Practitioner-based research in Information Systems

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Abstract

A practitioner is a professionally employed person in a selected discipline such as information and communication technologies (ICT). ICT practitioners often operate in the domain of Information Systems (IS), the social science branch of ICT. Practitioner research comprises of research that practitioners undertake with a view to the advancement of their practice. Questions arise in respect of research conducted by ICT practitioners: (1) What is the context of the IS professional when conducting practitioner-based research; and (2) Does practitioner-based research have a theoretical base and does practitioner-based research challenge the traditional dichotomy between positivist and interpretivist research in IS? An investigation and discussion of these questions in the IS discipline is the objective of this article.

In this article, ICT practitioner-based research in organisations is discussed. Some philosophical underpinnings of practitioner-based research are probed and a reflection on practitioner research is given. It is suggested that active ICT practitioners are a necessity in the IS research domain. Their participation requires that the actual context in which IS practices are conducted, should be analysed. To ensure that such IS research is valid, an epistemological base is needed for critical reflection and thoughtful action from which to draw.

Keywords: ICT practitioner, practitioner, practitioner-based research, reflective practitioner, transdisciplinarity.

Disciplines: computer science, philosophy, ethics, research methodology.

Introduction

A practitioner is a professionally employed person in a selected discipline [such as information and communication technologies (ICT)] who concurrently carries out systematic inquiry which is relevant to the practitioner's job (Robson, 2002). ICT practitioners often operate in the domain of Information Systems (IS), the social-science branch of ICT. According to McLeod (1999), practitioner research can be seen as research undertaken by (ICT) practitioners to advance their practice. In South Africa there is strong movement by the professional body that has the interests of the ICT discipline at heart, the Computer Society South Africa (CSSA), for professionalism in ICT. The CSSA sees an ICT

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practitioner as a person engaged in ICT and a registered member of the CSSA (Computer Society South Africa, n.d.).

In the workplace environment, IS practitioners who deliver IS services may be involved in general inquiry and research. Such research carried out by IS professionals, is often grounded, local and small-scaled and is seen as a requisite element of good business practice in the workplace environment. This article focuses on the IS professional – one who engages in practitioner-based research in IS in the workplace environment. Consequently, the following two questions arise: What is the context of the IS professional when conducting practitioner-based research? Does practitioner-based research have a theoretical base and does practitioner-based research challenge the traditional dichotomy between positivist and interpretivist research in IS? An investigation and discussion of these questions in the IS discipline is the objective of the article.

The article is structured as follows: first, background to the research is given. Then locating the IS discipline is explored. Following thereon is a discussion of the CSSA. Practitioner-based research in organisations is then discussed. Some philosophical underpinnings of practitioner-based research are then probed. Thereafter, we reflect on practitioner-based research. The article ends with concluding remarks.

Background

There are many definitions of science. Science is traditionally regarded as having two major branches, natural sciences and human sciences. The natural (or physical) sciences that study subjects such as Chemistry and Physics use mainly empirical methods.

> *[P]hilosophers of science writing in the tradition of the physical or natural sciences are likely to see theory as providing explanations and predictions and as being testable* (Gregor, 2006).

Human sciences consist of the social sciences (such as Economics, Psychology and IS) and the humanities (Arts, Languages and Philosophy). The social sciences often follow the natural sciences in its use of empirical methods to test hypotheses, and this approach is called positivism. The humanities tend to use mainly a logical approach (reasoned expositions). The concept of testable theory creates the perception that scientific endeavours are objective, but Einstein (1950) suggests that

> *[s]cience is the attempt to make the chaotic diversity of our sense-experience correspond to a logically uniform system of thought.*

More recently, Gould (1980) indicates that

> *[s]cience is not an objective, truth-directed machine, but a quintessentially human activity.*

Both these definitions suggest that

> *the process of carrying out research is highly subjective, depending on the intuition and the inspiration of the researcher (Remenyi, Williams, Money and Swartz, 1998).*

Interpretivism is the research philosophy that believes that knowledge is not simply

discovered but created. Interpretivism's point of departure is that realities are constructed and are known subjectively [cf. Oates (2006); Myers (2009)]. The two major research philosophy ideologies in the Western tradition of (social) science are interpretivism and positivism (Galliers, 1991). From the body of literature, it is evident that much research has been carried out by researchers in ICT in the business- and management-world workplace. Some such research has been conducted by practitioners in the IS branch of ICT using either positivist or interpretivist approaches.

Babbie and Mouton (2001) indicate that scientists must submit their

> *research decisions constantly to critical reflection (which theory to select; which indicators to use in measuring a phenomenon; which research design to choose …).*

In the world of IS a considerable amount of IS research is conducted using the positivist research tradition (Pather and Remenyi, 2005) and less using interpretivism (Klein and Myers, 1999). Over the years, the study of IS has changed radically and these changes have resulted in the subject being pushed to a point where it is now very eclectic (Benbasat and Zmud, 2003). Given this eclecticism, it is not surprising that the IS community of researchers have presented a variety of research methodological arguments for their research (Pather and Remenyi, 2005).

Practitioners' involvement in general inquiry and research is often grounded, local and small-scaled and is seen as a requisite element of good practice in the workplace environment. Schön (1983: 307-325) recommends the combination of research and practice. According to Argyris (1974) practice may be seen as the fulfilling of a collection of ideas so that intended consequences may be achieved. Anandarajan and Lipper (2006: 115) indicate that practitioner-based research vest with the premise that knowledge is socially constructed and where the meanings and values (which comprise knowledge) are distinct from the knower. With this assumption that such knowledge is created rather than being uncovered, practitioner-based research does not make the assumption that, on the same evidence, the same interpretations will be made. Although there is no perfect correlation, it seems that practitioner research tends to be more interpretive while academic research tends to be more positivist (Cole, Chase, Couch and Clark, 2011). This might explain the divide between practitioner- and positivist academic research since it can be ascribed to their primarily distinct reference frames which function via significantly different ideologies and values (Anandarajan and Lipper, 2006: 115). Both practitioner- and academia-based research have roles in the never-ending information trade between the two.

According to Du Toit and Lotriet (2009: 21), the need to apply research successfully in practice is dependent on the active participative and collaborative initiatives of role players in theoretical and practical environments. Such environments in the workplace may be complex and also be divided. Some current thinking on the divide between the theoretical and practical environments, is to try and move *across* these environments (see, for example, Lee and Hubona, 2009; Becker and Niehaves, 2007). We suggest that another possible solution to overcome this chasm is a transdisciplinary approach. Since different disciplines are used to overcome practical problems, different research philosophies are integrated to find seamless, elegant solutions.

Locating the information systems discipline

An interpretive point of departure for research is applicable when phenomena are studied which cannot be proven by hard, concrete facts and empirical observation. Cilliers (2005) pleads for alternative scientific methodologies regarding complex systems, which are modest and provisional, acknowledging that our understanding is limited and changing. Restricting the term *research* to exclusively empirical endeavours is anachronistic, given the contemporary insight that knowledge is never final and beyond dispute. Modest claims about knowledge, however, invite knowledge workers and practitioners to persevere in an ongoing research for meaning and generation of understanding. These 'softer' research goals are the unique foci of especially the humanities. Remenyi *et al.* (1998) indicate that the dominant paradigm in research on business and management is empirical research – this is often found in academic-based IS research. However, Phillips (1998) notes that where both theoretical orientations and practical objectives co-exist in a field, gaps between academic- and practitioner-based research are not uncommon.

Although it is tempting to view ICT as 'the epitome of rational expression', empirical methods of research are appropriate only when related engineering and algorithmic issues are studied. Therefore, the study of ICT is divided into three branches [cf. Oates (2006)]:

- Computer Science, including software engineering, information technology, computer games and animation (the natural science branch);
- Information Science, including web development and multimedia (the humanities branch); and
- Information Systems[3], including business computing, management information systems and human-computer interaction (the social sciences branch).

However, while this division may seem neat, many phenomena often require a mixture of these perspectives for comprehensive research. For example, IS[2] is primarily regarded as a social science, because it investigates socially constructed issues such as the influence of ICT on organisations. Rynes, Bartunek and Daft (2001) note that communities of practitioners have become more prone to ideas that are likely to enhance organisational effectiveness. In South Africa, many ICT practitioners are found in the workplace environment of organisations. But IS also includes factual phenomena, typical of the natural sciences, such as computer programming techniques and algorithms, in order to build efficient software solutions for organisations and industry. Furthermore, IS also has links with the humanities when focusing on the use and application of ICT in education and health care, as well as other humanistic[4] focus areas.

IS should, therefore, be regarded as an interdisciplinary or transdisciplinary science. IS should not only aim to add value to other disciplines but also borrow from other contributing ICT (and non-ICT) disciplines in order to strengthen their alliances. "The *power* and not the weakness of IS research models is precisely that they situate IS constructs within constructs that other disciplines study" (Agarwal and Lucas, 2005: 390). For example, in one of the

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[3] Information Systems is primarily regarded as a social science focusing on the human perspective of information technology (Oates, 2006).

[4] The term *humanistic* is used here as an adjective of the noun *humanities*. It does not refer to the philosophy of Humanism.

research foci of IS, namely Human Computer Interaction, there are elements of all three branches of ICT:

- it studies the behaviour of computer system users;
- the use of professional algorithms to produce human-oriented output; and
- friendly design of interfaces by means of inputs from graphical design and multimedia.

Since IS is a science with strong links to the human sciences, it is recognised that empirical research is not the only valid scientific methodology that can be used to produce quality research. Avgerou (2005) argues for critical research using interpretive methods in IS to complement empirical and formal cognitive methods. She regards critical research as a process that aims to make sense of the investigated scenario, a radical procedure in which researchers' human capacities such as tacit knowledge and moral values are involved. "I see research as the art of putting together research questions with a critical content, multiple theories and epistemological awareness to develop claims of truth. This art cannot place confidence for producing valid knowledge on adhering to a testable theory or research practice" (Avgerou, 2005: 108). Although the knowledge claims contributed by interpretive case studies should be regarded as 'soft' facts, they are still valid and should be generalised in clear formulations aimed at identified target audiences (Barret and Walsham, 2004).

Bondarouk and Ruël (2004) argue for the use of discourse analysis to enable a hermeneutic approach to analyse IS documents. Discourse analysis is another non-positivist scientific method. It is essentially interpretive and constructivist. It tries to

> *give a meaning to a text within a framework of the interpreter's experience, knowledge, time, epoch, culture, and history (Bondarouk and Ruël, 2004: 3).*

It believes that understanding is an open, continuous process and that there is no final, authoritative interpretation.

Some other non-empiricist, qualitative approaches (including theories, strategies and methodologies) in IS are [cf. Myers (2009)]:

- action research (the researcher collaborates with members of the organisation to experiment with possible solutions to a problem);[5]
- actor network theory (the researcher studies the technical and social aspects of ICT as a unity, as well as the interplay between these elements (Mitev, 2009);
- critical realism and adaptive theory (the researcher attempts to combine and synthesise empiricism and interpretivism);
- ethnography (the researcher participates in activities of the organisation that is studied);
- grounded theory (the researcher derives theory by means of qualitative data analysis);
- structuration theory (the researcher regards human agency and social structure as an inseparable duality); and
- practitioner-based inquiry (the researcher tries to close the rift between theory and practice). While practitioner-based inquiry may be 'closely' allied to action research, in action research the main research goal is theoretical in nature, using practical

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[5] Although action research may have a positivist underpinning, most studies are either interpretive or critical (Oates, 2006).

application to enrich theory. In practitioner research, the main goal is practical problem solving. Cochran-Smith and Lytle (1993) note that the distinctive features of problems which trigger research "is that they emanate from neither theory nor practice alone but from critical reflection on the intersection of the two".

Transdisciplinary research is required when knowledge regarding a problem in the IS discipline is uncertain and in cases when there may be significant risk for those ICT practitioners concerned about these problems and how to resolve them. Transdisciplinary research takes into consideration a large array of potential disciplinary paradigms and real-life perspectives. Pohl and Hirsch Hadorn (2007) opine that transdisciplinary research encompasses problem fields so that the complexity of problems can be grasped. Such research recognises the diversity of different viewpoints of problems, it links abstract and case-specific knowledge, and also develops practices and knowledge that promotes the 'common good'.

From this discussion, it should be apparent that it has become acceptable to use other, non-empirical and interpretive methods in IS research. Practitioner-based research may be another methodology that could introduce a 'softer' view and use of ICT in organisations that would be more applicable in the social sciences than the 'harder' approaches that are typical of the natural sciences. Practitioner-based research suggests an open view to any suitable methodology which may enlighten the ICT practitioner in the workplace in an organisation. The ICT practitioner is usually a professionally employed person, who has to maintain their professional competence in the commercial world and workplace environment via their respective professional society, *e.g.* CSSA.

Computer Society South Africa (CSSA)

According to the Computer Society South Africa (CSSA) Continuing Professional Development Policy and Annexure, the CSSA "… is a member of the International Professional Practice Partnership (IP3) of the International Federation for Information Processing (IFIP)" (Computer Society South Africa, n.d.). The CSSA has a responsibility to

monitor and enforce continuing development and maintenance of professional competence of its professional members.

Article 3.4 of the CSSA's Articles of Association states that a purpose of the Society is

To improve the technical and general knowledge and to elevate the professional status of persons engaged in ICT.

The Foreword to the CSSA's Code of Practice (Professional Conduct) states:

The Code of Practice deals with the ways in which all members of the Society are expected to exercise their professional competence … (Computer Society South Africa, n.d.).

During July 2010 the CSSA approved CPD policy for all professional members of the CSSA. The objective of this CPD is "… to assist members developing and maintaining professional competence". According to the CSSA's website "[p]rofessional members bear the responsibility for documenting compliance with CPD activities". From the Annexure, the CPD categories include, *inter alia*, the activities of:

- "Formal Academic Education" (*e.g.* formal education courses where the subject matter relates to ICT);

- "Professional Activities" (*e.g.* author/co-author of an ICT-article in a refereed/non-refereed journal, speaker at a conference, symposium, workshop on an ICT-related topic;
- "Other Education and Learning Activities" (*e.g.* ICT-related courses given by accredited training providers);
- "Self-Directed Learning" (*e.g.* watching videos, DVDs, reading books, journals on ICT related topics); and
- "Volunteer Service" (*e.g.* social responsibility by 'giving back' to an ICT non-profit organisation).

From the above, the greatest number of CPD points awarded is for Professional Activities. This means that ICT practitioners who pursue IS research and publish their research findings will receive CPD points in order to maintain their professional membership status with the CSSA.

Practitioner-based research in organisations

Practitioner researchers often apply theories to their own job situations and experiences in workplace environments. One problem which is often faced by IS practitioners is that their workplace systems and practices should be 'scientific' or 'scientifically founded' (Du Toit and Lotriet: 2009: 21). Practitioner-research may be described as "a systematic form of enquiry that is collective, collaborative, self-reflective, critical and undertaken by the participants of the inquiry" (McCutcheon and Jung, 1990). Individual enquiry is strongly encouraged in a practitioner-research culture. One underlying question of the practitioner researcher is on the continued ICT technical adjustment in the workplace: how can a practitioner researcher improve work practices of a given workplace environment and thereby develop professional excellence? Schön's book, *The Reflective Practitioner* (1983), contests practitioners (when developing professional excellence) to reconsider the role of technical knowledge.

An understanding of work practices has become increasingly important in organisations (Kosaka, 2006: 1056). In many practice-led research projects, research and development are often found in social and work-based organisational communities located in real life; this differs significantly from hypothetical scenarios. These practice-led research projects then give tangible meaning (Costley and Armsby, 2007: 132). Since the emphasis is on real-life research and reflects on real-life and matter-of-fact activities, this results in real-life work being meaningful to practitioner researchers. This focus resonates with transdisciplinary research in that the practitioner develops practices and knowledge that promotes the 'common good'. Gray (2004) indicates that this significance coupled with the associated interpretation of the workplace context should be seen as the beginning location for practitioner researchers to posit and reflect more on their professional practice to formulate an outcome. One such suggested outcome is an emerging improvement on what is taking place in a specific workplace environment. It entails the practitioner building new understandings of the emerging and developing workplace situation. Schön (1983) notes that the practitioner thinks seriously on what is unfolding before him/her, and also on the prior understandings that are present in his/her behaviour. Raelin (2001) suggests that reflection is the process of regularly stepping back - pondering one's actions (and possibly others) in one's immediate locality. Heiskanen (n.d.: 1) suggests that the object of reflection may be in three domains:

- content reflection is about how a practical problem (*e.g.* in an organisation) was dealt with successfully;
- process reflection examines established methods and series of events; and
- premise reflection questions prior beliefs of the problem.

Practice-led research programs often involve a fusing of intellectual and practical abilities – they depend significantly on the community of practice where the research practitioner is involved (Costley and Armsby, 2007: 132). The community of practice of the IS field is defined as professionals who are both in IS practice and IS research (Dixon and Nechis, 1984). For practitioner-based research, the practitioner should therefore make a synthesis of the theoretical and empirical knowledge for the selected research approach. Researchers implicitly or explicitly make certain assumptions in their research and such assumptions are applicable to practitioner-based research. Heiskanen and Newman (1997: 121) suggest and defend their opinion that the implicit and explicit beliefs of practitioners and the processes on which they are based, can be utilised for nurturing practice-based and acceptable scholarly theories of IS.

Some philosophical underpinnings of practitioner-based research

Practitioners judge they have not shaped an acceptable account of practices in any (ICT) practice situation until it has been structured in terms of their embracing theory. This is in terms of reasoning or the principles that underly or explain their chosen facts (Schön, 1983: 273-274). Theory thus has two intertwined significances in: (1) formed structure; and (2) 'after-the-fact' explanation and establishment of meaning (Heiskanen and Newman, 1997: 123).

Positivism, as well as interpretive social science, provides insight into the nexus of theory and practice. In positivism the application of theory subscribes to predictive control, i.e. the ICT specialist's theoretical work informs the practitioner by supplying objective information. Such technical information may comprise top-down solutions for application in specific contexts in the organisation – the practitioner receives specialised knowledge. In interpretivism, the researcher is viewed as a participant and also as an observer. Whereas 'behaviour' is described objectively in positivism, interpretive social science wants to establish what 'actions' mean within the socio-cultural context where subjects may appear. Interpretive social science does not try to explain human life causally, but to heighten and extend our understanding of the uniqueness of social life (Carr and Kemmis, 1986).

The focal point of practitioner-based IS research is the identification of IS problems in organisations, i.e. the discrepancy that exists between the practice of IS practice and the expectations associated with the practice. It is now argued that the viability of the theoretical analysis becomes clear because expectations for an (IS) practice imply some earlier assumptions and beliefs, where these anticipations are clarified and justified (Carr and Kemmis, 1986). When relationships among IS practices and beliefs (or theories) underlying them are probed, in relation to problems and quests for resolution, then a review of social beliefs, founded on the principles of critical social science, becomes possible (Demetrion, 2000). Demetrion (2000) indicates that "[p]ractitioners, who may or may not possess extensive academic training in the social sciences, need to express any ideological critique in an idiom authentic to their experience and knowledge base". IS practitioners would do this in

a different (though possibly related) idiom that implies directly that the theory is almost always moderated by the self-moderation of practice. "Unfortunately, much of the research published in academic business journals is often seen as being too theoretical and of little practical relevance to business professionals" (Myers, 2009). An active role by practitioners in the IS research domain in organisations is necessary but also requires an understanding of the real events that form the environment in which IS practices operate. The validity of IS research requires an alternative epistemological foundation that synthesises but goes beyond both the scientific-positivistic and interpretive social science paradigms (Demetrion, 2000). Transdisciplinary research goes beyond disciplinary borders (and their related research philosophies), therefore it may provide this bridging epistemological base.

Donald Schön (1930-1997) was a very influential theorist who developed reflective professional learning theoretically and practically. Central to Schön's (1983) work are the principles of reflection-in-action and reflection-on-action. Reflection requires room in the present as well as the assurance of room in the future (Smith, 1994). Reflective practice is accordingly performed in the areas of content-, process- and premise-reflection. When addressing issues in the practice of organisational settings, practitioner researchers must combine reflection and practice. According to Price (2004), there are three aims for reflecting:

- understanding one-self, one's perceptions, motives, values, feelings and attitudes. Since practitioners are able to recognise themselves, they become more receptive to recognising the varied observations of others;
- the constructions of meanings form the basis of reflective practice (although some of these may be misguided); and
- reflecting on the consequences that may follow from one's actions.

Schön (1983) centres the concept of 'reflection' to understand what professionals do in organisational settings. The experiences of (professional) practitioners are in themselves an attempt to generate new understandings or new knowledge of present knowledge (Schön, 1983: 68). IS research is a fertile ground for the practice of reflection (Pather and Remenyi, 2005). Given the reasons for the existence of reflection and the associated features of reflective practice, one may argue that they can collectively be seen as a move to foster practitioner learning and the process of change in workplaces of organisations.

Even though philosophical ideas are implicit in all research, we argue that they continue to influence research practice too and require articulation. When utilising a philosophical view (i.e. philosophical position) in research, the question that needs to be asked, is: what lies behind the methodology? According to Cresswell (2003: 5) there are three issues which are central to research design:

- What are the *knowledge assertions* made of the researcher?
- What are the *inquiry strategies* that furnish information to the procedures?
- Which *data collection and assessment methods* should be used?

A combination of these three issues of inquiry (i.e. the knowledge assertions, the inquiry strategies of inquiry and the data collection and assessment methods) make up different approaches to research – see Figure 1.
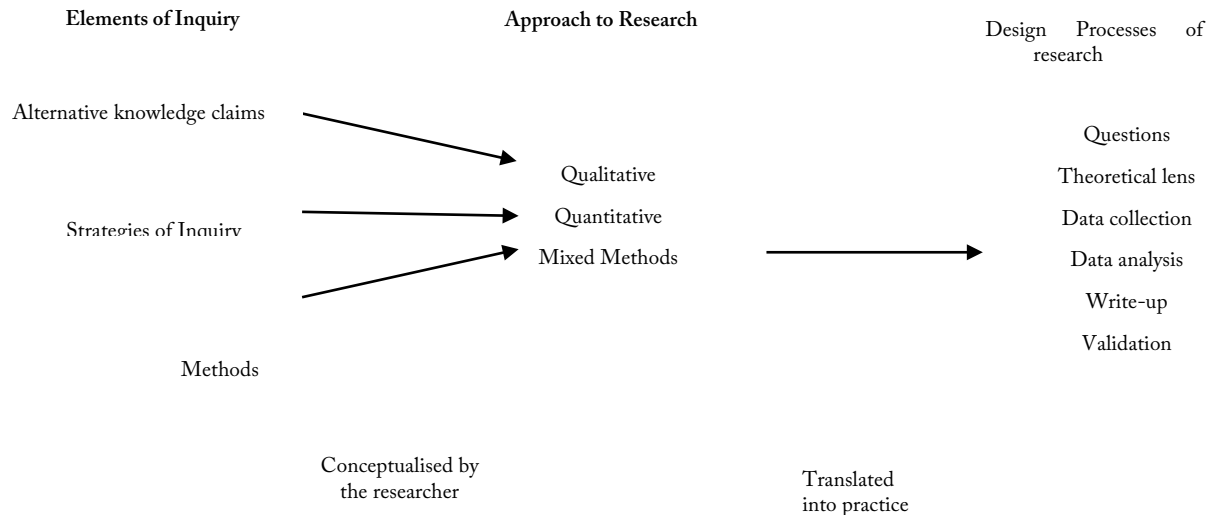
Elements of Inquiry	Approach to Research	Design Processes of research

Alternative knowledge claims → Qualitative

Questions
Theoretical lens

Strategies of Inquiry → Quantitative

Data collection

Mixed Methods →

Data analysis

Write-up

Validation

Methods

Conceptualised by the researcher

Translated into practice

Figure 1. Knowledge assertions, inquiry strategies and data collection and assessment methods and the design process (Adapted from Cresswell, 2003: 5)

Knowledge assertions

The researcher begins with perspectives about the strategies and the objects of learning during practitioner-based investigation. Cresswell (2003: 6) suggests four ways of thinking about knowledge assertions:

- Postpositivism[6] – it can be regarded as an attempt to uphold basic positivist principles in a postmodern area;
- Constructivism – dealing with the issue of reciprocal action among individuals and realising that their personal circumstances will shape their establishment of meaning;
- Advocacy – deals with promoting a research agenda for helping those individuals outside the centre of attention. The inquiry is mixed with a political agenda; and
- Pragmatism – deals with situations, actions and their consequences as opposed to antecedent states. There is a focus on effective applications and finding answers to problems.

Cresswell (2003: 12) note that when inquirers engage in research, pragmatism provides a basis for qualitative and quantitative assumptions - researchers can decide from the available procedures, techniques and methods of research that may best meet their purposes and needs. Both qualitative and quantitative research may use empirical methods (Myers, 2009), therefore empirical studies may contribute to a better understanding of how practitioners act-in-practice by considering all the aspects of the research setting.

Inquiry strategies

The strategies that are associated with mixed methods comprise a combination of field methods, *e.g.* interviews (qualitative data) and observations and surveys (quantitative data). The ICT practitioner must become involved with situations in the workplace. Since it is acknowledged that every method has its own limitations, researchers think that biased assumptions in any one method can render unfair preferences of other methods neutral.

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[6]   Generally this term is known as positivism – see research by Jackson and Søren (2007).

Data collection and assessment methods

In every approach to research, the researcher must identify data collection methods and analysis. To illustrate the point, for a mixed methods approach, Cresswell (2003: 17) proposes multiple forms of data that draws on all possibilities, questions that are open- as well as closed-ended, and analysis of statistical texts. For an approach of mixed methods, the ICT researcher usually centres activities on a matter-of-fact perspective. The inquiry strategies employed include the collection of data either sequentially or simultaneously. The collection of data relates to numeric and text information (Cresswell, 2003: 18-19).

From the discussion in subsections 6.1-6.3, the research inquiry process makes a contribution to a practitioner's way of knowing since the ICT practitioner will

- have achieved knowledge and understanding of inquiry strategies, the supporting structure of questions, the series of actions for designing an inquiry and the importance of evidence;
- have recognised how newly created knowledge can mould their professional IS practice;
- be conscious of the knowledge types that can be developed through inquiry; and
- be able to acknowledge that the reflective practitioner-based research inquiry series of actions allows the ICT practitioner to be conscious of the inquiry process at a meta-cognitive scale, i.e. in what way do they know.

Reflecting on practitioner-based research

Practitioner-based research opens up new possibilities in the ICT practitioner's workplace environment. The reflection and analysis it involves not only focuses the attention of a practitioner on aspects of 'usual' practice that are problematical in the workplace in an organisation, but also on the *deliberation* about developing and improving of practice in the workplace environment. The analysis detects and diagnoses the problems, for example in the workplace, and generates *action–hypotheses* which could be used as a basis for future experimentation (Dahlstrom, Kasokonya, Nyambe, Pomuti and Shilamba, 1997). According to Myers (2009), qualitative research may ensure a good balance between rigour and relevance in this type of inquiry. Inquiry based on practice and reflective study has a facet of deliberation and is geared to the future (Elliot, 1997). Practice-based inquiry is thus a central method for the ICT practitioner engaged in research in the workplace environment. The generation of knowledge is based on practice and this knowledge becomes integrated in the ICT practitioner's professional research strategies. Professional knowledge created is sourced from a methodical accumulation of facts and data from the practitioner's workplace environment – it is cultivated from systematic forms of practitioner inquiry.

ICT practitioners' engagement in practitioner-based research can contribute to their professional knowledge and a conception of learning theory. However, it is acknowledged that the association between theory and professional practice are somewhat multifaceted. Another component of ICT practitioner-based research is that the inquiry and outcomes can provide a direct link to the notion of 'reflective practice' and meta-cognitive process - but it is argued that ICT practitioner-based research and reflective practice are not the same. We argue that ICT practitioner-based research is distinguished (from reflective practice) by a deliberate, systematic and planned attempt to solve a particular workplace problem (or collective problems) in an ICT practitioner's workplace environment. We contend that the

assumption that reflection invariably leads to enhanced practice is significantly under-theorised; it is often taken for granted that all ICT practitioners can simply engage in reflection on their performance in (for example) the workplace environment and thus improve it. Two issues require further exploration:

- How can an ICT practitioner evaluate his own performance without feedback?
- How effective is reflection without any 'evidence' from practice in the workplace environment?

Perhaps future collaborative practitioner-based research can provide both feedback and evidence as well as the opportunity to engage in shared reflection which leads to changes in practice in the workplace environment.

Concluding remarks

There is a clear distinction between academia and industry (Tilley and Huang, 2006: 42). Each occupies a role in the entwinement of information exchange connecting the two (Huang, Scott and Zhou, 2003). Since the issues that are identified originate from the views of ICT researchers, interpretive IS can be viewed as a valid form of IS research. In essence practitioner-based research is related to problems that are identified by ICT practitioners – it "keeps their appropriation of critical social science grounded within the dynamics of issues defined at the [IS] field level rather than by the canons of academic theory" (Demetrion, 2000).

The central point for ICT practitioner-based research is therefore recognising IS problems as viewed by ICT practitioners. Effective participation by ICT practitioners in the IS research field is a requirement in the workplace environment and also for registered professional members of the CSSA since both involve an analysed situation in which IS practices function. The validity of practitioner-based research requires an epistemological base to heal the chasms between this type of research and theoretical research, as well as between the research philosophies of positivism and interpretivism. Transdisciplinary research provides the bridge through critical reflection and considered action.

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