reflective assessment. These findings offered insights into the elements that became influential cultural tools, and the ongoing activities that supported the transformation of these newly introduced artifacts into cultural tools: (1) *the new tools that mediated student*

activities developed from reflection opportunities afforded by data; (2) framing discourse improvement as a collective responsibility acted as new tools that mediated new activities; and (3) new skills and increased interest were transformed into new tools that mediated the students' new activities.

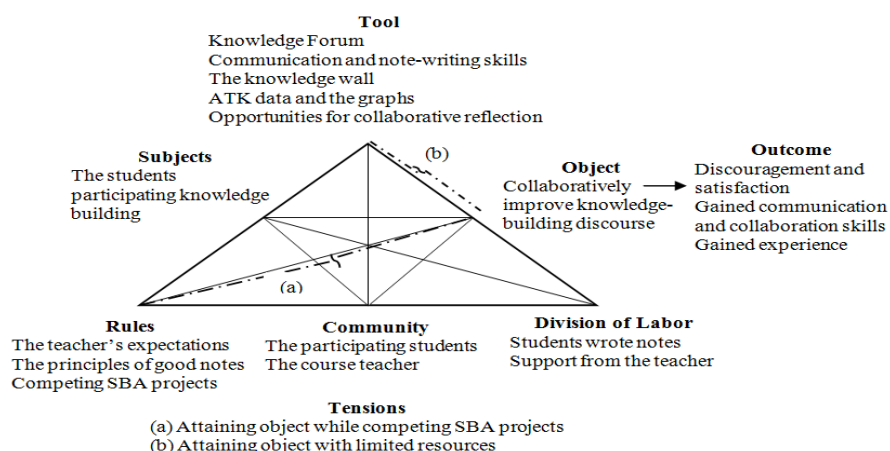


Figure 1. Activity System A: Before the KCA student activity.

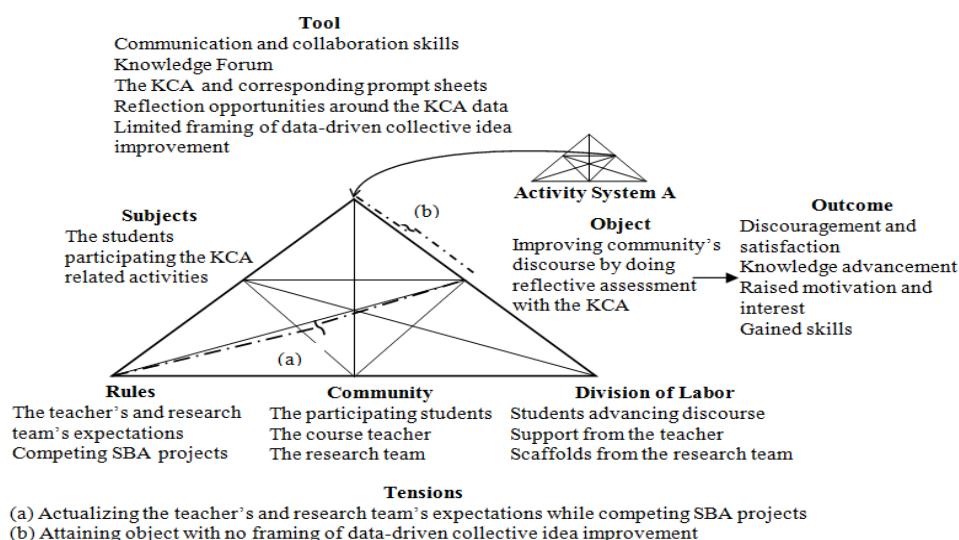


Figure 2. Activity System B: After the KCA student activity.

Discussion and conclusions

We found that the KCA and its accompanying prompt sheets can help students to engage in productive reflective assessment—focusing on the key learning goals of knowledge building. Our findings on the interactions between the conditions of and tensions within an activity system, and the processes by which such factors become either affordances or constraints to students' collaborative use of data, suggest ways of structuring change in classrooms and even schools, particularly to meet the needs of educationally disadvantaged students. The findings also lay the groundwork for future research on students' collaborative work and metacognitive activities in relation to data use.

References

- Yamagata-Lynch, L. C. (2010). *Activity systems analysis methods: Understanding complex learning environments*. New York, New York, N.Y. : Springer.
- Yang, Y., van Aalst, J., Chan, C. K. K., & Tian, W. (2016). Reflective assessment in knowledge building by students with low academic achievement. *International Journal of Computer-Supported Collaborative Learning*, 11, 281-311. (SSCI)