

## FOREWORD

As we enter a new millennium, teachers' professional development is becoming widely recognised as an essential process to achieve effective uptake of new technologies in the classroom, along with the necessary equipment and technical support. However, relatively little is known of what motivates teachers to adopt the use of Information and Communications Technologies (ICT) in their teaching. This report of UK teachers' views and motivation is both timely and valuable. The evidence comes from an on-line community of professional practice, MirandaNet, and from other teachers who teach and use ICT in education.

This report comes at a time when the UK government is spending £230 million from the New Opportunities Fund on the training of teachers, with the objective that all teachers will be competent users of ICT by 2002. The parallel initiative of the National Grid for Learning aims to ensure that the whole population can access and communicate via the Internet and associated technologies.

The team brings complementary expertise to this research. Margaret Cox of King's College London has been involved with this research for thirty years, emphasising the need for prolonged training opportunities for teachers. Recently her research has confirmed that ICT motivates pupils, with an exploration of how the learners themselves perceive the value and usefulness of new technology. Margaret Cox is also chairperson of the National Association of Co-ordinators and Teachers of IT (ACITT). Christina Preston of the Institute of Education, University of London, is founder of the first professional on-line community for teachers who wish to develop ICT in education. Over the last six years MirandaNet, and its associated overseas communities, has established a new mode of collaborative professional development supported by commercial organisations and universities. This mode is most appropriate to the evolving learning society. Together with Kate Cox, an MSc graduate in psychology, they have produced this key report for the UK with its extensive investigation into teachers' attitudes towards using ICT and a framework for ICT professional development with teachers.

The findings of this UK study agree with parallel studies in the USA and Australia. The recent study in the USA led by Henry Becker and Margaret Riel<sup>i</sup> focused on a constructivist approach to education and school development with ICT, noting the need for extended professional development opportunities. McDougall and Squires' study<sup>ii</sup>, which drew on Australian experiences, also emphasised the layers of professional development in their Framework, the 'Perspective Interactions Paradigm'. In my editorial for the journal in which McDougall and Squires' framework was published, I added, with their agreement, two more foci for teachers' professional development, namely changes in the manager role and evaluation and development of the framework<sup>iii</sup>.

I commend careful reading of this report for all those involved in the UK New Opportunities Fund ICT training programmes for teachers. Indeed, all teachers and researchers supporting professional development, including their own, will find value in this report.

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<sup>i</sup> Becker, H. and Riel, M. (1999). Teacher Professionalism and the Emergence of Constructivist-Compatible Pedagogies. Annual meeting of the American Educational Research Association (AERA), Montreal.

<sup>ii</sup> McDougall, A. and Squires, D. (1997). A framework for reviewing teacher professional development programmes in Information Technology. *Journal of Information Technology for Teacher Education*, 6(2), 115-26. (Available from: [www.triangle.co.uk](http://www.triangle.co.uk)).

<sup>iii</sup> Davis, N. (1997). Framing teacher professional development. *Journal of Information Technology and Teacher Education*, 6(2), Editorial. (Available from: [www.triangle.co.uk](http://www.triangle.co.uk)).

## SUMMARY

In the third millennium the widespread use of Information and Communications Technologies (ICT) is impacting on global societies and on education systems. The UK government has responded to this trend by introducing new ICT initiatives, such as the National Grid for Learning and the Computers for Teachers initiative. The New Opportunities Fund has also implemented the ICT training for serving teachers. The aim of the NOF initiative, which began in Spring 1999 and will continue until Spring 2002, is to provide teachers with the opportunity to acquire the necessary knowledge, understanding and skills to become confident and competent in the use of ICT within their subject teaching. However, research has shown that at present many teachers do not yet use ICT in their teaching at all.

This small-scale study investigated how teachers can be helped to integrate ICT effectively into their teaching. We decided to use a sample of teachers who had overcome most barriers and were motivated to use ICT in their teaching on a regular basis to explore the factors that had led to their uptake and sustained use of ICT. In order to obtain such a sample, we sent 135 questionnaires to teachers and other educators who were members of three professional ICT in education associations, namely MirandaNet, National Association of Co-ordinators and Teachers of IT (ACITT), and TeacherNet, and their colleagues who were regular users of ICT including the Internet. These associations provide support for the practices and professional development of teachers using ICT.

Previous action research evidence from the MirandaNet members indicated a number of factors relating to their ability to use ICT in their teaching and in their professional and personal development. Ownership of a personal computer and access to the Internet were already emerging as significant in this mature group of users. Some of this group had been participating in electronic communication for more than six years. Furthermore, some MirandaNet teachers indicated that on-line access provided them with a strong sense of belonging to a 'learning community'. Their case studies concerning their use of ICT revealed more issues that seemed to matter to teachers.

We utilised this information to develop a questionnaire of 203 items to assess those factors that may have an effect on teachers' motivation to use ICT, including their personal ICT use, their attitudes towards using ICT, and the training and support that they have received. However, it is important to note that this is a study of only a small sample of teachers who are experienced ICT users, not an extensive evaluation of all the factors that may affect the use of ICT amongst the whole teaching population.

Using models and theories of attitudes and behaviour in the literature, two components of the technology acceptance model (Davis, Bagozzi and Warshaw, 1989), i.e. the teachers' perceptions concerning the usefulness of ICT and its ease of use, were examined to determine their impact on teachers' use of ICT in their teaching. Using the questionnaire responses and other previous evidence from the members of MirandaNet, the researchers set out to determine those factors that have motivated these teachers to use ICT.

Questionnaires were returned by 82 educators (60.7% of the total of 135 questionnaires that were sent). Almost two-thirds (62.2%) of the sample were males. The sample represented teachers from all the main curriculum subjects. Almost half (47.6%) were IT/ICT teachers or co-ordinators, although only one teacher had been initially trained to teach this subject. The remaining participants were mainly other class teachers or senior managers. 26% worked in

the primary sector and 68% in the secondary sector. Challenging the popular assumption that only young teachers have the time and the capacity to manage ICT in the classroom, most of these innovative teachers were senior managers and the majority were also over 40 years old.

Those motivational factors that were found to be relevant to the majority of the teachers were: having access to a computer outside of school and using many different forms of ICT for their personal use; considering ICT to be highly useful, particularly for their teaching and for their pupils; experiencing few difficulties with using ICT; and having attended useful training courses. Although most national governments see their investment in ICT in education as a catalyst for change in teaching and learning, less than half the teachers thought that the ICT courses that they had attended addressed this central issue of teaching style. This would suggest that some courses may not help teachers to adopt those new teaching methods which may be needed to accommodate ICT effectively.

Most of these competent teachers were training others, although they had been to few courses themselves, and half said they did not feel well informed about the National Grid for Learning (NGfL). On the subject of the NGfL, they agreed on the professional value of government web sites, like the Department for Education and Employment, the British Educational and Communications Technology Agency (BECTa), the Virtual Teachers' Centre and the BBC Education web sites which are subject to a government charter. The commercial sites that were visited included newspaper pages and those that relate to music, travel and sport.

Although, many of the teachers felt that they had benefited from the training they had received, they wanted to receive more training and also felt that they needed better resources and more technical support and time to use ICT. In our sample, using ICT more frequently in teaching was associated with finding it easy to think of ways to use ICT in teaching, experiencing fewer difficulties using software/hardware, being satisfied with the resources available, and feeling that using ICT made lessons easier and more interesting. Despite the fact that short special and initial awareness school-based courses were the most popular, longer award bearing courses and working conferences were found to be associated with more frequent use of ICT in teaching.

The findings of our study have many implications concerning the content of training that is necessary to help teachers integrate ICT more effectively into their teaching. It is important to note that teachers value many different forms of training and that the content of training should meet the needs of teachers in accordance with their ICT skills and experience, professional roles, and access to ICT resources. However, in general, the most valued forms of training for the experienced ICT users in our study were ideas for using ICT in the classroom, greater understanding of how ICT helps learning, advanced ICT skills, and discussion with professionals. Inexperienced ICT users may need to learn basic skills as well.

Our findings show that teachers who use ICT in their teaching on a regular basis found ICT relatively easy to use and found ICT to be useful to them, their teaching, and their pupils. Therefore, training programmes to enhance the motivation of inexperienced ICT users should attempt to address teachers' perceptions concerning ease of use and usefulness. Enhancing teachers' perceived ease of use may be achieved by improving their ICT skills, increasing their confidence, and by providing them with adequate resources, sufficient time, and technical and social support. It is even more essential that teachers' perceptions concerning the benefits of ICT are improved. In particular, training programmes should focus on the advantages for pupils' motivation, learning, and interest in lessons. Teachers should also be encouraged to view ICT as making their lessons easier, more interesting and more diverse,

and be shown how ICT can improve the presentation of their materials and broaden the content of their lessons. Furthermore, teachers may use ICT more in their lessons if they believe it will give them greater access to computers for their personal use, give them more confidence in using ICT and enhance their career prospects.

It would appear that conventional ICT courses and advisory support were not able to provide all the aspects of ICT training that teachers require. This study offers some insights into the impact of alternative lifelong learning models of ICT training for teachers. One established informal route for teachers is membership of a professional organisation, such as ACITT or MirandaNet. The members of ACITT who participated in our study reported that their organisation had given them greater awareness of the uses of ICT and had enabled them to keep up with advances in ICT. MirandaNet respondents claimed that their membership had provided them with opportunities to meet like-minded individuals in the UK and beyond, to have greater awareness of the uses of ICT, and to keep up with advances in ICT. Half of all the participants in the study said that they would be willing to spend about 15 hours a month tutoring and mentoring colleagues on line, which suggests that these on-line lifelong learning communities have a practical future. Furthermore, some elements of the MirandaNet model, such as long-term mentoring, publishing case studies for peers, industry partnerships in product and service development and professional exchange with teachers world-wide, may be useful to other professional groups who want to set up similar on-line communities.

Overall the findings of this study have contributed to the framework for the professional development of teachers, which is presented at the end of the report. It is a dynamic framework, which is in the process of development, and it will be updated in accordance with new research, educational theories, and responses from teachers and teacher educators. Furthermore, there will be an experimental expert mentoring service organised by MirandaNet Fellows for teachers who want to ask questions about existing practice and explore the potential for similar ICT projects in their own institution ([www.mirandanet.ac.uk](http://www.mirandanet.ac.uk)). The framework has been published on the Internet ([www.compaq.co.uk/education](http://www.compaq.co.uk/education)) and is therefore available to schools, LEAs, professional associations, and other workers in the field of education.