

Teacher Professional Development and ICT: An investigation of teachers studying a Postgraduate award in ICT in Education

Introduction

The Schools IT2000 initiative, launched in 1997, was the first large-scale attempt to integrate ICT into teaching and learning in the Irish education system. Prior to its launch computer use in Irish schools was inhibited by the absence of a clearly defined policy. During the 1990s, in the absence of a national policy, schools began to develop IT skills type courses resulting in the dominance of the acquisition of basic IT skills at post-primary level ref? The sporadic use of ICT in post-primary schools was reflected in a number of studies conducted in the nineties, which found considerable differences in the level of exposure students received to ICT. These studies also found little use of ICT in teaching and learning (McKenna et al, 1993; Drury, 1995; Mulkeen, 1997). In response to the low levels of use across the curriculum a central aim of the Schools IT2000 initiative was to provide in-service to all teachers to enable them to develop the necessary skills to integrate ICT in teaching and learning. In order to achieve this aim a training continuum was developed with the objective of enabling teachers to progress from novice to expert users of information technology in education. Short-term in-service courses were initially offered to all post-primary teachers in the state. These courses introduced basic IT skills and to date have trained 59% of post-primary teachers in the basic use of ICT (NPADC, 2001). In order to extend the level and type of training available third-level institutions were invited to develop professional development programmes in the area of ICT in education. Date? This paper reports on the findings of a survey of teachers who had progressed along this training continuum and had opted to study for a postgraduate award in ICT in

Education. The survey aimed to determine the general profile of teachers electing to study on the programme, their current use of ICT and the types of in-service in ICT they had previously been exposed to. While the survey was distributed shortly after the students had completed the course it also attempted to establish whether computer use by the participants had changed since commencement of the programme.

This paper firstly places the research in context by examining the use of computers in Irish post-primary schools to date, following this review the provision of in-service in Ireland will be briefly examined before looking more specifically at IT in-service.

ICT in Post-primary Schools: the Irish context

According to Buettner (1997) the use of computers in education in several countries has followed a distinct pattern from a focus on programming and computer technology (The Techno ghetto stage) to a focus on skills acquisition in informatics type classes (the keyboarding stage). The most recent focus has shifted towards an emphasis on the integration of ICT in teaching and learning. (still Buettner?) This recent shift is reflected in several national initiatives including; the National programme for IT in schools: Sweden date?, Information Society 2000: Denmark date, The networked nation: Australia date?, Schoolnet: Canada, date? KII: Korea.date? The use of the computer in Irish post-primary schools has followed a similar pattern. However use was not on a similar scale to that of other countries.?? The 'techno-ghetto' stage of computer use was clearly evident throughout the late seventies and eighties in Irish education(Post Primary?) where there was continued calls for the introduction of a computer-based subject (Kelly 1984a, 1984b). These calls were a response to international trends in this area and while no state-wide subject was established, small regional pilot subjects and projects were developed

with a strong emphasis on programming (Brady, 1987). Any eggs? Towards the late eighties changes in several curricula in Ireland resulted in a shift in focus towards informatics type use. This resulted in a dominance of computer use in informatics type classes, which remained throughout the nineties (Mc Kenna et al, 1993; Drury, 1995; Mulkeen, 1997). Computer use in post-primary schools tended to be largely applications based with the majority of use within business studies and technical graphics where students studied the vocational uses of the technology (McGarr, 2001; Drury, 1995; Mulkeen, 1997).

The launch of the Schools IT2000 initiative in 1997 signalled the start of the 'integration stage' of computer use. In order to achieve integration the Schools IT2000 initiative aimed to equip schools with IT resources, provide a training continuum to allow teachers progress from novice to expert users of the technology and provide an infrastructure to support schools and teachers in their attempts to integrate ICT in teaching and learning. As part of the training continuum the Department of Education and Science developed short skills type courses which were offered to all teachers. (was it not the NCTE who developed these courses?) These short-term introductory courses were delivered in two successive phases and aimed to provide basic exposure to ICT. Phase I was an introductory course aimed at introducing computers, it focused exclusively on the use of the web, email and word processing. Phase II was an advanced? More advanced? course and introduced several generic software applications including desktop publishing, spreadsheets and databases. In order to extend the level of training offered to teachers the Department of Education and Science invited third-level institutions throughout the state to develop professional development programmes at higher diploma and degree level to teachers wishing to extend their skills and expertise in this area. Date? The

development of such courses aimed to complete the training continuum available for teachers wishing to integrate ICT in teaching and learning.

Teacher In-service in Ireland –post primary? (in-service or teacher professional development?)

The announcement of the NCTE? training continuum, which enabled progression, was a change from short-term stand-alone courses, which were the primary method used to deliver provide? in-service. In-service in Ireland, up to that point, had been described by several commentators as sporadic and reactive rather than structured and proactive (Sugrue and Ui Thuama 1997; Leonard, 1996; Gleeson and Leonard 1999; Hyland and Hannafin, 1996; Duffy and Dugdale, 1993). Several different types of in-service provision, have been provided to date in the Irish system., These include cascade models, extended courses, postgraduate courses and whole school planning approaches, with ‘short courses’ tending to dominate provision (Hyland and Hannifan, 1996). (Long sentence –could possibly be broken into two sentences as above?) According to Leonard (1996) these courses have generally a specific aim of providing information to participants in a top-down manner aimed at implementing central decisions. While this type of course is clearly the dominant model of delivery Hyland and Hannafin (1996) note that “*dissatisfaction appears to be particularly high in relation to short courses and information type sessions*”(p.165) and also highlight the lack of the publication of the evaluation of these type of courses.

While the short course model continues to dominate in-service provision Sugrue and Ui Thuama (1997) also note that the delivery of these courses take place in the absence of an overall strategy;

It is commonly believed that spending occurs on an ad hoc basis and priorities frequently alter as a consequence of ministerial directive or in response to pressure groups to have issues ... addressed urgently. (p. 58)

Despite these criticisms Gleeson and Leonard (1999) identify a recent shift in the provision of in-service. In their review of developments in in-service provision since the 1970s they distinguish four phases of teacher professional development. While recognising that short-term reactive courses dominate the initial and intermediate phases, where in-service reacted to system demands particularly through department provided subject orientated courses, they highlight a recent shift towards support teams working with teachers. The further move towards whole school evaluation since the late nineteen nineties signifies a move to what the authors describe as a “pre-professional phase” suggesting a shift in the perceived significance and value of school-based in-service. (unclear which is phase one, phase two, etc) They conclude that several tensions or discontinuities exist including tensions between meeting immediate system needs and the promotion of teacher professionalism. This mirrors Sugrue and Ui Thuama (1997) who conclude that the absence of policy and structures for its? development on an ongoing basis “*present provision is characterised by a cult of the immediate, and is focused on the practical and the utilitarian*”(p. 67).

ICT in-service and the problems of transfer

Although the IT in-service framework envisaged as part of the Schools IT2000 initiative marks a shift from the ‘one shot’ type courses to a structured and more progressive model, the content of the courses provided did not provide teachers with the necessary knowledge and skills to enable teachers to integrate ICT in teaching and learning. Ref. These courses were primarily introduction type courses with an

emphasis on industry standard applications software with little or no reference to their uses in teaching and learning contexts. Despite the predominant use of short skills type courses McDougall and Squires (1997) argue that these type course have little impact on classroom use. In their investigation into the five foci of in-service courses they highlight the effectiveness of courses which focus on pedagogical aspects and the theoretical underpinnings of what occurs in classrooms and other learning environments rather than skills-based courses which focus solely on the technology. A further problem regarding short-term technology focused courses according to Owen (1992) is that they tend to attract teachers with a pre-existing commitment to computers rather than novice teachers, a trend also identified in the recent evaluation of the Schools IT2000 initiative (NPADC, 2001).

These skills-based courses, according to Baron et. al. (1997) assume that “*subject expertise leads to teaching expertise without pedagogical preparation*”(p.162). They further argue that examples of good practice, possibly identified through research, cannot be easily transferred to other classrooms. This view is supported by Kennewell (1997) who highlights that research into classroom use of ICT and its benefits is usually conducted by highly competent or willing teachers. Therefore attempts to generalise possible strategies through demonstration in a ‘one size fits all approach’ is ineffective. Skills-based courses also ignore contextual factors within the working environment of the teacher which ultimately decides whether teachers will consider integrating it or not (Cox, 1997).

Short-term courses also do not provide sufficient support for teachers in their attempts to integrate ICT within teaching and learning. Several studies have highlighted the problems associated with first time integration of IT by teachers (Mevarech, 1997; Sandholtz et al, 1997). These studies show that the process of achieving successful

integration is not immediate and that initial attempts can be very challenging for teachers. In this 'survival stage' (Sandholtz et al, 1997) the changing classroom environment created by the introduction of the technology can be very challenging and may cause the teacher to reject the technology and return to teaching without it. A study by Mevarech (1997) in particular highlights a the? non-linear process involved revealing a “negative slide of decline in performance and attitudes followed by a positive side of overcoming the difficulty or restructuring teacher pedagogical content knowledge”(p. 46). Within the stages of adoption outlined by Mevarech, pedagogical issues are as important as technical issues and not all teachers survive this initial stage. This suggests that the IT skills-based training received did not prepare teachers for the pedagogical difficulties associated with integration. This is supported by findings from an international survey of computer use by Pelgrum and Plomp (1993) who identified three categories of computer using teachers; low medium and high integrators. They found that having had training does not distinguish the sub-groups of computers users, they found however that the content of such courses does.

In their investigation into the types of outcomes of in-service Harland and Kinder (1997) identify a hierarchy of outcomes ranging from basic “material and provisionary” outcomes (where teachers receive information regarding curricular changes or initiatives) to outcomes which impact on classroom practice. Short-term in-service courses tend to have little impact on practice and are primarily employed to distribute new information to participants. Proponents of ICT skills-based courses place little emphasis on the educational underpinning of the use of the computer as it is assumed that ICT has a constructivist orientation which can have a catalytic affect

on teaching. ?????????? Who says? However as Kennewell (1997) highlights “there is no reason to believe that the mere usage of computers will result in improvements in learning”(p.170).

Defining effective use

The lack of a pedagogical focus to much of the ICT in-service delivered reflects the lack of a common understanding of the specific ways the technology can enhance teaching and learning. This is further heightened by the constantly changing face of the technology itself. Without a clear understanding of the educational benefits and potential of the technology the term ‘integration’ will continue to be interpreted in its widest sense. This often causes computers to be used in a superficial manner, as outlined by Marshall (1997);

Our failure to consider what we want students to learn from working with technology often leads us to accept activity for the sake of activity (Marshall, 1997, p. 37)

Without a clear definition of what should be achieved from integration, it is probable that skills-based courses will continue to be delivered. The continued acceptance of skills courses, despite their drawbacks, is also due to the fact that they reflect the type of use within Post Primary? schools at present. These courses may therefore support current use of ICT in isolated skills courses rather than challenge it.

This literature review has described the background to computer use and teacher in-service in Ireland highlighting the dominance of skills acquisition courses and a dominance of short-term courses delivered in the absence of an overall policy. It also

examined the different types of IT in-service available and the problems associated with the transfer of acquired knowledge into classroom use. In this context, and in light of the limitations of short-term in-service courses, the impact of alternative models of in-service, including longer-term programmes such as postgraduate programmes leading to higher awards should be examined. The following section outlines the methodology used in the study.

Methodology

Background to the study

As part of the training continuum outlined in the Schools IT2000 initiative third-level institutions were invited to develop postgraduate programmes to enable teachers to extend their expertise and professional competence in the area of ICT in education. Date? It was envisaged that the short-term in-service courses in the area of ICT would provide a foundation for teachers allowing them to progress to these professional development programmes.

In response to the invitation by the Department of Education and Science the [-----
-----] developed a Graduate Diploma/Masters course in ICT in Education. This course was specifically targeted towards practicing Post Primary? teachers and was designed to ensure a smooth progression from initial in-service which teachers would have been exposed to up to that point. Accreditation of prior IT skills obtained in Phase 1 and Phase 2 courses was an inherent feature of the programme.

The postgraduate course was broad in its scope and vastly different than the computer technology focused programmes in existence up to that point. The course had two parallel foci:

1. The course aimed to introduce students to different types of information and communication technologies (this included exposure to different types of software, technologies such as video conferencing and other web-based technologies, programming and knowledge of computer networks).
2. The programme also focused on the theoretical underpinnings of the use of the technology, focusing on the possible uses and impact of ICT on classroom pedagogy, the role of the teacher and its impact on the school as an organisation.

The course was delivered nationwide through the establishment of outreach centres in several regions. Students attended outreach centres on a weekly basis for workshops and tutorials relating to different aspects of the course. Workshop sessions were a combination of hands-on computer exposure experience? and group discussions relating to the theoretical elements of the programme. This balance aimed to ensure that students could examine critically the educational benefits of the technology which they were exposed to and allowed them to discuss possible uses and potentials in an educational context. Central administration of the course was achieved through the use of Learning Management Software (LMS) software which also aided in the delivery of coursework.?

Purpose of the Study

Since the content and nature of the course was vastly different to courses delivered up to that point this study aimed to examine the profile of teachers opting to progress onto the programme, their reasons for opting to study on the programme and the impact of the course on the participants on their teaching?.

In addition, as this course attracted teachers wishing to extend their knowledge of ICT in Education, this study also aimed to examine;

- The participants' prior use of ICT in schools.
- The participants' type of use of ICT since commencement of the course.
- Their reasons for enrolment on the programme.
- The effectiveness of the training continuum developed as part of the Schools IT2000 initiative.
- The participants' attitudes towards the type in-service that they had been previously been exposed to.
- The participants' perceived benefits and relevance of the course.

(Some repetition between this list and the paragraph above)

Research approach

The research approach involved the distribution of a questionnaire to all course participants that had recently completed the programme. Date? What year? The M.Ed programme? The questionnaire was distributed online via the LMS software used as

part of the delivery of the programme. All students were invited to participate in the study.

Although the questionnaire comprised of both open and closed type questions it was predominantly qualitative in nature with several open-ended questions allowing respondents to elaborate on issues.

The questionnaire aimed to establish;

- Profile of the teachers: Including gender, age, number of years teaching, subjects taught and responsibilities within their schools.
- Type of schools: Including the size of school and the level of IT resources in the school (total number of computers and number of computer cluster rooms).
- The length of time they have used computers in their school, the type of use of computers in their school prior to commencement of the programme.
- The teachers current use of computers in the school, what they would like to use the computers for and the barriers affecting use.
- their reasons for choosing the programme
- The impact of the course on their use of the technology within their respective schools, the benefits of the course

The questionnaire was distributed to 83 students who were studying at various stages of the programme for the award of graduate Diploma or Masters. While 63 responses

were obtained giving a 76% response rate, only fifty-six (56) of these responses were considered valid as responses from participants teaching in the primary level sector and in colleges of further education were omitted from the analysis as the research aimed to specifically focus on teachers from the post-primary sector. It was felt that the nature of the post-primary sector was considerably different from the other sectors.

The questionnaires were analysed using SPSS to identify possible trends and patterns however the primary analysis carried out was qualitative in nature due to the number of open-ended questions incorporated in the questionnaire.

Findings

Profile of participants

The questionnaire responses obtained revealed an almost equal divide of males and females studying on the programme and while the research found a range of ages the highest proportion of students tended to be experienced teachers (36-50 years of age).How long teaching? An analysis of the enrolment statistics for the programme revealed the responses were a representative sample of the cohort in general.??

Explain

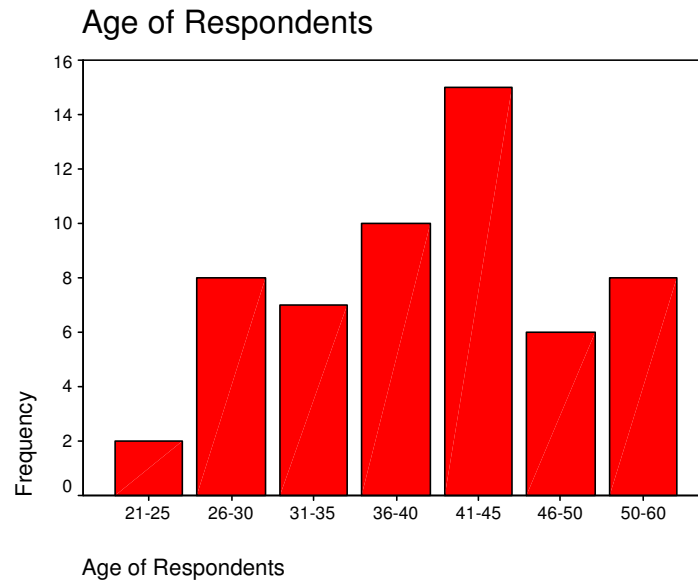


Figure I. Age of Respondents

The teachers taught a wide range of subjects at both Junior (12 – 16 yrs) and Leaving Certificate (16 – 18yrs) level. However high proportions what %?of the group taught Technological subjects, Science and Maths. Twenty-one percent of teachers surveyed categorised themselves as computer teachers although it is not a formally recognised subject at post-primary level. The respondents were from a range of schools. However a proportionately higher number of teachers surveyed were from vocational schools. what %? The findings suggest that the teachers tended to be from well resourced schools with a high proportion of schools having two or more computer labs.

A clear divide between young and older teachers was evident from the findings as all had computer responsibilities yet only the more senior teachers' responsibilities were officially recognised in the schools. How were they 'officially recognised? Over half (59%) of teachers had unofficial computer responsibilities. Computer responsibilities

were wide ranging and dealt with almost any aspect of computer provision within their schools. The following responses highlight the diversity of these duties;

I teach computers and therefore am left in charge of the computer room. Upgrading, buying new equipment, deciding the course/exam/syllabus in computers is my responsibility. I look after whatever computer maintenance that I can, but for upgrading the network, Internet connection problems and registry problems that we had, we got outside help.

I am the head of the IT department because no one else wanted to teach computers. I have to make sure that the hardware is functioning properly...that means that I have to call in our maintenance man whenever a problem occurs. I also had to try and raise finance for new equipment and funding for ECDL ... it's largely up to me to promote IT within the school. No one else is too interested in the subject.

There are two computer teachers ... we have full responsibility for the maintenance and up-keep of the equipment. We were also responsible for networking the room - from sourcing the hardware to the actual networking itself.

I am the only person who uses, teaches, orders, and maintains the computer room.

General maintenance of machines, linking up new equipment, e.g. projectors, printers, links to Internet, upgrading and installing certain software and suggestion of selection of certain extras equipment and software that may be required.

The nature of these computer duties suggests that this is a very experienced group of IT teachers. However these tended to be males as there was a significant difference between males and females in relation to posts of responsibility. Again what %?

Three quarters of the teachers taught computers highlighting the high levels of ICT skills among the group. The highest proportion % of these taught computers for over five years. What do you mean by 'taught computers'? This statistic is particularly important as it highlights that the group have obtained their IT skills and knowledge prior to the Schools IT2000 initiative. This suggests that few have benefited from the recent in-service framework established under the Schools IT2000 teaching skills initiative as they had already obtained the skills it aimed to address. Are you sure –it is now eight years since the first NCTE courses? Did you ask them this?

Fig. II No. of years teaching computers

Although there was no significant difference between the number of males and females teaching computers, fewer teachers from humanities subjects tended to categorise themselves as computer teachers. what %?

The majority of these computer classes were computer applications courses where word processing, spreadsheets, desktop publishing and databases were taught. The European Computer Driving Licence (ECDL) was also frequently mentioned. Although the applications courses were clearly the dominant type of computer use, the variance in content of these computer courses is quite significant with some focusing on programming, some on applications software while others focus on the use of the internet and related technologies as seen from the examples below;

Basic Office Applications to First, Second and Third Year Students. ECDL to Transition Year students. Web Page design with Transition Year.

1st years word, 2nd and 3rd years spreadsheets, 4th years word, internet, access, web design, ECDL 5th and 6th year word spreadsheets power point internet access career investigation

Introduction to IT and keyboarding skills to 1st years. ECDL to Transition Years. Word-processing, spreadsheets, database and HTML to 5th Years

Again if you have figures on the applications taught, this would be a useful table to include.

This variance reflects the 'ad hoc' delivery of skills acquisition type classes in schools and highlights the effect of the absence of a formal IT policy or an ICT curriculum? in education since the introduction of computers in schools.

All teachers had previously attended IT in-service. A high percentage had attended short-term courses such as the IT2000 phase 1 and 2, the Intel teach to the future course and other subject specific in-service. Some had also completed the ECDL. Almost 30% of the respondents had obtained an additional qualification in this area with 9% of respondents having completed Graduate Diploma courses in computing as

far back as the mid eighties. This experience was not un-expected as credits on the programme up to a maximum of one third of the total credits were given to suitable applicants –convoluted sentence.

Do you have the actual figures of what courses participants completed? Can you present this info on a diagram?

You said on page 15 that the participants had gained their skills prior to IT2000 so why did they do these courses? If so skilled why were they not NCTE tutors?

Use of computers in Schools

When asked what they had used computers for before the Graduate Diploma six categories were identified from participant responses. 44% of respondents primarily used it for the teaching *of* computers and a further 12% used it as it was a requirement in their particular subject areas such as the use of Computer Aided Drawing (CAD) in Junior Certificate Technical Graphics and the use of spreadsheets and database programmes in Junior Certificate Business Studies. 18% of respondents referred to the use of the computer as a presentation tool and a further 18% used it in the preparation of lessons and tests. 21% used it in project work and student competitions while only 7% referred to the use of ICT in the classroom in an educational context. Include table.

Further analysis revealed that a higher percentage of teachers had begun to use the computer for presentation purposes since commencement of the programme (mentioned in 32% of the responses). This is reflected in several responses;

PowerPoint has been used in the teaching of History and Computing. This use will increase in the future.

I use the data projector to display the different aspects I am teaching

Outside of computer classes very little due to the fact I don't have a data projector

Reference to the use of ICT in Teaching and Learning also increased since the commencement of the programme (from 7% to 21%). This again was evident from some of the responses below;

Now I try to bring certain non-computer classes (e.g. Economics) to the computer room to integrate ICT into the subject. I have been very much taken with the Web Quest concept which I learned about while on the Grad Dip course and am devising ways of getting my students to interrogate the computer to find elusive facts or statistics.

I use the Internet much more with my students now than I did before the course. In fact as a result of the course I got our school connected to the Internet. This has opened up a whole new educational world to the students. With my Business students I use web sites such as LeavingCert.net and Scoilnet to enhance their knowledge.

I didn't use it before beginning the Graduate Diploma ... I used a web site which I designed myself to teach Buddhism, a module in Religion. I have used software in teaching maths (co-ordinate geometry of the line and circle. I have used some web sites for teaching maths but found that software was more relevant to course.

Barriers to use

Despite the level of computer experience among the respondents the teachers identified several barriers affecting their use of ICT. The most commonly mentioned barrier to use was access to the technology (55%) followed by inadequate hardware (39%) and poor technical support (13%). This was continuously raised;

The physical infrastructure - classrooms are not wired for the internet - but I try to make the most of what facilities are available. I remember very well when what I have available was considered to be "state of the art", and that isn't so long ago.

The access to the computer room, the time that is wasted on repairing hiccups in the systems-resulting in the lack of confidence with actually having a computer inter active environment.

Timetabling. IT Room seems off limits for anybody not teaching computers per se. Limited access to any other computer while in School.

Access to the computer room, it is timetabled mostly for secretarial classes and computer classes

The lack of data projectors and computers in the teachers own classrooms were frequently mentioned as possible solutions to the problems of access. However continued investment in resources may be addressing this issue within schools (NPADC, 2001). Time to explore possible uses and the lack of relevant educational software were also mentioned frequently (20% and 13% respectively). As expected training was the least mentioned barrier among this group (5%). No significant difference between IT-coordinators and non-IT coordinators were found.

Table

Initial attraction to the course

An analysis of responses to this question found that participants were attracted to the course for three main reasons. Almost half of the respondents (48%) referred to the importance of obtaining a recognised qualification in this area.

The possibility of having the skills which I have acquired over the years academically recognised in a formal way.

I had quite a lot of experience and interest in IT and I wanted a qualification that would consolidate this.

I felt it was important to achieve a recognised qualification in IT which would enhance my existing knowledge of computers.

I have taught computer studies for many years and would like a formal qualification

An interest in ICT and a desire to obtain some formal qualification in the subject area.

There were several reasons given for the need to obtain a formal qualification in this area. Some respondents referred to the promotional prospects associated with a higher degree;

Interest in computers and to improve promotional prospects within the school

I felt it would improve my job opportunities and improve my salary.

Both comments are particularly revealing as there are financial incentives for teachers to complete Masters degrees in the Irish education system. Additional qualifications also improve teachers promotional prospects within their respective schools.

A further 33% referred to their personal interest in computers and a desire to learn more about the topic. 18% of respondents referred to the interest in exploring the potential of ICT in teaching and learning.

Should this be a separate section?

When asked to reflect on what they had achieved from the course a very high proportion (64%) mentioned the acquisition of new skills. They ranged from new knowledge of networking, website design to the ability to programme.

While only 21% of teachers made reference to the new 'awareness' in the area which they had obtained from studying the course. Confusing sentence. Responses below highlight this;

It has given me a greater awareness about the potential of ICT both as a vocational and pedagogic tool.

It has helped me to see possibilities for other subject teachers and encourage them and assist them in their use of IT.

It has broadened my horizons in relation to the potential of IT as a teaching and learning tool.

I am definitely applying more constructivist teaching practices since beginning this course

A surprisingly large number (14%) felt that the course had had no impact on them.

This may reflect a particular cohort of the group, which had opted to study the course purely for the purposes of recognition or status and may have a predetermined view of the uses and limitations of this technology within schools.

table

Did you ask directly if the course had any impact on their teaching? If so you need to discuss it, particularly as you refer to this impact (or lack of impact) in your discussion and conclusion.

Discussion of research findings

A central aim of this study was to identify the general profile of participants opting to study on the programme. In particular the research aimed to determine whether the training continuum developed as part of the Schools IT2000 initiative had attracted non-computer using teachers and whether these teachers availed of the continuum of progression developed. The profile of teachers opting to study for a higher award in this area however suggests that this group were highly competent computer users prior to enrolment on the course. There is little evidence to suggest that any significant number of teachers surveyed have benefited from the continuum of progression developed as part of the Schools IT2000 training initiative.

In addition to having good IT skills, these teachers tend to also be very experienced computer teachers. The desire to obtain a qualification in this area suggests that many of these teachers feel that a formal qualification may 'rubber stamp' their current roles as IT teachers/coordinators within their schools. This is particularly so in the Irish context since no formal computing subject exists at post-primary level. Since no formal computer subject exists many may have entered the school as teachers of existing subjects and assumed the role of IT teacher through personal interest in the technology. The high percentage of teachers from technical, Science and Maths subjects supports this thesis why? and is also supported by the findings of the NPADC evaluation of Schools IT2000 which found;

A difference was observed with regard to the attitude towards the use of ICT among teachers in post-primary schools. Those involved in teaching

Engineering and other Technology subjects felt that ICT was inherently more useful than did those teaching Arts and Humanities. It is necessary to examine why Arts and Humanities teachers find ICT less useful, and ways should be explored of making teachers aware of relevant software for each of the range of subjects. (NPADC, 2001, p.7)

The high percentage of teachers categorising themselves as computer teachers highlights the continued dominance of skills acquisition courses. These courses constitute the majority of computer use at post-primary level. The priority assigned to such use is a result of 'bottom-up' initiated change within schools since the early nineties (McGarr and O'Brien, 2000). It is evident that despite the recent emphasis on integrating ICT in teaching and learning the teaching *of* computers still tends to be the most frequently mentioned uses of the technology. It is therefore difficult to predict the impact of the current initiative to integrate ICTs across the curriculum. The findings suggest that these 'computer teachers' may in fact concrete this current use of ICT rather than challenge it. Why? Further research is needed to examine this issue, particularly since these teachers will be pivotal in future attempts to integrate ICT in teaching and learning within their schools.

In addition to teaching computer-based subjects, participants have many other computer responsibilities, including the repair and maintenance of the equipment and the purchasing and updating of IT resources in their schools. The findings of the survey suggest that many participants prioritised the practical skills gained from the course, such as network management skills, web design and practical computer knowledge, as they directly benefited their current responsibilities within Schools. The varied computer responsibilities by participants also points to the need for greater technical and curriculum support within schools.

Use in Schools

The reported use of computers in schools by the course participants suggests that the Schools IT2000 initiative has had little impact to date. This is not surprising as the initiative was in its early stages at the time of the survey. Date? First NCTE courses were summer 1998. However there is evidence from the survey responses that course participants were attempting to integrate ICTs in their classrooms. While this is encouraging, several barriers were identified by the participants. As the findings have revealed, the predominant types of barriers identified included the need for more up to date and additional hardware and problems associated with access to the computer facilities. The use of the IT resources by computer type classes was mentioned regularly as the reason for low levels of access. The question must therefore be raised as to whether schools can deliver IT on two very different levels, one on the delivery and development of essential IT skills and second on the integration and enhancement of teaching and learning through the integration of ICT. While it is clear that schools are not adequately resourced to deliver on these two distinct levels, the recent (5 years ago?) evaluation of the Schools IT2000 initiative announced that;

It can be concluded that the Schools IT 2000 initiative has been successful in increasing the number of computers in Irish schools, and in significantly increasing access to the Internet for teachers and pupils. Ireland is now on a par with or better than the EU average for each of these key measures. (NPADC, 2001, p1)

The issue of access to resources was also found to be a barrier to use in several studies (Zammit,1992; Sandholtz, 1997; Andrews, 1997; Ertmer, 1999);

At present introductory computer and keyboard classes at junior levels clog up the computer room timetable making it difficult for computers to be used across the curriculum. (Zammit, 1992. p.65)

The reliance of computer labs must be revisited if teachers are to be allowed to experiment with the potential of IT in their own classrooms. An alternative distribution of IT resources must be considered within schools which attempts to open access to a larger group of teachers and students (Gleeson et al, 2001). This may be achieved through the use of portable laptops or the distribution of a number of computers in several classrooms. Yet the financial implications of such a move may prevent schools from considering these alternative options. A revision of existing curricula is also required to promote greater use in subjects as the dominance of state examinations at post-primary level determine what is taught in existing subjects.

Subject cultures

The findings of this study seem to suggest that the dominance of subject cultures, state examinations and computer applications type courses in schools seem to dictate provision and while the Schools IT2000 has attempted to integrate ICT in teaching and learning it has not addressed any of the school-based factors which ultimately decide the success or failure of integration attempts. It would appear that within the existing conditions the use of the computer will remain a peripheral activity in post-primary schools and will remain a tool to be studied. The recent investigation by the NCCA into the feasibility of introducing a computer based subject at Leaving Certificate level is evidence of this vision (O'Doherty et al., 2004). Within this context it appears, particularly with the initial cohorts of students opting for this programme, that the teachers may not act as change agents in their respective schools and may instead continue their existing roles as 'computer teachers'.

Conclusions

This research has investigated the profile of teachers opting to study on a Graduate Diploma/Masters course in ICT in education. It has found that the teachers opting to study this programme are already long established computer teachers in schools. They bring with them predetermined notions of the use of ICT in education which may be in direct contrast to the aims of the course. The findings of the survey suggest that although the course has had an impact on their use of ICT in general their use remains similar to their use prior to commencement of the course.

The findings point to the need for further research in this area which should examine the long-term impact of the programme on the teachers use and also the need to survey more recent cohorts of students studying on the programme to examine whether a similar profile of teachers continue to study on the programme.

This research has also found that despite the emphasis of the course, which focused on the benefits of integration ICT within existing subjects, cultural and systemic factors within the post-primary system continue to curb integration. It would appear therefore that despite the continued drive to integrate ICT, its initial impact may be minimal. Real change will tend to be evolutionary rather than immediate since long held beliefs and traditions hinder change. What impact can such courses have on teachers' practice if they cannot influence the institutional factors, which ultimately determine the nature of ICT use in schools? Further research is required with similar cohorts of students, which examines the long-term impact of such courses and particularly examines whether the participants act as change agents or continue with current use.

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