Culture and Mathematical Cognition

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Although there is no universal agreement as to whether mathematics is a culturally bound subject, few would disagree that the teaching and learning of mathematics is a cultural activity. The view of mathematics teaching and learning as a socio-cultural activity is reflected in and supported by various studies (e.g., Boaler, 2000; Stigler & Hiebert, 1999). Although researchers with different research perspectives tend to agree that both socio-cultural factors and individual cognition are two inseparable parts in the development of students' mathematical cognition, the nature of culture and mathematics cognition and the relationships between them are far more complicated than we may think of. As one further step towards a better understanding of culture and mathematical cognition, this discussion group is proposed to use cross-system studies as examples to examine relevant issues.

The discussion group will be organized as a two-section activity. During the first section, two researchers will present brief (10 minutes each) overviews and/or examples of relevant research on two issues: (1) the ways of assessing students' mathematics thinking, and (2) the nature and quality of mathematics curriculum and teaching in different settings. After the presentations, the participants will be organized to join small group discussions that will constitute the second section. Based on cross-system studies that have been discussed in the first section, the discussion in small groups will center on the following four questions:

1. Can mathematical cognition be examined cross-culturally?
2. Are cultural variations in context, tools, and practices (e.g., curriculum, teaching practices) related to the development of students' mathematical cognition?
3. Can a cultural practice be adapted in a different setting?
4. What similarities and differences may exist between cross-system studies and multi-cultural studies within an education system in understanding the issues relevant to culture and mathematical cognition?

After small group discussions, all participants will come together to generate a collective summary and synthesis of the small group discussions. A list of potential research questions will be generated/selected and interested participants will be organized to develop further research activities on this topic after the meeting.

References

Boaler, J. (2000). Exploring situated insights into research and learning. Journal for Research in Mathematics Education, 31, 113-119.

Stigler, J. W., & Hiebert, J. (1999). The teaching gap: Best ideas from the world's teachers for improving education in the classroom. New York: Free Press.