Teachers' Beliefs and Use of ICTs in Malaysian Smart Schools: a case study

Seri Rahayu Hamid
School of Education
University of Queensland

This preliminary study investigated Malaysian secondary *Smart School* teachers' beliefs about ICTs and how they are used in their classrooms. Using a case study design, data were collected from focus group interviews with 31 Science, Mathematics and English teachers from three Malaysian secondary schools, and from journals of three students. Results showed that although these teachers held positive beliefs about ICTs in education, these beliefs were not fully translated into their classroom practices. Most of them believed that ICT was just a tool to use in teaching and learning, particularly if it eased knowledge dissemination, and helped students to understand the content. The analysis revealed early career teachers were using ICTs in more varied ways than the more experienced teachers. Many of these early career teachers communicated with their students through blogs and online groups; practices that were rare among the more experienced teachers.

Keywords: ICTs, teacher beliefs, teacher practices

Introduction

Despite the increasing availability of infrastructure and equipment, teachers' use of ICTs, as reported in numerous recent studies, has been limited (Eteokleous, 2008; Lim & Chai; 2008; Nichol & Watson, 2003; Reynolds, Treharne, & Tripp, 2003; Sandholtz & Reilly, 2004; Smeets, 2005). In some studies of the extent of successful ICT use in classrooms, teachers were not fully using ICT in teaching and learning (Eteokleous, 2008; Nichol & Watson, 2003; Reynolds, et al., 2003; Sandholtz & Reilly, 2004), even when their schools were fully equipped with technology (ChanLin, Hong, Horng, Chang, & Chu, 2006; Zhao, Pugh, Sheldon, & Byers, 2002).

Teachers have often cited the inadequacy of ICT equipment and resources (Bauer & Kenton, 2005; ChanLin et al., 2006; Zhao et al., 2002), and the lack of adequate knowledge and skills (Brummelhuis & Kuiper, 2008; ChanLin et al., 2006; Eteokleous, 2008; Yang & Huang, 2008) as significant factors contributing to their limited use of ICTs in the classroom. However, Hokanson and Hooper (2004) suggested that the real challenges to teachers' uses of ICTs are pedagogical, curricular, and methodological. And to advance into higher levels of ICTs integration in teaching and learning, changes in teachers' beliefs are required (Hixon & Buckenmeyer, 2009).

Previous research has indicated that teachers' beliefs about ICT play a significant role in determining teachers' ICTs use (Ertmer, 2005; Ravitz, Becker, & Wong, 2000;Windschitl & Sahl, 2002), affecting their intentions to use ICTs in the classroom (Goos, Galbraith, Renshaw, & Geiger, 2003; Jimoyiannis and Komis, 2007), and the ways teachers choose to use ICTs in the classroom (Ruthven, Hennessy & Brindley, 2004). This study aims to build on this knowledge by examining teachers' beliefs and how they affect ICTs use in the classroom in the Malaysian context. The following research questions guided the study:

1. How are ICTs being used for teaching and learning of Science, Mathematics and English in the Malaysian secondary *Smart Schools*?
2. How do teachers' beliefs affect their use of ICTs for teaching and learning of Science, Mathematics and English in the Malaysian secondary *Smart Schools*?

Method

Participants

This study recruited teachers from three subject areas as participants. They were 31 teachers of Science, Mathematics, and English from three secondary *Smart Schools* in Kuala Lumpur and Putrajaya, Malaysia. Two Form Five students and one Form Four student were recruited (one from each school). These 31 teachers were divided into nine focus groups. Each school had a separate focus group for English teachers, Science teachers, and Mathematics teachers respectively. The number of teachers per group varied from three to five, depending on the availability of teachers at interview time. Only three teachers were male, while the rest were female. Their teaching experience varied from 4 months to 25 years. The majority of the participants held a bachelor's degree. Three held a master's degree and one held a diploma in education.

Data sources

This study adopted a case-study approach to explore the interaction between Malaysian secondary *Smart School* teachers' beliefs about ICTs and how ICTs are used in their classroom. It involved the use of focus groups and document reviews as main sources of data. Focus groups were used to understand the underlying beliefs that influenced those teachers' uses of ICTs for teaching and learning in specific subjects. A focus group protocol was developed and used to guide the discussions, and all focus groups were recorded and transcribed.

To provide an alternative perspective of how ICTs were used on a daily basis in the classrooms three students' daily journals were also used as a data source. These journals provided daily snapshots of how ICTs were used for the teaching and learning of Science, Mathematics and English in these schools. The students were provided with a bound set of journal entries templates which served as a guide to structure their responses.

Analysis

The data were first coded according to their sources and the research questions. Data analysis consisted of within-case analysis and cross-case analysis (Merriam, 2009). The within-case analysis took place first. For each school, the associated focus group discussions and student daily journal entries were analyzed to develop a rich description of the case. In order to understand the different uses of ICT observed in this study, the classifying scheme by Means (1994) was adopted. Means classified technologies according to how they are used for teaching and learning namely Tutorial, Exploratory, Tool, and Communication. The categories were applied to highlight differences in the instructional purposes of various technology applications. Following the within-case analysis, the cross-case analysis was carried out, exploring the similarities and differences among the three schools with regards to the research questions.

Findings

A significant finding of the preliminary study was that the teachers in the study generally held positive beliefs about the use of ICTs in education. Despite that, their focus on preparing their students for national examinations resulted in them viewing ICTs as tools that could help speed up or simplify the delivery of their teaching content. This led to the significant use of ICTs as presentation tools. However, further analysis showed that the early career teachers of the three subjects used ICTs in much more varied ways compared to their more experienced colleagues. These younger teachers used blogs, e-mails, online groups, online teaching, YouTube, Skype and movies, while the more experienced teachers preferred to employ the traditional, lecture-style teaching and learning method by utilizing mainly PowerPoint presentations and the teaching courseware.

Discussion

The findings from the preliminary study suggest that the teachers' different beliefs and practices regarding the use of ICTs in the teaching and learning of their subject should be further investigated. This may provide a deeper understanding about how teachers can share and learn from each others' differences to promote greater uses of ICTs for teaching and learning. These findings led to a more in-depth study which aims to investigate how early career and more experienced teachers can co-mentor each other to influence beliefs, ICTs practices and pedagogical practices.

References

Bauer, J., & Kenton, J. (2005). Toward technology integration in the schools: Why it isn't happening. *Journal of Technology and Teacher Education*, 13(4), 519-546.

Brummelhuis, A. T., & Kuiper, E. (2008). Driving forces for ICT in learning. In J. Voogt & G. Knezek (Eds.), *International Handbook of Information Technology in Primary and Secondary Education* (pp. 97-111). New York, NY: Springer Science+Business Media, LLC. https://doi.org/10.1007/978-0-387-73315-9_6

ChanLin, L. J., Hong, J. C., Horng, J. S., Chang, S. H., & Chu, H. C. (2006). Factors influencing technology integration in teaching: A Taiwanese perspective. *Innovations in Education and Teaching International*, 43(1), 57-68. https://doi.org/10.1080/14703290500467467

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development*, 53(4), 25–39. https://doi.org/10.1007/BF02504683

Eteokleous, N. (2008). Evaluating computer technology integration in a centralized school system. *Computers and Education*, 51(2), 669-686. https://doi.org/10.1016/j.compedu.2007.07.004

Goos, M., Galbraith, P., Renshaw, P., & Geiger, V. (2003). Perspectives on technology mediated learning in secondary school Mathematics classrooms. *Journal of Mathematical Behavior*, 22(1), 73-89.

Hixon, E., & Buckenmeyer, J. (2009). Revisiting technology integration in schools: Implications for professional development. *Computers in the Schools*, 26(2), 130-146.

Hokanson, B., & Hooper, S. (2004). *Integrating technology in classrooms: We have met the enemy and he is us*. Paper presented at the Annual Meeting of the Association for Educational Communications and Technology. Chicago, IL.

Jimoyiannis, A., & Komis, V. (2007). Examining teachers' beliefs about ICT in education: Implications of a teacher preparation programme. *Teacher Development*, 11(2), 149-173.

Lim, C. P., Chai, C. S. (2008). Teachers' pedagogical beliefs and their planning and conduct of computer-mediated classroom lessons. *British Journal of Educational Technology*, 39(5), 807-828.

Means, B. (Ed.). (1994). *Technology and education reform*. San Francisco, CA: Jossey Bass.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.

Nichol, J., & Watson, K. (2003). Rhetoric and reality – the present and future of ICT in education (Editorial). *British Journal of Educational Technology*, 34(1), 1–6. https://doi.org/10.1111/1467-8535.00315

Ravitz, J., Becker, H., & Wong, Y. (2000). *Constructivist-compatible beliefs and practices among U.S. teachers*. Irvine, CA: Center for Research on Information Technology and Organizations.

Reynolds, D., Treharne, D., & Tripp, H. (2003). ICT: The hopes and the reality. *British Journal of Educational Technology*, 34(2), 151–167. https://doi.org/10.1111/1467-8535.00317

Ruthven, K., Hennessy, S., & Brindley, S. (2004). Teacher representations of the successful use of computer-based tools and resources in secondary-school English, mathematics and science. *Teaching and Teacher Education*, 20(3), 259–275. https://doi.org/10.1016/j.tate.2004.02.002

Sandholtz, J. H., & Reilly, B. (2004). Teachers, not technicians: Rethinking technical expectations for teachers. *Teachers College Record*, 106(3), 487–512. https://doi.org/10.1111/j.1467-9620.2004.00348.x

Smeets, E. (2005). Does ICT contribute to powerful learning environments in primary education? *Computers and Education*, 44(3), 343-355. https://doi.org/10.1016/j.compedu.2004.04.003

Windschitl, M., & Sahl, K. (2002). Tracing teachers' use of technology in a laptop computer school: The interplay of teacher beliefs, social dynamics, and institutional culture. *American Educational Research Journal*, 39(1), 165–205. https://doi.org/10.3102/00028312039001165

Yang, S. C., & Huang, Y. F. (2008). A study of high school English teachers' behavior, concerns and beliefs in integrating information technology into English 84 instruction. *Computers in Human Behavior*, 24(3), 1085–1103. https://doi.org/10.1016/j.chb.2007.03.009

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. L. (2002). Conditions for classroom technology innovations. *Teachers College Record*, 104(3), 482-515. https://doi.org/10.1177/016146810210400308