A case-study paradigm for ICT researchers wishing to investige how teachers' attitudes and practices might change over time in an ICT environment

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Abstract

The aim of this paper is to provide a qualitative research paradigm for researchers wishing to undertake similar ICT-related case study research in the area of how/if teachers' attitudes and practices change over time in an ICT classroom environment. The paper describes in detail a funding-approved research project to be undertaken at Intercollege (College University) Nicosia. It is argued in this paper that more case-study research in this field of study might firstly, help to embrace 'qualitatively' key issues in ICT, and secondly, enable a researcher-writer to work within a constructivist paradigm. Moreover, the author of this paper holds that a lot of attitudes related ICT research only provides one-off detailed positivist 'questionnaire-snapshots' of attitude as opposed to a more qualitative case study approach. It is suggested that generalisability is a function of sampling and that over time a 'gallery' of research samples might be used to make meaningful generalisations. It is hoped that a 'gallery' database might provide explanations as to how the use of technology is impacting on teaching and learning (as in Cunnington's *et al*. 2002); researchers who undertake research in this area, are encouraged to share their findings on Intercollege's new language-laboratory web-page gallery-research site (for more information please email Chris Alexander on alexander.c@intercollege.ac.cy).

1. Topic of study

The broad area of this study appertains to how the 'new' digital culture has caused significant changes to the 'traditional' student-teacher learning environment and relationship. The rapid growth of features and functions offered by the convergence of various multi-media language applications gives teachers and students new capabilities. Some of these capabilities comprise the ability: (1) of each student to speak simultaneously and yet be audibly isolated from one another; (2) to communicate with any number of students via headsets or computer terminals from the teacher's 'controlling' networked mother terminal; (3) to place students in any combination of pairs/groups; (4) for each student to watch a 'customised' TV/satellite broadcast or to listen to a radio broadcast; (5) to send text messages within a student group or to students abroad; (6) to analyse a text (student or other) with the whole class or any number of students; (7) to make use of educational CD ROMS in a networked system i.e. each student can work on do different things; (8) to access digitally stored programs, exercises, tests, video archives etc; (9) to take advantage of the huge amount of data the World

Wide Web has to offer; (10) to monitor a student with or without him or her knowing; (11) video conferencing.

2 Context of this study.

Intercollege (Nicosia), along with many educational institutions around the world[1], is aiming to improve its teaching and learning practices with the innovative use of ICT[2]. In 2003 it approved a budget for the development of a modern language resource centre at its Nicosia campus. The co-ordinator's (this writer) main duties and responsibilities comprise: (1) the development of the centre's capabilities; (2) encouraging college lecturers to use the centre; (3) in-service training of staff to use the centre; (4) assisting (supporting) staff, if necessary, while they use the centre i.e. the presence of the co-ordinator during some classes might be expected; (5) responding to the real needs of Intercollege staff by developing or purchasing suitable pedagogic materials. It was acknowledged by the Head of Department that there might be some teacher resistance or anxiety related to the 'getting-used-to' or 'acceptance' phases of the 'new' technology. In particular, positive attitudes to the implementation of an ICT innovation may not necessarily lead to 'positive' changes in teaching practice, and 'positive' changes in teaching practice may not denote positive attitudes towards; this point is also echoed in Peacock (2001)[3]. Among some of the reasons why a positive attitude towards technology does not ensure that teachers will be able to use it in the classroom are: (1) lack of support or recognition for integrating computers (Grau 1996, Strudler *et al* 1999); (2) inadequate training and technical support (Abdal-Haqq 1995, Lam 2000, Langone *et al* 1998, Levy 1997, Smerdon *et al* 2000); (3) other factors that may influence technology use are age, gender, attitudes towards technology, teaching experience, general resistance to innovation, but the results are mixed as to the extent these variables are related to teacher use of technology (Lam 2000 cited in Egbert *et al*. 2002, 108-126). A longitudinal case study that described and interpreted how or whether teachers' attitudes changed in an ICT environment may be relevant to the co-ordinator, as it would be 'strong-in-reality'[4], 'illuminative'[5] and particularistic[6].

3 Aims and research questions

The broad aim of the research[7] would be to analyse participant and practitioner experiences during the implementation–of-innovation phase. It is thought that this may help the co-ordinator ascertain how ICT is fundamentally shaping the nature of the

[1] On http://wings.buffalo.edu/world-languages/lab/labs.htm online access to 100's of top American, British and Australian language resource centres is available.

[2] ICT -- information and communications technologies

[3] Peacock (2001 cited in Borg 2003, 90) maintains, based on a longitudinal study into the changes in the beliefs about L2 learning, that behavioural change does not imply cognitive change and the latter does not guarantee changes in behavioural either.

[4] Adelman et al. (1980, 59-60) hold that case study data is 'strong in reality'

[5] Parlett and Hamilton (1977: 10) state that an illuminative case study aims to discover and document what it is like to be participating in a scheme. Also it discerns and discusses an innovation's most significant features.

[6] Stake (1995, 7-8) maintains that the real business of case studies is 'particularisation' He suggests (ibid) the term 'petite generalisations' for general statements made within the study

[7] The research would be guided by current issues in the literature of this field.

teaching and learning processes; such findings may also have the potential to be extremely valuable with regard to the implementation and development of a better language resource centre. In light of the literature review issues[8] discussed in section 4**,** and the writer's professional context as ICT co-ordinator (discussed in section 2), the writer's research question will be to describe and tentatively interpret[9], how/whether teachers' attitudes and practices changed over time in an ICT environment[10]. Research findings might provide relevant information for the writer to act on 'real-time' as a co-ordinator and also for eventual dissemination to a wider ICT audience. Student feedback regarding ICT-usage, in the writer's opinion, also has value in this study. Firstly, feedback is useful for the ICT co-ordinator as he can determine the suitability of materials for particular student groups. Secondly, this feedback can be channelled to the teacher and assessed (by the researcher) for opinion mismatch; this might aid the teacher adapt materials to student needs and also provide new 'leads' for questioning in the semi-structured interviews (discussed in section 6.5-6.8).

4 Literature Review

Literature is reviewed briefly in four areas: (a) teachers' beliefs and ICT research; (b) change as a long-term process; (c) the implications of ICT for pedagogy; (d) students as autonomous learners..

a Teachers' beliefs and ICT

ICT research, as in many areas, draws attention to the need to consider teachers' beliefs and also to whether teachers actually know how to use ICT. For instance, Egbert *et al.* (2002, 108-126) developed a questionnaire based on a literature review for 20 ESL and FL language teachers who had taken the same CALL training; how language teachers applied practical experiences from computer-assisted language learning training to their teaching in an ICT environment was studied. Egbert *et al.* (ibid) draw attention to the need for there to be a fit between teachers' philosophies of language teaching and learning and what teachers see as capabilities of technology to facilitate teacher use of the technology in their classrooms. Czerniak *et al.* (1999, 1-18) elicited and categorised open-ended questionnaire feedback from 283 Ohio science school teachers regarding attitudes towards the implementation of ICT in the school science programmes. Although the authors highlight the limitations of their study, they maintain (1999, 14) that ICT-research should focus on how teachers' beliefs can facilitate rather than limit ICT reform efforts, and educators should examine teachers' beliefs before planning classes, workshops or seminars. Parks *et al*. (2003, 1-21) looked at how teachers' conceptualisations of teaching and other contextual factors related to their actual use of technology. Longitudinal observations and several hours of video recordings of students from three classes were obtained; three teachers were also recorded during interviews.

[8] In part 4 (The Literature Review) I discussed the conceptual framework underpinning the research.

[9] 'petite' generalisations (Stake 1995, 45) would be drawn based on a small 'particularistic' database; the case study contributions to 'disciplined science' might therefore be slow, tendentious and often esoteric.

[10] The aim of the writer's research will be to describe and analyse how to provide adequate support for teachers during the **introductory** teacher-training stages of ICT.

Parks *et al.* (ibid) assert that although computers have been 'hailed' for their potential to revolutionise teaching practice, recent research[53] suggests that change is complex and may be related to teachers' beliefs, in particular, to the way ICT is adopted or rejected by the individual. Warchauer (1999 cited in Parks *et al.* 2003, 2), in a qualitative study involving a college ESL composition teacher, found that instead of promoting the critical collaborative learning practices envisaged by the researcher, online resources in an ICT laboratory were used to reinforce traditional literacy activities such as essay writing and grammar activities; factors that were believed to explain this finding included not only the instructor's personal teaching philosophy but also the role of the English language programme and overall mission of the college. Cunnington's *et al*. (2002, 1-20) qualitative study[54] found that even though the use of ICT in tertiary education had many advantages, the benefits did not justify the cost, time and effort that this kind of work entailed. It is to be noted that research into teacher and student attitudes towards ICT often[55] provides one-off detailed questionnaire-snapshots of attitude usually using for instance Likert-type or semantic-differential scales. This might be contrasted with the more qualitative approaches in Parks *et al*. (2003), Warchauer (1999) or Cunnington's *et al*. (2002).

b Change as a long-term process

The idea of change as a long term and complex process is a common theme in the literature on change, for example: (1) Palmer (1993, 166) maintains that in-service teacher training programmes are usually intensive, allowing trainers little opportunity to help teachers explore the implications the innovation will have on their previously established classroom routines and behaviours; (2) Irmisher (1992, 2) states that implementation 'is considered a long-term process not a quick fix'; (3) Williams and Williams (1994, 207) take the viewpoint that if a programme of change is 'thrust upon somebody with little or no knowledge of the change and even less influence over it, it is not surprising that attitudes towards the programme will be ambivalent'. Introducing change quickly also significantly adds to a teacher's workload and can bring a certain amount of anxiety and threat; (4) Most teachers retain practices that lead to improved learning outcomes and ignore those that do not. Therefore a key determinant of lasting change in teaching practices is to demonstrate that the change improves pupils' performance (cited in Guskey 1989, 445). Teachers that perceive no improvement in pupil learning are therefore unlikely to have positive attitudes to change; (5) Fullan (1998, 253-262) brings forward and highlights five key ideas which are thought to be associated with the capacity to understand the fundamentals of change. These are: (i) there are no 'silver-bullet' solutions to change management, the individual must work

[53] For instance Cuban, 1986, 1993; Mehan, 1989; Nicolopoulou & Cole, 1993; Warschauer, 1998, 1999

[54] A naturalistic inquiry was undertaken at the University of Melbourne into the experience base of practitioners who had been engaged in ICT-related learning and teaching. The goal of the study was to look beyond superficial data and examine closely how ICT was fundamentally influencing the nature of teaching and learning. The researchers were interested in the 'untold' stories of practitioners and participants. The data gathering techniques used in this research depart from the commonly used approaches to quantify attitudes with for example questionnaires. However the authors argue (2002, 19) that generalisability is a function of sampling and that over time a gallery of samples might be used to make meaningful generalisations. It is hoped that the 'gallery' database might provide explanations as to how the use of technology is impacting on teaching and learning.

[55] for instance Egbert *et al.* 2002 Stepp-Greany 2002, Czerniak *et al* 2003, Rakes and Casey 2002.

through problems on his/her own with guidance but no certainty from other sources; (ii) for quality innovations to have their desired impact, individuals must experience a process of redoing (behaviour) and rethinking (beliefs); (iii) resistance and conflict are essential for successful implementation of change; (iv) no amount of political advocacy or technical support will generate success unless relationships improve; (v) the role of emotions on change and hope as 'unwarranted optimism' should be considered more in the change process.

c The implications of ICT for pedagogy

An issue that is prevalent in current ICT research is the assertion that there is a lack of sound pedagogy and training for using the ICT-related materials for instance: (1) Wood (1999, 1) provides an overview of Internet sites that possibly could be useful in the ICT classroom. He states (ibid) that many pedagogical books, articles, and 'exhortations' about the educational significance of the Internet often turn out to be little more than lengthy lists of web page addresses (URLs). It is held (ibid) that what is often missing from the huge array of Internet materials for pedagogic purposes is any clear identification of the new pedagogical opportunities that the Internet offers; (2) Hanson-Smith (2003, 1-11) provides a summary of some of the current practices in ICT classrooms or learning centres. She (ibid) also takes a similar stance to Wood (1999), and asserts that even though much excitement was generated by the use of colour, sound and video in software and over the Internet, the chief failing of multimedia thus far has been the lack of appropriate pedagogy. Hanson-Smith (ibid) claims that time has not been allocated for US high-school teachers to explore software and applications and resources have not been committed to training them in the appropriate ways of using such a language centre. Moreover (ibid), it is argued that many instructors fear machines and believe they cannot enhance learning; (3) Nunan (1999, 52) undertook an exploratory case study[56]. He reports (1999, 51-74) that despite all the interest in using the World Wide Web, little research evidence exists to support claims for the effectiveness of web-based instruction (WBI). Nunan (1999, 71) concludes by asserting 'the obvious' that is, in the end, it is the learning that matters, and the technology is simply a means to that end; (4) Stepp-Greany (2002, 165-180) undertook a questionnaire survey on 449 Spanish students regarding student perceptions about technology use for language instruction. There was a difference in opinion pertaining to the usefulness of ICT components. Furthermore, as students attributed an important role to instructors, it was argued that teachers working in learning environments mediated by technology need support and preparation to adopt new roles; (5) Rakes and Casey (2002, 1) developed a stages of concern questionnaire to analyse the concerns of 659 teachers towards instructional technology; it is argued that one explanation why many teachers, especially more experienced teachers, have not been able to find effective ways to use technology in their classroom, is that the use of technology in the classroom has been considered in terms of simple skill acquisition instead of as a change process. They also (ibid) hold that

[56] A case is defined in the literature as a "bounded instance" (Stake, 1988) that investigates phenomena within the real-life contexts in which they occur. In this study, the bounded instance (Stake 1988) was a cohort of students completing an eight week Web-mediated graduate course as part of a Master of Science degree in TESOL. The purpose of the study was to generate insights rather than to test hypotheses, although it is argued that it is legitimate to draw conclusions and generalizations' Nunan (1999, 53).

adequate teacher training is the key to help teachers to view technology in a positive manner, be comfortable with the technology, and use it effectively before improved student achievement can occur

d Students as autonomous learners

Another recurrent theme in the literature is the idea that in the future students must become more autonomous active learners, and teachers must relinquish some of their power and authority, not to the computer but to the student. For example: (1) Motschnig-Pitrik and Holzinger (2002, 1) undertook a survey involving 1200 teachers in various locations in the USA into Student-Centred eLearning (SCeL); it is claimed (ibid) that there exists empirical evidence proving that students who are given the freedom to explore areas based on their personal interests, and who are accompanied in their learning by a supportive, understanding facilitator, not only achieve superior academic results but also develop socially and grow personally; (2) Cunnington *et al*. (2003, 2) acknowledge the application of ICT in teaching and learning has the potential to change educational practices in significant ways[57]. Moreover, Cunnington *et al* (ibid) hold that initiatives have led to the rise of new roles for teachers such as "facilitators of learning" as opposed to "deliverers of content"[58].

The four literature-review related themes[11] which will form the conceptual basis underpinning the writer's research study are: (1) teachers' beliefs and attitudes towards ICT need to be considered because rejection is likely, if no 'fit' can be found between teacher beliefs and what teachers view as practicable within an ICT environment; (2) change is a complex and long-term process; (3) teachers require sound pedagogy, teacher training and in-service support when using ICT materials; (4) more autonomous learning in the ICT classroom suggests that the traditional student-teacher relationship will change to a student-computer and 'facilitating-teacher' relationship. In researching how teachers' attitudes and practices change over time in a supportive ICT-classroom environment, the writer will attempt to address the four issues discussed above; the research will also provide data relevant to the writer's professional context. How these four areas will relate to this study will be explained in section 5 below.

5. Method orientation

With regard to the research design of the studies described in the literature review presented in section 4, data were either elicited quantitatively, using questionnaires, or qualitatively, in longitudinal case studies. Yet the four issues mentioned above in section 2.5 suggest a longitudinal case study within an interpretative paradigm[12] might be suitable i.e. it would provide a 'thick' description of how attitudes and practice gradually changed over time. The aim would be to describe what happened and to tentatively

[57] Ben-Jacob, Levin & Ben-Jacob, 2000; Rogers, 2000 take a similar stance (cited in Cunnington *et al*. 2003, 2)
[58] de Verneil & Berge, 2000; Evensen & Hmelo, 2000; Salmon, 2000 have made similar findings (cited in Cunnington *et al*. 2003, 2).
[11] These areas were discussed in sections a, b ,c ,d. in section 4
[12] As in Nunan (1999) or Cunnington's *et al*. (2002)

provide possible explanations and interpretations rather than to try to make 'positivist' quantitative conclusions based on 'apparent' concern.

5.1 The interpretative/constructivist paradigm

The basic assumptions (cited in Schwandt 1994, 118) guiding the interpretative/constructivist paradigm are that knowledge is socially constructed by people active in the research process, and that researchers should attempt to understand the complex world of lived experience from the point of view of those who live it. Bassey (1999, 43) maintains that the notion of there being one reality which exists regardless of people, is difficult to accept for the interpretative researcher[13]. An interpretative ontology rejects the notion that there is an objective reality that can be known, rather a researcher would take the stance that the goal is to understand multiple social constructions of meaning and knowledge (Mertens 1995, 11). An interpretative epistemology would require a more personal, interactive mode of data collection. Interpretative methodology would be qualitative with some research questions evolving as the study progresses (cited in Mertens 1995, 13-14). Cohen and Manion (1996, 106-107) state that the interpretative, subjective dimensions of educational phenomena are best explored by case study methods. They (ibid) maintain that variable manipulation to determine causal significance and standardised questions to representative samples of individuals are not required. Stake (1995, introduction) maintains that the qualitative researcher emphasises episodes of nuance (i.e. subtle nuances in data are seen as important), the sequentiality of happenings in context, and the wholeness of the individual. Qualitative data research seeks patterns of unanticipated and unexpected relationships i.e. 'thick' descriptions of 'experiential' understanding and multiple realities (Stake 1995, 41).

5.2 Case study research

Eliciting qualitative data by means of a case study has led to a number of important issues being raised by many prominent researchers (i.e. there are advantages and disadvantages of case-study research). Bassey (1999,1) for instance, maintains that 'the case study is a prime strategy for developing educational theory which illuminates educational policy and enhances educational practice'. Yet Bassey (1999, 23) also holds that even though case studies have made a significant contribution to educational research, they are often regarded with suspicion and even hostility. Moreover, it is asserted (Bassey ibid.) that 'their characteristics remain poorly understood and their potential under-developed'. Adelman et al. (1980, 59-60) however hold that while case study data is 'strong in reality' though difficult to organise, other research data is often 'weak in reality' but susceptible to ready organisation. Adelman et al. (ibid) assert that case studies allow generalisations[14] either about one instance or from an instance to a class, moreover their

[13] Bassey (1999, 43) holds that reality is seen as a construct of the human mind. People perceive and so construe the world in ways which are often similar but not necessarily the same.

[14] Yin (1994, 35-36) uses the term 'external validity' with reference to findings that are generalisable beyond the immediate case study. A case study is thought to be reliable if the investigator followed the same procedures as described by an earlier investigator and arrived at the same findings and conclusions. Bassey (1999, 65-90) however argues that as case studies are singularistic, they are not chosen as a typical example, so issues of external validitiy are not applicable. It is also claimed (ibid.) that an alternative to reliability and validity is the concept of trustworthiness.

unusual strength lies in the subtlety and complexity of the case in its own right. Cohen and Manion (1989, 124-5) also take a similar viewpoint and maintain that case-study researchers typically analyse the characteristics of an individual unit. The purpose of such analysis is to probe deeply into the multifarious phenomena that constitute the life cycle of the unit with a view to establish generalisations about the wider population to which that unit belongs. It is thought (Cohen and Manion 1989, 123) that case studies begin in a world of action and so their insights may be directly interpreted and put to use for institutional feedback. Stephen Kemmis (1980: 119-120) states the stages in a case study might comprise: the conceptualisation of a research problem, the investigation of this problem, the interpretation of findings, and their cautious and rigorous application in the world beyond the study. Stenhouse (1988, 49) maintains that case-study generalisation and application are matters of judgement rather than calculation, and task of case study is to create ordered reports of experience which invite judgement and present evidence to which judgement can appeal. Stake (1995, 2) describes case study research as the study of the peculiarity and complexity of a single case, and maintains (1995, 7-13) that researchers often make assertions invoking the privilege and responsibility of interpretations i.e. 'petite' generalisations are drawn based on a small 'particularistic' database. It is however held that case study contributions to disciplined science are slow, tendentious and often esoteric (stated in Stake1995, 45). When 'how' or 'why' questions are being posed or when the focus is on a contemporary phenomenon with a real-life context, in general case studies are the preferred research strategy (cited in Yin (1994, 1). Yin (1994, 9-10) however draws attentions to three major concerns appertaining to case studies: firstly, it is held that too many times the case study investigator has been 'sloppy' and allowed equivocal evidence or biassed views to influence the direction of the findings and conclusions; secondly, it is maintained that case studies provide little basis for scientific generalisation[15]; thirdly, it is thought that case studies take too long and result in massive unreadable documents.

Case study research can take many forms, for instance: (1) Stenhouse (1985: 49) uses the term 'educational case study' to refer to research that is concerned with the understanding of educational action i.e. researchers attempt to enrich the thinking and discourse of educators by the development of educational theory; (2) Bassey (1999, 41) defines 'case study action research' as research that is carried out by teachers or managers who are trying to make beneficial change within their workplace. Bassey (ibid.) argues that in order to do this it is first necessary to understand what is happening and to evaluate it, then to introduce change and evaluate the new situation; (3) Parlett and Hamilton (1977, 10) state the aim of illuminative case study evaluation is to discover and document what it is like to be participating in the scheme, whether as a teacher or pupil. Furthermore such case study research should discern and discuss an innovation's most significant features, recurring concomitants and critical processes; (4) Yin (1993, 5) state that an exploratory case study is aimed at defining the questions and hypotheses of a subsequent study explaining causes and effects, whereas a descriptive case study presents a complete description of the phenomenon within its context. Yin (ibid.) sees attempts to discover

[15] Yin (1994, 9-10) however asserts that case studies are generalisable to theorectical propositions and not to populations or universes. Bassey (1999, 42-48) holds that a 'fuzzy' definition is a qualified generalisation, carrying the idea of possibility but no certainty

theory by directly observing a social phenomenon in its raw form, in terms of the grounded theory approach of Glaser and strauss (1967). As the aim of this writer's research is to describe and tentatively interpret with a view to facilitate change, the research could partly be defined as an 'educational case study' in the Stenhouse (1985, 49) sense or possibly partly a 'case-study action research' in the Bassey (1999, 41) sense; it might also be classed as an 'illuminative case study evaluation' as in Parlett and Hamilton (1977, 10) or an exploratory case study as in Yin (1993, 5) above. Though Bassey (1999, 35) warns that to draw comparisons between the various case-study positions and terminology is a 'dangerous game', because it is difficult to know what writers really mean by the terms they use. Stages in conducting case study research might comprise (cited in Bassey 1999, 65-90.): (a) identifying the research as an issue or problem; (b) asking research questions and drawing up ethical guidelines; (c) collecting and storing data[16]; (d) generating and testing analytical statements; (e) interpreting or explaining the analytical statements; (f) deciding on the outcome and writing the case study.

5.3 Disadvantages of questionnaires

In this study, questionnaires will not be used. Dornyei, (2001, 207-208) maintains, appertaining to questionnaires, that the validity of such instruments has been questioned by many. Dornyei (ibid) provides a summary of the threats to validity, one main issue relates to the assertion that people do not always provide true answers about themselves. Dornyei (ibid.) also holds that some students may provide 'a good guess' about what the desirable, acceptable or expected answer is, and some of them will provide this response even if it is not true. Nunan (1989, 62) argues that the problem with questionnaires is that, having developed our categories and questions before collecting data, we may predetermine, to a large extent, what we actually find. Questionnaire administration should not be considered a mere 'technical issue', Dornyei (ibid.) states that psychological literature is quite explicit about the significant role questionnaire procedures play in the quality of the elicited responses. In light of the above problems, the writer of this paper holds that undertaking a case study will firstly, help to embrace 'qualitatively' key issues in ICT, and secondly, enable the researcher-writer to work within a constructivist paradigm.

5.4 Sources of data in this research context.

Student[17] and teacher research questions are categorised in table 1 below; they relate thematically to the issues discussed in section 4 (the Literature review). It is these issues that will be used as a basis for 'probing', 'discovering', 'describing' and 'interpreting'.

[16] As regards the collection of raw data, certain issues/questions need to be considered (stated in Bassey 1999, 65-90), for instance: (1) has there been prolonged engagement with data sources? (2) has there been persistent observation of emerging issues?; (3) have raw data been adequately checked with their sources?; (4) has there been sufficient triangulation of raw data leading to analytical statements?; (5) has the emerging hypothesis been critically tested against analytical statements?; (6) is the research sufficiently detailed and does the case record provide an adequate audit trail?

[17] Even though the teacher is the focal point in this case study, feedback from students (see table one) will be channelled to teachers via the co-ordinator. (please refer to figure one).

Borg (2003, 102-105) questions pertinently what counts as evidence of attitude change i.e. responses to questionnaires, retrospective commentaries, various forms of interviews, observed or reported classroom practices. Some indicators of change in both attitude and practice might be for instance: (1) is there any evidence that a teacher is building on, adapting or 'personalising' what he/she had initially been taught or to which he/she had been introduced?; (2) Do teachers respond to student or co-ordinator feedback by 'rethinking' or 'reworking' ICT activities? If so, how?; (3) Is change, in a supportive environment, (more) long-term?; (4) How are ICT-related problems addressed?; (5) How does perceived teacher 'success' in the ICT classroom affect change?

Table 1. The Interview Schedule

Four categorised questions based on the literature review will be used to elicit data from teachers[18] and one categorised section will be used for eliciting feedback from students[19]

Section 1. Issues relating to teachers' beliefs and attitudes towards ICT.

- What do you think of ICT capabilities?
- Are there any problems?[20]
- What are the strengths of ICT?
- What potential does ICT have for developing learning?
- Does anything go against your teaching beliefs?
- Are you (still) a technophile or technophobe? Why?
- Do you (or teachers you know) have negative or positive attitudes towards ICT usage? Why?
- Is there/can there be a 'fit' between teacher philosophies and ICT?

Section 2. Issues related to change as a complex and long-term process.

- Is there any ICT success story you would like to discuss?
- Do you [go a 'step further' and] adapt WWW materials your own lessons? Do you retain any practices?
- Does WWW usage/ICT classroom improve learning? Why/how/why not?
- Has enough time been allocated to explore software?
- How do you (or teachers you know) apply technology to your (their) practice? Has your teaching practice changed? Why/What/How?
- Do you feel any pressure to use ICT? Why?
- Do you feel you should receive some recognition for using ICT facilities? What?

[18] These are the key case-study issues discussed in section 4 (The Literature Review).
[19] Please refer to section 5 (Methods Orientation) and section 3 (Aims and Research Questions)
[20] This question would also be asked in sections 2 to 5 of this table.

Section 3. Issues related to teachers requiring sound pedagogy, teacher training and in-service support when using ICT materials.

- What ICT do you use? How/Why?
- Do you need help with anything? What?
- With regard to WWW usage, do you need any support? What kind of support?
- What constitutes sound pedagogy for WWW usage?
- Can e-learning be made (more) effective? How?

Section 4. Issues related to the role teachers may have in the ICT classroom i.e. students being more autonomous.

- How do you perceive your new teacher role in an ICT environment?
- What new teacher skills are required?
- Are students more autonomous and has the teacher become a facilitator? If yes, in what way? Can teacher training help teachers be more comfortable with their new roles in the ICT classroom? How?

Section 5. Student feedback questions[21]

- What do you think of ICT capabilities?
- Do you have any problems in the ICT classroom?
- What ICT do you use? How?
- Do you like or dislike anything you do in class? What/why?
- WWW usage, does it improve learning? Why/How/Why not?
- Are you (still) a technophile or technophobe? Why?
- Do you (or students you know) have negative or positive towards ICT usage? Why?
- Do you feel more independent in an ICT classroom? How should a teacher help you?
- Can e-learning be made more effective? How?

6. The study

The literature review described the conceptual basis underpinning the research study and also linked this conceptual basis to methods' orientation. In this section, the subjects, tasks, research question, research procedures, data collection, analysis of results, ethical issues and study limitations will be discussed.

6.1 The subjects

The research will be undertaken on two Intercollege ESOL lecturers of any age, sex, nationality, or 'IT-persuasion' and on any of these teachers' students. It is to be noted that the writer's research is not a comparative study but a particularistic and interpretative

[21] Some of these findings would be fed back to teachers so as to help them help their students more efficiently.

study, so participants will not be chosen and compared on the basis of age, sex, nationality or IT-persuasion, but on whether they agree to take part and are students or teachers[22]. Oppenheim (1992, 82) asserts that the subject's motivation is probably the most important determinant both of response rate and the quality of response. In this study no extrinsic motivators[23] will be offered to the interviewee as this may create a bias and so affect the data (maintained in Oppenheim ibid.). Potential interviewees will be told that case-study data may help the language laboratory co-ordinator to become more 'sensitive' to potential problems encountered during the implementation phase of an ICT lab; this in turn may help to reduce possible future teacher 'stress' in Intercollege's new ICT laboratory. Teachers that volunteer to take part in the project will be told that a certain amount of commitment is necessary (also see section 3.9 on ethics); the writer, however, accepts that there is a risk that the interviewee may decide to stop taking part in the project[24].

6.2 The tasks

The research tasks will involve using ICT educational materials during ICT lesson time. In particular, specialised licensed educational CD ROMS (e.g. Reward, BBC Interactive English Course, Longman Interactive) and the World Wide Web (i.e. 100's of web addresses) will be used with students in a networked system. All ICT materials will complement or be pertinent to, traditional classroom materials. A management software program will provide opportunities to make use of multi-media 'new' capabilities, such as those discussed in section one of this paper.

6.3 The research procedures

Figure one below provides an overview of how the case-study research instruments will be used. The student, teacher and co-ordinator form a triangular data-flow 'matrix' in figure one. As part of his supportive role, the co-ordinator monitors both student and teacher seeking to observe the presence, absence, and intensity of table 1 'key-issue' types of behaviour that will be relevant to the research question. An attempt would be made to typify/categorise behaviour. If data fitted 'non-problematically' into these categories, the categorised data could then used as the basis for 'probing' key issues in successive structured interviews with teachers and students; as the researcher will not assume that his case-study data will fit 'conveniently' into **quantifiable** categories, this research cannot guarantee a quantitative element. The successive nature of observing, data annotation/analysis, and interviewing might help to build up a 'complex' jigsaw picture of what may have happened. This could then be tentatively interpreted. Furthermore, Miles and Huberman (1994, 49) hold that analysis during data collection lets the fieldworker cycle back and forward between thinking about the existing data and generating new strategies for collecting new often better quality data.

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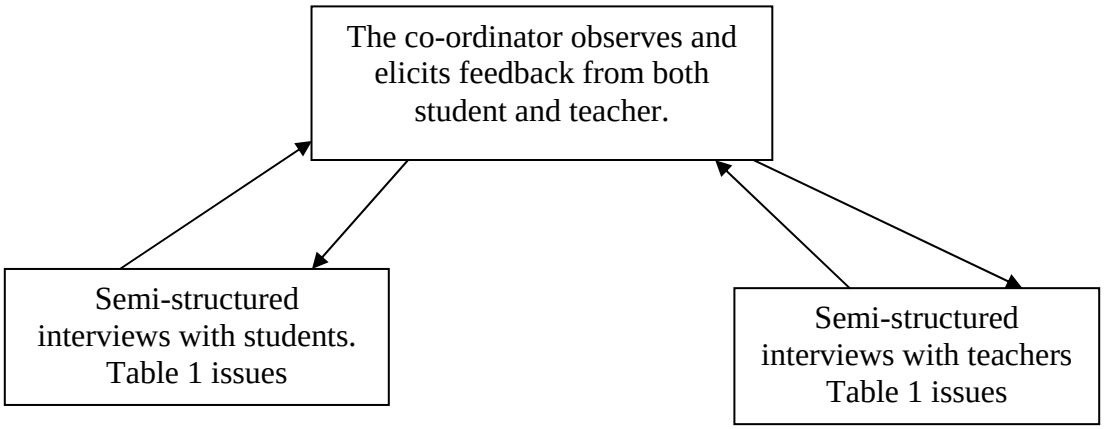
[22] In this study, as the language resource centre co-ordinator's main responsibilities include staff induction and the implementation of an ICT innovation, it is the teacher that will be of focal research interest and not the student.

[23] Oppenheim (1992, 82) maintains that extrinsic motivators e.g. such as a promise of reward, the payment of expenses or a gift may sometimes be effective in persuading people to participate.

[24] If one teacher dropped out of the study, then only one set of data would be analysed. If both teachers dropped out of the study, the study would have to be repeated from the beginning with new subjects.

Figure one: the student, teacher and 'supportive' co-ordinator triangular data-flow 'matrix'



6.4 Data collection

The following data-elicitation techniques will be used in this case study: (a) semi-structured interviews with teachers and students; (b) observations. The study will be undertaken during any 4-6 month ICT semester (though this time span may be increased if circumstances allow) at Intercollege. It is expected that teachers will have access to the centre once a week or once a fortnight for 90 minutes. Student and teacher interviews would take place fortnightly after each lesson; approximately six separate teacher interviews will take place during this period i.e. depending on whether lessons take place weekly or fortnightly. Observations will take place once a month.

6.5 Semi-structured interviews

Semi-structured interviews on teachers; the aims of these interviews are to: (a) elicit qualitative data using the questions presented in table 1 (please refer to section 5.4), about the issues discussed in section 4; (b) to give teachers an opportunity to discuss problems, worries and successes. This may also help to improve the relationship between co-ordinator and teacher. The aim of the semi-structured interviews on students will be for the co-ordinator to access data real-time using the student questions presented in table 1. Stake (1995, 67) asserts that even though there are many practical considerations, the interview is the 'main road' to discovering and portraying the multiple views.

6.6 Conducting a semi-structured interview[26].

Drever (1995, 1) maintains that semi-structured interviews, with the use of, for example prompts and probes[27], can yield a variety of information about preferences, opinions,

[26] Semi-structured interviews as defined in Drever (1995).

[27] These terms are used in the Drever (1995, 23-25) sense i.e. prompts are directed towards what the interviewee may know but has not mentioned yet. Prompts encourage the interviewee to talk but they must not put words into the interviewee's mouth. Probes are directed at what people have already said i.e. asking them to clarify and explain, but not as a rule to justify or defend their position.

experiences, motivations and reasoning. Drever (1995, 18) states that an interview schedule[28] serves to guide a semi-structured interview discussion. The interviewee will be invited to select what is at the forefront of her/his thinking as recommended in Drever (1995, 21); this will be done by asking the interviewee to discuss any problems she/he had encountered working in an ICT environment. The interview will start with a preamble that reminds the interviewee what she/he has agreed to do and what the interview is about. Drever (1995, 26) holds this allows any misunderstandings to be cleared up. All the interview questions will avoid using obscure or patronising terms and are clearly worded. Oppenheim (1992, 81) holds that open-ended questions are important because they allow respondents to say what they think with greater richness and spontaneity. All interviews will end with a general 'sweeper' question; Drever (ibid.) recommends using questions of the type : '*Is there anything else you want to say about this topic?'* or *'Is there anything else you want to ask me?'* . Interviewee responses will be categorised/typified and then used as the basis for 'probing' key issues in successive structured interviews with teachers. The successive nature of observing, data annotation/analysis, and interviewing is thought to help to build up a 'complex' jigsaw picture of what could have happened; this could then be tentatively interpreted.

6.7 **Collecting and transcribing data**

Bassey (1999, 81-83) holds that the advantage of recording for the researcher is that she can attend to the direction rather than the detail of the interview and then listen intently afterwards. Each interview will be recorded on a separate c90 cassette[29], and the tape-recorder itself will be positioned so as to ensure a high quality recording. As soon as the interview has ended the details of the interview will be written on the cassette. With regard to transcribing the interview recording, Bassey (ibid.) recommends: (1) transcribing the entire recording at once, though this may take between five to ten[30] times as long as the actual interview. There may be a lot of redundant text because of the intrinsic nature of speech; (2) paraphrasing or making a shortened report of the recording. It is believed (Bassey ibid.) that this can be done in about twice the time of the interview. Even though some of the nuances of the initial interview recording may be lost, interview data could be reduced to more manageable units. Drever (1995, 60-61) also takes the view that the purpose of data preparation should be to make the material manageable, while at the same time retaining as much of the original information as possible and avoiding any distortion. Drever (ibid.) states that even though some physical data[31] is lost

[28] An interview schedule usually consists of several pages held on a clip board. The interviewer reads off the questions, marks off points covered, and occasionally makes extended notes. The schedule is important, because it helps the interviewer to get through the interview without drying up, missing out questions, going off at a tangent, leading or confusing the respondent (cited in Drever 1995, 18).

[29] Bassey (1999, 81-83) maintains that video recordings can be a problem because they entail pointing a camera at someone and thus making it clear that he and she is being directly observed.

[30] Bogdan and Biklin (1994, 129-131) hold that if interviews are to recorded and transcribed, a good rule to follow is 'think short' i.e. to limit the interview's length; a one-hour interview when typed amounts to 20-40 typewritten pages of data. This in turn would mean hundreds of hours of transcription time. Moreover, if someone else is typing it, it can mean a great expense to the researcher.

[31] Physical data (the writer's term) refers to body language, facial expressions or tone of voice. Drever (1995, 60-61) however claims that some of the nuances of talk can be transcribed by using symbols and comments, though recommends that the system be kept simple.

in verbatim transcriptions and that transcribing is laborious, verbatim transcriptions provide a true record of the interview recording i.e. they may safeguard against distortions such as the interviewer leading the respondents, reporting selectively or misrepresenting their answers. Drever (ibid.) maintains that although partial transcriptions reduce transcription time because they only provide answers to certain questions, there may be a risk that data will be distorted unconsciously by a personally biased interviewer. However safeguards can be applied to counteract this possible problem; Drever (ibid.) for instance recommends: (1) using only the words and phrases used by the interviewee; (2) getting a colleague to check for any subjective distortions by reading a sample of the summary while listening to the tape. Giving the summary and tapes back to the interviewee is not thought to be very effective as the interviewee may not wish to contribute on the content of the summaries, rather, he or she may prefer to expand on, or explain, what had been said earlier (cited in Drever ibid.). In this study, for practical reasons, the researcher will only partially transcribe interview recordings, as in Drever (ibid). However, only the words and phrases used by the interviewee will be used and a 'third person'[32] will check for any subjective distortions by reading a copy of the summary while listening to the recording; please note that the interviewee will be given the opportunity, if he or she so chooses (also discussed in section 10, Ethical Issues), to comment on the content of the summary.

Bogdan and Biklin (1994, 129-131) are of the opinion that transcribing issues that only address the researcher's concerns saves a lot of time and expense. Another suggestion (cited in Bogdan and Biklin (1994, ibid) is to transcribe the first interviews completely and then narrow what is transcribed in later interviews; as the study goes on, the researcher is thought to have a better idea about the focus and be more sensitively selective in what is typed. Furthermore, Bogdan and Biklin (1994, 154-159) recommend researchers make decisions so as to narrow the field of their study, in particular: (1) the researcher ought not to pursue 'everything', rather she should put limits on what might be analysed in detail; (2) the researcher/interviewer should make decisions about what kind of study will be accomplished. In this case study the writer brings 'general' questions to the study because they help to give a focus to the process of collecting data. However, although it is the researcher's aim, once he has entered the field, to assess which questions are relevant[33] and which might be reformulated to direct the study, this approach may 'fall though' because 'new' and 'interesting' data that cannot be ignored may arise during subsequent interviews. Therefore, the researcher realises that the process of building on previous data-collection sessions may not necessarily provide an accurate description[34] of what was happening.

[32] Another TESOL-qualified teacher that does not know the interviewee personally.

[33] Yin (1994, 57) holds that few case studies will end up exactly as planned. Inevitably the researcher will have to make minor if not major changes, ranging from the need to pursue an unexpected lead to the need to identify a new case for study i.e. the skilled investigator must remember the original purpose of the investigation but then must be prepared to change procedures or plans if unanticipated events occur.

[34] It is the aim of this study to describe and tentatively interpret.

6.8 The interviewer

Drever (1995, 4) states that interviewing colleagues is sometimes problematic because it is difficult to maintain formality with them. Moreover, Oppenheim (1992, 89-90) holds that too much or too little rapport in interviews would be undesirable. In this research, in order that the interviewee takes the interview seriously, the interviewer will aim to remain detached and professional, yet appear relaxed, open, friendly and trustworthy[35]. The aim of the each interview will be explained to the interviewee, and the interviewee will be thanked at the end of each interview. Yin (1994, 94) however asserts that because data collection is not routinised in case studies, the demands of a case study on a person's intellect, ego and emotions are far greater than those of any other research strategy. Yin (1994, 56) claims that asking questions requires an inquiring mind; it is held (Yin ibid) that this is a major prerequisite during the data collection, and not just before or after the activity. As specific case study information is not readily predictable, Yin recommends (ibid) that the fieldworker should constantly ask why events appear to have happened or appear to be happening.

7. Observations

These mainly aim at formulating additional questions[36] based on what was observed in-class for student and teacher interviews[37]. Yin (1994, 87) is of the opinion that observational evidence is often useful in providing additional information about the topic being studied. Access to the site will be negotiated and a 'basic' observation checklist, as recommended in Nunan and Richards (1990, chapter 5) or Wajnryb (1992) would be drawn up. In this research, the observations will be structured. There are two main forms of observation: **structured** and **unstructured**[38]. In structured observation the researcher seeks to only observe the presence, absence and intensity of clearly specified types of behaviour. A researcher therefore needs to know a lot about the area under study, and should be in a position to know what types of behaviour will be monitored; in this way, only data relevant to the research will be collected. The research instrument checklist would be designed by the observer and would be piloted a number of times. It would comprise the following sections: (1) whose behaviour (students' or the teacher's); (2) categories of behaviour to be observed (related to table 1 issues), (3) psychomotor elements (posture, gesture, movement), activity (repetition etc), content (lesson-related talk), sociological structure (role, sex, race etc), physical environment (room layout etc); (4) what counts as an act of behaviour; (5) time units i.e. unit sampling (every x

[35] Yin states (1994,57) that the interviewer should be a good listener. Being a good listener means being able to assimilate large amounts of new information without bias.

[36] i.e. apart from table-one questions presented in section 5.4.

[37] Recording behaviour real-time, noting any 'unforeseen' critical incidents might also provide useful 'leads' that could be followed up in interviews or retrospectively with students. Observation might be classified as more non-participant-like than participant-like i.e. the presence of the observing-researcher co-ordinator would be expected initially because the co-ordinator's job is to be present, if the teacher requires assistance.

[38] In unstructured observations the observer can take part in the activity. The main advantages are: (1) the observer can see the subject group in its natural environment; (2) the researcher can record behaviour real-time, note critical incidents and can rely less on active co-operation of subjects. Unstructured observations however have some disadvantages: (a) they are less economical on time; (b) they produce masses of data; (c) they require a great deal from the observer (NB validity vs. reliability).

seconds/minutes), natural sampling (no fixed time unit); (6) methods of classifying the behaviour (scales to all or none). The writer however acknowledges that the most frequent problems in structured observations are: (a) inadequate definitions of what behaviour constitutes a given concept; (b) some observers doubt their own judgements (lack of confidence); (c) the observer effect (the presence of an observer may change the environment).

8. Data analysis—The results

With regard to data collection, data management will be an important skill as it is expected that an '*enormous*'[*] amount of data will be generated; within the practicable confines of the study, specific and germane comparisons (i.e. between previous interview data) and interpretations of the data collected will be made with the aim of assessing their usefulness in relation to the initial research question. Also an evaluation of the degree to which the case study has accomplished its aims, together with an account of the ways in which the process of research may have led to changes in the initial research question formulation (or for that matter, generated other interesting questions) might prove useful for future research.

Drever (1995, 64-65) holds that researchers tend to develop their own 'personal toolkit' for analysing semi-structured interview data, this often comprises simply coding and counting responses using methods similar to questionnaires. Drever (1995, 68) however recommends extracting categories from the data itself, as there is a danger that predetermined categories may distort the data. The writer of this article cannot know whether research data will lend itself conveniently to categorisation, and therefore will not 'force' data into categories for the purposes of quantitative analysis. One way of extracting categories from interview data could be (cited in Drever 1995, 68-69.): (1) to select one of the fuller interview responses and summarise it as a list of short points; (2) to repeat this process with several more answers; (3) to compare lists with a view to making a 'categorising' composite list. Yin (1994, 102) takes a similar stance in stating that the researcher's own rigorous style of thinking and presentation of sufficient evidence along with careful consideration of alternative theories is an essential analytical strategy. Yin (1994, 103) also draws attention to the possible weaknesses of quantifying data and asserts that coding events into numerical form[39] may fail to address the needs of doing analysis at the level of the whole case. The researcher's ultimate goal therefore will be to treat the evidence fairly[40], to create convincing analytic conclusions, and to attempt to rule out alternative interpretations[41] (as recommended in Yin 1994, 103). Moreover, the researcher holds that from the beginning of data collection, he will be starting to

[*] Bassey (1999, 83) Data analysis comprises 'struggling with the enormous amount' of raw data in order to produce a meaningful and trustworthy conclusion which is supported by a concise account of how it was reached.

[39] Miles and Huberman (1984, 54) however maintain words are 'fatter' than numbers and usually have multiple meanings. This makes them harder to move around and work with, moreover, 'words are meaningless unless you look backwards and forwards to other words'.

[40] Yin (1944, 103) holds that a second suggested approach has been to use various analytic techniques (e.g. Miles & Huberman 1984).

[41] Yin (1994, 123-125) takes the view that regardless of chosen specific analytical strategy the researcher should: (1) show that all the available evidence was considered; (2) analyse exhaustively all rival hypotheses and interpretations; (3) address the most significant part of the case study; (4) bring his own prior expert knowledge to the case.

decide what things mean, and will be 'noting regularities, patterns, explanations, possible configurations, causal flows and propositions'[42] (as recommended in Miles and Huberman 1984, 22). In this study data will be coded as in Bogdan and Biklin (1994, 165-166) i.e. it is suggested that the researcher read through the data for certain words or phrases that 'stick out or repeat'; categories will be words or phrases that represent these topics.

9. Limitations and problems that may be encountered.

This study has a number of potential weaknesses or areas where it could potentially be criticised. For instance: (1) only 'petite'[43] generalisations can be drawn based on the small 'particularistic' database.; (2) the 'reliability' of the structured interview data could be questioned[44]. Oppenhein (1992, 211) for instance, asserts that people are often unaware of their own motives and attitudes. Moreover, it is held (Oppenhein ibid) that most 'people' invent logical reasons for actions whose origins are far from rational and 'people' very often prefer not to say negative , unpleasant or critical things unless they have specific complaints; (3) the time period of the case study might be too short (please refer to section 6.4, data collection); (4) recording, summarising, validating and analysing the enormous amounts of data may inevitably be affected by some researcher bias; (5) structured observation data has disadvantages (discussed in section 7); (6) the lab materials available to teachers would be limited, i.e. the language resource centre would be a completely new innovation at Intercollege and it would require several years to build up a useful database of ICT-related educational materials suitable for Intercollege staff and students; (6) even though undertaking a pilot case study could assist the researcher to create pertinent 'question' lines and even provide some conceptual clarification for the research design, within this context, there are practical considerations for example, using valuable 'lab' time for a pilot case-study would be problematic with administration[45].

10. Ethical Issues

Bassey (1999, 73-77), with regard to the ethics of research, discusses a number of issues, these issues include: (1) researchers should feel free[46] to investigate, ask questions and express ideas[47]; (2) researchers should have respect for the truth i.e. being truthful to data collection, data analysis and the reporting of findings is essential; (3) the researcher should have respect for the person(s) being investigated: data elicited from persons should be done in ways that acknowledge initial data ownership and which should respect

[42] Miles and Huberman (1984, 22) maintain that the competent researcher holds such conclusions lightly, maintaining openness and scepticism. It is held that as new data enter the picture, new display forms evolve, conclusions get bent and revised (cited in Miles and Huberman 1984, 252).

[43] This term is used by Stake (1995, 45)

[44] For instance, would teachers really say what they thought? Would they be under institutional pressure to appear pro-ICT? Would student data regarding ICT be reliable? To what degree would students be afraid to say what they really thought? Will teachers want to take part in so many structured interviews?

[45] However, the researcher would pilot the observation schedule.

[46] Bassey (1999, 73-74) calls this type of 'research freedom' 'respect for democracy'

[47] Bassey (1999, 74) however states that such freedom is subject to responsibilities imposed by the ethics of respect for truth and respect for persons: it is held (ibid.) that provided that these responsibilities are fulfilled, researchers can do these things without endangering themselves or their livelihoods.

the dignity and privacy of persons being researched. However Bassey (1999, 74) warns that the problem with these ethical values is that they may clash. Pertaining to respect for persons in case study research (issue three above), Bassey (1999, 77-78) draws attention to the need to ask what arrangements have been made for transferring the ownership of the record of utterances and actions to the researcher i.e. this would enable the researcher to compile a case record. Bassey (1999, 78) holds that the usual convention is that utterances and actions, recorded on tape and then transcribed, should not be entered into the case record of the research until the person concerned has had an opportunity to read the draft version and amend it if she or he considers it does not represent the truth; however Bassey (ibid.) also states that the researcher needs to assess whether such amendment is appropriate in the circumstance of the enquiry. The researcher should also, if necessary, make arrangements for identifying or concealing the contributing individuals and the particular setting of the research (stated in Bassey ibid.). Bogdan and Biklin (1994, 53) hold that subjects ought to enter research projects voluntarily, understanding the nature of the study, the dangers, and the obligations that are involved. They (ibid.) also take the view that the subject's identity should be protected so that the information collected does not embarrass or harm[48]. Bogdan and Biklin claim (ibid.) that the consensus opinion feels that the research interest should be explained to the subject, and the subject's permission should be given to proceed.

The information derived from student and teacher interviews is seen as invaluable for the co-ordinator whose job it is to develop a suitable and 'useable' ICT learning environment. The co-ordinator has access to everything the student does during the lesson via the ICT-classroom mother terminal. Even though accessing information via a mother terminal without the knowledge of the student is normal practice in an ICT-classroom[49], publishing the information without the knowledge of the participant will be felt unethical. Before the case study commences, a brief written description of the intended casework will be offered with expectations of any plans to anonymise participants; permission will then be sought from all research participants to undertake and publish the findings of the research. The teacher and students will also be informed that agreeing to take part in the study will denote a certain amount of personal commitment; they will, however, at any time and for any reason, be allowed to leave the research study if they so choose. Oppenhein (1992, 83-84) maintains that no harm should come to the respondents as a result of their participation in the research[50]. Interviewees will be given an opportunity, if they so choose, to read a draft interview transcription summary and amend it if they consider it does not represent the truth[51]

[48] Bogdan and Biklin (1994, 53) argue that anonymity should not only extend to writing, but also to the verbal reporting of information that has been learned through observation..

[49] management software programs in a networked system have a variety of such monitoring functions

[50] Oppenheim (1992, 83-83) states that interviews may have to be abandoned if the respondent is upset i.e. the respondent has the right to privacy and the right to refuse to answer certain questions or to be interviewed at all.

[51] Interviews will be transcribed by a scribe; it is hoped that within 1-2 days of an interview, the interviewee will be transcribed and ready for interviewee comment.

11. Discussion

A discussion would then follow interpretation of case-study data. It would draw attention to interpretations that were felt to be relevant to the writer's professional context, a wider ICT audience and future research. The range of possible audiences might include: (1) colleagues in the same field; 2) policy makers and practitioners; (3) special groups such as students; (4) funders of ICT-related research. With regard to one possible anticipated product, how working in an ICT environment changes teachers' attitudes to teaching could be of fundamental importance to those that want to facilitate the process of change. How or whether ICT affects learning is also of relevance. The writer's research project aims to address tentatively these questions by presenting relevant qualitative case-study data.

12. Conclusion

'Blind rejection' of ICT could be as inadvisable as 'blind acceptance' because both non-ICT and ICT teaching are developing research areas. Moreover, neither is likely to 'go away'. However, what is not clear, is whether, or to what degree, there will be a 'conflict' between the two. The analogy of the 'Cyprus Problem'[52] may be pertinent: the solution could be finding ways to live together in peace through a greater understanding of how both peoples can help to develop a common land.

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