Future directions in ITEM research

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Future Directions in ITEM Research

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Abstract: A good deal of ITEM research has been undertaken and reported over the ten years since IFIP WG 3.7 first met. It now appears that use of ICT is becoming mature in educational management in developed countries. The same is not yet true, however, of developing countries and further research is needed to identify problems faced by these countries. Much past research in school implementations of ITEM systems has made use of the Visscher model, but the group thought that this model now needed some updating. This paper outlines these issues and points to several future directions for ITEM research.

Key words: Educational management, information technology, research.

1 INTRODUCTION

Over the ten years that the ITEM working group has been meeting since the Jerusalem conference a good deal of ITEM research has been undertaken and reported. This paper outlines what the above focus group saw as useful future directions for ITEM research. It begins with an outline of recently reported ITEM research, and research directions identified in this.

It appears that the use of information and communications technologies (ICT) is becoming mature in educational management, and that what is now required is the identification of what is 'good management in education': case studies of lighthouse schools and educational managers. Another area of interest identified by the group was the implementation of ITEM systems in developing countries, and whether cross-cultural factors are of significance. ITEM systems have been implemented in educational institutions of all types, and research can usefully be undertaken for each of the following:

- Government primary schools.
- Government secondary schools.

- Non-government (independent) schools.
- Universities and other institutes of higher education.
- Central education systems vs. decentralized education systems.
- Developing vs. developed countries.

Visscher's model (1995) for the implementation of ITEM systems in schools has been referenced by a number of papers over the years, but the group felt that it was now time to attempt an explanation of these results in an attempt to move towards cause and effect. Another identified avenue of future research relates to the adoption of ITEM systems: to what degree are they actually used and infused into individual schools? Also, what can we learn from business management practice in the use of computers? The remainder of this paper explores these issues and outlines an ITEM research agenda for the future.

2 PREVIOUS ITEM RESEARCH

A good deal of ITEM research has already been done, particularly as related to the use of ITEM systems in schools. Application of the Visscher model (Visscher 1995) to ITEM implementations in schools has been an important direction here. Recent research in use of ICT in educational management includes a number of strong themes. These include:

- Use of models to determine the factors of successful use of information systems (Fung 1995), (Fung and Visscher 2001), (Visscher 2001), (Visscher, Wild, Smith and Newton 2003), (O'Mahony 2000), (Stevenson 1997), (Visscher and Bloeman 1999).
- The factors involved in ICT in schools in developing countries (Aguti 2002), (Bisaso 2003), (Kereteletswe and Selwood 2003), (Riggs 1964).
- The ICT support needs of school managers (Haughey 2003), (Fulmer and Frank 1997), (Tatnall and Davey 1995).
- Change management strategies for implementing ICT in school management (O'Mahony 2002), (Selwood, Smith and Wisehart 2000).
- Applications of adoption models to uptake of ICT in school management (Cox, Preston and Cox 1999), (Mumtaz 2000), (Fung 1997).
- Strategies for developing and extending information systems in educational management (Lawrence Shah and Golder 1997), (Tatnall 2001), (Kirkman 2000), (Smith and Wild 2001)

- Evaluation of the effects of ICT system use by managers (Newton and Visscher 2003), (Visscher 1995), (Tatnall 1995), (Tatnall and Pitman 2003), (Telem and Barta 1997).
- Interactions between web based educational delivery systems and new management requirements (Baker 2003), (Alavi 1994), (Althaus 1997), (Webster and Hackley 1997), (Song Singleton and Hill 2004), (Okamoto 2001), (Okamoto, Cristea and Kayama 2000), (Kayama and Okamoto 2002).
- Quality requirements for the use of ICT in educational management (Roffe 2002).
- Issues relating to primary schools.
- Issues relating to teacher education.
- Special issues relating to Universities (Bates 2000), (Davey and Tatnall 2003), (Lieblein 2000), (McGorry 2003), (Pond 2001).

3 DEVELOPING NATIONS: IMPLEMENTATION AND USE OF ITEM SYSTEMS IN SCHOOLS

Most developed countries now have in place some form of ITEM system for use in school education, and there was discussion on how developing countries might be able to benefit from the collected experience of these countries. The basic research question asked was: "What should an educational administrator in a developing country be advised to do next in relation to implementation of ITEM systems?"

One important issue that should be researched, for each country, concerns the alignment of information and communications technologies with the business directions determined by the Ministry of Education, and what processes are available for determining this alignment. This could be informed by research into what is best practice in determining ITEM priorities in other countries, and what are the methods best suited to avoiding producing systems that will not meet the needs of *all* their potential users. The hope is that this research will point towards a determination of implementation strategies that are best suited to developing countries.

Another interesting research question identified was: how does government structure influence the direction of ITEM development? Related to this are issues of centralized versus decentralized education systems and how these structures affect the development and implementation of ITEM systems for schools. In recent years most developed countries studied have moved towards, or are moving towards, decentralized education systems. As many developing countries have at present retained more centralized systems we might question how decisions get made in such highly centralized

government structures. A research question might then be framed in relation to the degree of centralization and how this affects implementation of ITEM systems.

4 UNIVERSITY VS SCHOOL ITEM SYSTEMS

Although much ITEM research in the past has related to school education, an increasing amount of research on university (and other higher and further education) ITEM systems has now been embarked on by members of the ITEM working group. To link research in these areas, the first research question we should ask is: how do university and school ITEM systems differ? The answer to this question might seem obvious, and some aspects of it are, but the important issue is one of identifying how, or whether, ITEM research on school-based systems can be related to ITEM research on university systems. Are there any common issues relating to both types of ITEM system? Are there any common problems? If the answer to these questions is found to be 'no', then these will have to proceed as two related but independent lines of research. On the other hand if the answer is 'yes' then the challenge will be to make use of some of the school-based research in investigating university ITEM systems.

Little has been written in case study form about university ITEM systems either. A first step in researching these systems will be to ask questions like: what is the experience? Are these systems typically developed on-site by the university? How many are vendor supplied? Are vendor solutions inevitably flawed? How much do the administrative processes of an individual institution affect their ITEM needs?

Another research question that some of the group members have been recently researching is: are any of these ITEM systems designed to assist teaching and learning as well as providing administrative data? Preliminary research suggests that mainly they are designed only for administrative use, and it seems that there is a missed opportunity here to make better use of data that has been already collected. Further research is needed on this topic.

5 IMPROVEMENTS TO THE VISSCHER MODEL

The group noted that the Visscher model (1995) has been used by a number of researchers as a starting point for conceptualizing the design and implementation of ITEM systems. Members of the group, however, thought that further development of the model was needed to improve its usefulness. The model has identified correlations between factors and use, and these can

be used as starting points to investigate more detail for further developing the model. Other suggested improvements to the model include:

- Training qualities: how can the model be improved to consider the effectiveness of different strategies for training?
- What change management strategies are best suited to the education environments?
- What are the components needed to provide local support of ITEM systems?
- A number of support strategies are available: central call centre, local support, etc. Which of these is the most effective?

6 ADOPTION AND INFUSION OF ITEM SYSTEMS

Purchasing and installing an ITEM system is of little value to an educational institution if this system is not used to the full. This raises the issue of *infusion* or level of use. If an information system has become an indispensable part of an organization's operations then it is said to be highly infused into that organization. Research is needed to find out in which countries ITEM systems are highly infused into schools, and in which they are merely peripheral to daily operations.

Adoption of an ICT into any organisation implies not just its purchase and installation, but also its use. The best way to frame research on ITEM adoption appears to be by making use of innovation theory as these systems must be seen as innovations. One interesting line of research could involve seeing how different groups make use of their ITEM systems, and the factors that influenced them to choose these uses.

7 OTHER ITEM RESEARCH QUESTIONS

A number of other ITEM research questions were also identified from across a range of topics. Firstly, in relation to cross-cultural issues:

- What methods are available to tackle cross-cultural research in ITEM systems?
- How do we identify cultural vs. global factors in ITEM adoption?
- Comparison of geographically similar societies.

Comments were made on the issue of IT managers in schools, and their backgrounds – some are teachers with some time-release for doing this job while others are ICT professionals who bring quite a different outlook. One question here is: are school ICT managers going to be taken from the pool of teachers in the future? What steps should be taken by management to

provide the best support? How should we assess the performance of educational management? Along similar lines, is there a change in the nature of ICT support staff to handle ITEM systems?

Another set of question are: do ITEM systems add value and how do we measure their value and quality? Do we use measures of return on investment (ROI), efficiency and effectiveness, the school being better able to meet its aims, or resulting in better decision making? What are the uses for information at a high level of educational management? In some countries, educational managers use system information to rank teachers and to provide rewards for staff. A framework to set out these measures needs to be developed.

Regarding ITEM development, research could be undertaken to find out if development size matters and the best ways of evaluating the potential of vendor ITEM systems (particularly for university-level ITEM). Are the needs of users being sufficiently considered? Are these systems achieving all that is possible, and what is going to make them better? It was noted that in many cases, more important than money and culture is the political will to implement these systems.

8 CONCLUSIONS: THE NEXT STEP

In summary, we need to look at previous ITEM research to see how we can make use of this for planning future research. The Visscher model has been useful in the past but now needs to be adapted to meet changing requirements. Cross-cultural factors will be a fruitful area of future research as will the implementation of ITEM systems in developing countries. Seeing ITEM systems as innovations, and investigating their adoption and use using innovation theory is another important research direction.

We still, however, do not know enough about what is actually being done in relation to use of ITEM in educational institutions. What is best practice? What constitutes good use of ITEM systems? What are the flagship uses of computers in educational management at the school principal level? A combination of qualitative and quantitative research approaches is called for. We need to identify lighthouse examples of the use of computers in educational management and also example of good managers who use this technology.

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