Can concept maps capture teacher learning using ICT, and the causality of teacher change? A comparative longitudinal study of teachers in Saudi Arabia and the UK.

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Abstract

This paper reports a five-year longitudinal study of teachers' use of ICT in two countries: Saudi Arabia and the United Kingdom. Teachers in both countries were interviewed about their use of Information and Communication Technology, using an adapted form of concept mapping that attempted to capture not only the teachers' use of ICT, but how and why that use developed. Finally, the question of the extent to which interviews and concept mapping can enable researchers to capture the deeper level structures of teacher learning and teacher knowledge was raised.

Key words: ICT, concept maps, interviews, teacher change

Introduction

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The use of Information and Communication Technologies in schools has become more common over much of the more developed world. As this technology develops into more of a force at the turn of the century, it becomes more of a challenge for the teacher who has to make the educational experience of our children engaging and interesting and worthwhile.

> *"We have to prepare for the radically different world of the 21st century. Information and Communications Technology has the potential to transform educational opportunity, raise standards for pupils and prepare them much more effectively for work. It is the way to ensuring a confident workforce at the cutting edge of change" (BECTa, 1999)*

A substantial change occurred with the sudden occurrence of computers in the twentieth century. Nowadays most people around the world cannot go without using a computer in work, businesses, schools and companies.

> *"Widespread change associated with new information technologies is an aspect of globalization. In the globalised economy of 'the information age', new technologies play a key part". (Fisher, Higgins, & Loveless, 2006, p6)*

Technology is transforming teaching and learning or as Toffler calls it the "*Third Wave*" or that we are "*the children of the next transformation*". (Toffler, 1980, p.23) We need to improve by moving into a changing world of the 21st century and "*not step back from New Labour but step up to a new mark, a changing world is setting for us*". (Tony Blair, 2005)

> *"The ICT in Schools Programme is the Government's key initiative to stimulate and support the use of information and communications technology (ICT) to improve standards and to encourage new ways of teaching and learning."(Becta, 2002)*

As in the UK, Saudi Arabia has played an important role in this changing world of technology. Policies are continuing to be developed by the Saudi government to support the development and transformation of Saudi Arabia into an information and knowledge society by promoting the use of Information and Communication Technology (ICT). (ESCWA, 2007) The former Minister of Education in Saudi Arabia, Dr. Muhammad Bin Ahmed Al-Rasheed expresses the assertion that:

> *"The computers role in teaching children has become one of the most important educational means due to its interactive and attractive features." (Al-Rasheed, 2006)*

The research to be reported in this paper considers the effectiveness of concept maps as a tool to enable teachers to represent some aspects of their understanding of Information and Communication Technology in relation to both their teaching and their own professional development. What this paper will report is a comparative study conducted in two innovative local authorities in the U.K. and in a number of private schools in Saudi Arabia.[1] The main research question for this study is '*Have teachers changed during the years of this*

study in relation to how they conceptualize the use of Information and Communication Technology in their teaching, and in education, and if they have, what were the causes of that change'?

This study is a comparative one between two different countries, England and Saudi Arabia. Having looked at a number of different issues, the issue that this study will focus on is teacher change and what teachers select as their goals and strategies for using computers in the classroom. The reason for doing this study is the substantial development of Information and Communication Technology in the area of education in the world, and the use of computers in teaching. This area is developing at dramatic speed, especially in everyday use.

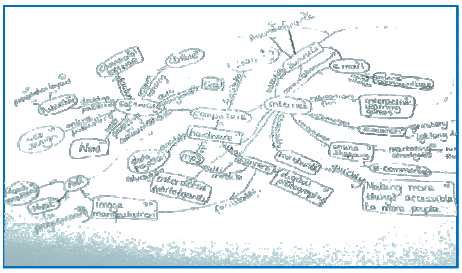

Figure 1- UK teacher's concept map

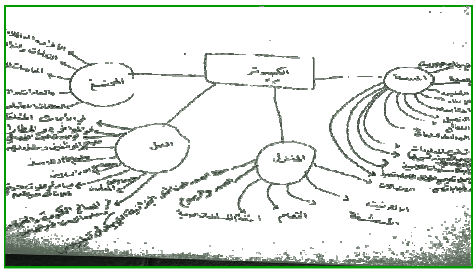

Figure 2- SA teacher's concept map

This paper reports a five-year longitudinal study of teachers' use of ICT in both countries being studied. Attrition, due to teachers moving to new schools or school districts, reduced the number of participants in this longitudinal study from 30 to 14 teachers in the UK and from 45 to 15 in Saudi Arabia. These teachers were interviewed at least three times about their use of ICT, using an adapted form of concept mapping (Figures 1 & 2 above) that attempted to capture not only the teachers' use of ICT, but how and why that use developed. Teachers revisited concept maps that they had drawn to represent their understanding of *'Computers in today's world'* and *'Computers in education'*, and augmented them, updating their maps in successive interviews to show both their new uses of technology, and their new implementation of ICT in their classrooms and professional lives.

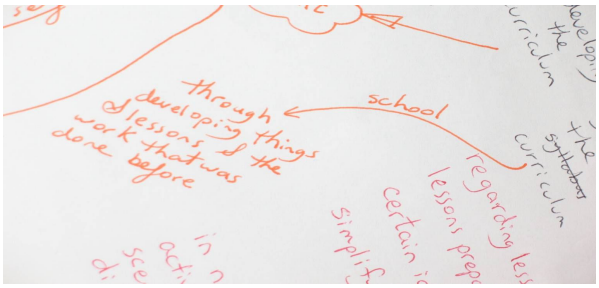

Figure 3- Causal factor for change in a concept map

In subsequent interviews, the teachers were asked if they could identify the causal factors (Figure 3 above) that had led to their changed understanding and pedagogy. In most cases teachers were able to do this, and cited extrinsic factors such as the need to keep up with other teachers, or because the school principal wanted every teacher to implement ICT, or intrinsic factors such as increased confidence that had come from self-directed learning, for example in programming or course development. Many UK teachers cited professional development courses as leading to changes in their practice, while in Saudi Arabia CPD was much less developed, and teachers were more reliant on personal motivation or professional pressure to change and learn. Finally, we raise the question of the extent to which interviews and concept mapping can enable researchers to capture the deeper level structures of teacher learning and teacher knowledge. Pearson and Somekh highlight how useful the method of a concept map is:

> "Concept mapping appeared to be a good method for investigating children's representations of ICT" (Pearson and Somekh, 2000, p.3).

This study is important due to the fact that it might help educational authorities to understand how to help in this endeavour. Teacher training and staff development is ongoing in many ways in both the countries being studied. Ways to enhance and encourage the various educational organizations to realize the importance of this training are needed and hopefully this study will make a contribution by exploring these issues.

> *"We have said for some time now that, if technology is used properly in the classroom, it can help to produce a major improvement in results — not just in academic achievement, but also in involvement, attendance and in the overall efficiency of the institution," (Crowne, 2007)*

References

BECTa (1999). An Introduction. In B. E. C. a. T. agency (Ed.). Coventry.

Tony Fisher, C. H., Avril Loveless (2006). Teachers Learning with Digital Technologies: A review of research and projects (No. 14). Bristol: Futurlab Series.

Toffler, A. (1980). The Third Wave. London: Pan Books Ltd. and William Collins Sons & Co. Ltd.

Blair, T. (2005). Tony Blair's conference speech; http://www.guardian.co.uk/uk/2005/sep/27/labourconference.speeches/print [Accessed Jan 2009]

Becta (2002). Impact2 Pupils' and Teachers' Perceptions of ICT in the Home, School and Community. London.

(ESCWA), E. A. S. C. F. W. A. (2007). *NATIONAL PROFILE OF THE INFORMATION SOCIETY IN THE KINGDOM OF SAUDI ARABIA*. Retrieved September 13, 2008. From http://www.escwa.un.org/wsis/reports/docs/KSA-07-E.pdf

Dr. Muhammad Bin Ahmed Al-Rasheed, F. M. o. E. i. S. A. (2006). In M. Hashim (Ed.). Jeddah: Ministry of Education.

Pearson, M., & Somekh, B. (2000). Concept Maping as a Research Tool: A Study of Primary Children's Representations of Information and Communication Technologies(ICT). Paper presented at the The British Educational Research Association Conferance.

Crowne, S. (2007). Becta touts benefits of ICT for schools Retrieved from http://news.zdnet.co.uk/itmanagement/0,1000000308,39287717,00.htm