# Teachers' Beliefs about Knowledge and Learning:
# A Singapore Perspective

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**Abstract**: The purpose of this study is to explore the complex nature of Singapore teachers' beliefs about knowledge and learning and how these beliefs influence pedagogical practices in their classes. This paper presents findings from a large-scale survey study with 1806 teachers in Singapore. Data revealed that while teachers' beliefs about pedagogies, knowledge and learning were largely consistent, they also believed and practiced both teacher-centered and learner-centered pedagogies and assessment methods.

## Introduction

In the area of Learning Sciences research for the past decade, there has been an increasing interest about the role of epistemology for teaching and learning. Prior research suggests that specific types of beliefs teachers have about the nature of knowledge and learning influence decisions that teachers make about curriculum, pedagogy, and assessment (Gregory Schraw & Olafson, 2002). Other research suggests that there may be a relationship between the pedagogical approach a teacher employs, the ways she or he uses technology in the classroom, and characteristics of the overall school culture (Riel & Becker, 1999). The purpose of this study, therefore, is to explore the complex nature of teachers' beliefs about knowledge and learning and how these beliefs influence pedagogical practices in their classes. This paper presents findings from a large-scale survey study with 1806 teachers from 51 schools in Singapore.

## Methods

To investigate the research questions, the online *Beliefs, Teaching, and Technology* (BTT) survey was developed that employed the following inventories:
1. *Epistemic Beliefs*: 32 item Epistemic Beliefs Inventory (EBI) (G. Schraw, Bendixen, & Dunkle, 2002)
2. *Learner- and Teacher-centered Pedagogies*: 19 and eight items respectively (Center for Research of Pedagogy and Practice [CRPP], National Institute of Education, Nanyang Technological University, Singapore).
3. *Constructivist and Assessment Practices:* 15 and seven items respectively (Becker & Anderson, 1998)

For the survey used in the main study, 31 items were excluded from the pilot survey as they were found to be not useful to the aims of the study. Teachers from the participating schools could complete the survey in approximately 30 minutes, using the Internet-connected Web browsers.

## Results

A major finding in the survey was related to the nature of epistemic beliefs held by teachers in Singapore. Our original premise of epistemic beliefs was consisting of five distinctive dimensions, as proposed by Schraw, Schommer, and their associates (Schommer & Walker, 1995): Simple Knowledge, Certain Knowledge , Omniscient Authority , Innate Ability, and Quick Learning. However, as pointed by Hofer and Pintrich (1997), the factors of Innate Ability and Quick Learning deal with learning, not with the construct of epistemic beliefs. The results from our survey data revealed two factors associated with *epistemic beliefs*: Simple Knowledge and Certain Knowledge; and two factors with *learning*: Innate Ability and Quick Learning. However, Omniscient Authority was not a factor that emerged in our analysis (possible reasons being cultural differences between Singapore and other countries; other research needs to investigate this issue). Overall, the results from our survey study seem more consistent with the factors proposed by Hofer and Pintrich (1997), which distinguished epistemology from learning.

Correlations were conducted on teachers' beliefs in knowledge and learning, their beliefs about pedagogies and assessment, and pedagogical practices. We found that less sophisticated beliefs about knowledge and learning were positively correlated to the beliefs about transmissionist pedagogies ($r(1742) = .46$ and .48 respectively, p < .001). The relationship between simple epistemic beliefs and beliefs about traditional assessments and teaching methods were small but positive. Teachers with more simple beliefs about knowledge also believed in the usefulness of traditional assessment ($r(1682) = .10$, $p < .001$) and the use of teacher-centered pedagogies($r(1682) = .18$, p < .001). On the relationships about beliefs in pedagogy and assessment, and pedagogical practices, results expectedly showed that beliefs in transmissionist pedagogies correlated positively with the beliefs in the usefulness of standardized assessments and the use teacher-centered methods. However,

the correlations also showed that teachers who reported using more learners' centered pedagogical practices also used as much teacher-directed teaching methods ($r$ (1783) = .37, p < .001). Regarding overall school environments, a school culture that emphasized on shared goals and collaboration is positively related to innovation practices ($r$(1611) = .76, p < .001), learner-centered pedagogies among students ($r$(1609) = .43, $p$ < .001), and higher order learning ($r$(1609) = .41, p < .001) and. Schools that encouraged the staff to engage in student higher-order learning encouraged student –centered learning ($r$(1611) = .67, $p$ < .001) and, interestingly, content-driven instruction ($r$(1611) = .45, p < .001) as well.

## Conclusions

In summary, teachers who believed less in omniscient authority, simplicity, and certainty about knowledge were less likely to believe in transmissionist pedagogies, engage less in teacher-centered teaching methods, and believe less in the utility of traditional standardized assessments and more in criteria based assessments. Teachers who were less inclined to subscribe to "quick learning" and "innate ability" beliefs also believed less in transmissionist pedagogies, engaged less in conventional teaching and more in learner-centered practices, and believed more in criteria based assessments. However, contrary to expectations, the latter also had slightly positive views towards standardized assessments. Examination of the relationships also showed teachers in Singapore practiced a mix of teacher and learning centered teaching methods, and believed both in the usefulness of criteria-based and standardized assessment methods. Hence, while teachers' beliefs about pedagogies, knowledge and learning were largely consistent (i.e., teachers' with more complex epistemologies had more learner-centered beliefs and pedagogies), they also believed and practiced both teacher-centered and learner-centered pedagogies and assessment methods. The educational importance of the present study is that it provides international perspectives on the complex relationships of epistemic beliefs that teachers have about pedagogy and assessment methods.

## References

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