Title	Changing with the times: Using action research to introduce ICT in classroom teaching
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CHANGING WITH THE TIMES: USING ACTION RESEARCH TO INTRODUCE ICT IN CLASSROOM TEACHING

Review by Cameron Richards

INTRODUCTION

"To change and to change for the better are two different things"
- German proverb

Teachers across the curriculum are increasingly expected to integrate Information and Communication Technologies (ICT) into their classroom practice. Yet, for various reasons, many find it hard to respond to these new demands. Many teachers feel intimidated, not only by computers and new cutting-edge internet and multimedia programs, but also by the 'top-down' pressures of new policy. There are 'bottom-up' pressures, too, in the challenges from ICT-savvy students who are more easily distracted from curriculum learning (Smith & Curtin, 1997). Many teachers do not have the time to attend ICT staff development courses, or to explore new programs or applications and their possible use in their own specific teaching contexts. In short, many teachers feel alone and generally inadequate to the task of meeting the challenges expected by administration, parents, students and the media.

Responding to policy imperatives, educational institutions commonly mount in-service training workshops for teachers. However, the one-day workshop model of ICT staff development has been criticized for not providing a sufficient context for changing practice (Abbot, Walton, Tapia & Greenwood, 1999). Not only that, but the various models of ICT learning theory tend to assume a linear progression and fail to acknowledge or cater for the transformative 'jump' required of trainees - from fearful and insecure novice to confident and applied user of ICT in teacher practice. This 'missing link' between *thinking* and *doing* (and not just between theory and practice) is made more difficult by the inherent frustrations and difficulties typically associated with the actual use of ICT (e.g. Hodas, 1993; Oppenheimer, 1997; Healy, 1998). Yet aside from the institutional, public and media imperatives for ICT integration in education (e.g. Singapore IT Masterplan for Schools), the exciting and productive possibilities of ICT for teaching provide good justification and motivation for overcoming obstacles.

ICT is not just a set of skills or tools but represents a focus of new (e.g. multimedia and internet) literacies grounded in social and cultural contexts of communication and information as much as speaking, writing, and print publication (Richards, 2000). ICT represents a new form of literacy across-the-curriculum (Kress, 1997), involves

new skills or applications for communication, information access, and interactive learning, and is now the focus of associated new learner-centered approaches to education (Jonassen, D. Peck, K. & Wilson, B., 1999).

What is needed is a methodology or strategy that can help teachers meet the challenges of change in a reflective, gradual and experimental way. One such model exists in the notion of Action Research, and in this paper I want to argue that action research can provide an important key to the integration of ICT in classroom learning and teaching - indeed, for all teaching in changing times.

REVIEW

What is action research?

Action research is a strategy or methodology which stresses the need to change and improve human performance or action in relevant practical and social contexts. In recent times the dominant assumption behind action research is the construction of social knowledge through *collective* or *collaborative reflection* (Kemmis & McTaggert, 1988; Zuber Skerritt, 1991; Wadsworth, 1998). In Kemmis and McTaggert's influential definition, action research is:

> a form of collective self-reflective inquiry undertaken by participants in social situations in order to improve the rationality and justice of their own social or educational practices, as well as their understanding of these practices and the situations in which these practices are carried out (1988).

Action research is traditionally associated with Lewin's famous cycle or spiral of *plan, act, monitor, evaluate* and *amend plan.* This process model of learning and knowledge-acquisition has informed developments in instructional design, project development, quality assurance, and professional management or planning (Hatton, Knapp & Salonga, 1997). Action research is thus more than a research *methodology.* In the education field especially, it provides a model for informal teacher reflective and social or collaborative practice. This aspect of action research is reflected in such associated synonyms as *participatory or social research, action learning* and *action evaluation* (e.g. Fetterman, 1995; Wadsworth, 1998; Hughes, 2000). In this context, concepts such as 'action', 'practice', 'participation', and even 'change' all tend to be understood as *processes of collaborative or social knowledge* rather than individual or actual performance (Wadsworth, 1998).

Kemmis and McTaggert point out that action research can be directed to different ends. They distinguish three types of action research—*technical, practical*, and *emancipatory.* To some extent, however, their distinction sets up an opposition (and hierarchical relation) between thought, discussion, and social knowledge generally on one hand, and 'action' (in the sense of technical or practical performance by actual human agents) on the other. For practitioners in the field, a more interactive, concrete, and 'bottom-up' approach to action research is needed.

A second type of participatory action is associated especially with community or cultural change and with group contexts

for individual rehabilitation or empowerment, and is characterized by *reciprocal dialogue* as distinct from mere discussion or discourse. This type of research is reflected in such terms as 'action evaluation' (Fetterman, 1995), 'conflict resolution' (Rothman, 1997), and 'empowerment theory' (Herrick, 1995). Action research in this approach serves both as a research methodology and model of professional reflective practice. For this to succeed, two features are essential: *social dialogue and collaboration.*

Sohng (1987) identifies 'dialogue' as the very basis of a participatory research methodology. Dialogue, she says, requires 'the inevitable engagement of the researcher in the critical process, in the discussion of meanings and perspectives' (p.7). It informs individual reflective practice both as a preceding stage and as an ongoing context or support. For collaboration to occur—whether between academic researchers and teacher/reflective practitioners, or between 'mentors' and anyone wanting to systematically or strategically change and improve themselves—a non-hierarchical approach is needed.

The most useful aspect of the general action research model—and perhaps its key relevance to 'ICT in education' - is its recognition that the process and stages of knowledge acquisition and construction are never merely linear or hierarchical in practice, even if typically theorized as such. The action research model resembles the basic '*design-implementation- evaluation*' sequence of all learning, teaching, research (and various other notions of professional practice), but is conceived as a repeating cycle or spiral.

Figure 1. *The Action Research 'Spiral'*

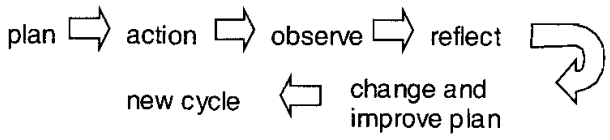


Figure 1 emphasizes how learning and knowledge might be represented as perpetual processes of 'change and improvement' insofar as: (a) human perfection and absolute truth or knowledge may not be realistic (i.e. are impossible) goals *per se*, but might still serve to inspire, encourage and exemplify goals of change and improvement; and (b) both social knowledge and individual performance are ever context-dependent and intrinsically open to change. A non-hierarchical model of objectives and domains emphasizes the complementary aspects and progressive stages of learning and knowledge grounded in 'hands-on' practice and specific contexts of application. Human ideas as well as practical tools and technical programs need to be refined or developed on the basis of actual 'testing' and performance (i.e. *Does it work*? And, if so, *How well does it work*? in terms of our needs or desires). Thus the concept of the feedback spiral (e.g. Kallick & Wilson, 2001) describes the process by which the action research spiral reconciles and connects 'top-down' theory, thinking and discussion, and 'bottom-up' practice or action in terms of 'change and improvement' initiated, encouraged and transformed by human agency.

Nowhere is the relation between attitudinal and applied skills or knowledge development more obviously crucial than in relation to the challenge

of ICT integration in education. Whether or not a particular educational technology program, method, or approach is effective for an individual teacher or in a specific context will be highly dependent not only on the attitudes and experience of that teacher and the students, but also on the extent to which they frame implementation in an integrated or 'add-on' way.

The model of action research most relevant for our educational purposes generally, and ICT integration in education in particular, is one which frames and encourages 'change and improvement' directly in terms of the relation between abstract ideas and actual practice. As Whitehead (2000) suggests, an action research model that is grounded in actual practice should begin with the participant-observer question, *How do I improve my practice?* In the dialogic model of action research this notion is extended to include groups asking the question, *How do WE improve our practices?* In terms of educational research it should also be extended to include formal research partnerships between academic researchers and teacher practitioners on one hand, and the teacher-student interaction or classroom learning environment. In this way, a research *design* organized around relevant focus questions will provide a relevant framework for individual and collective *self-evaluation* on one hand, and also *evaluation* in the more objective senses of the term as well.

Dick (1998) makes a connection between action research design and evaluation in terms of the emergent function of 'vision'. This adaptation of a systems model usefully recognizes how an initial design 'vision' can and should sustain a practical process of activities providing the feedback focus for progressive performance and outcomes evaluation. It also distinguishes between distant and unachievable ideals — that inadvertently serve to reinforce human passivity — and realizable goals, which invite action and improvement. As Dick also points out, the crucial connection between action and critical reflection in what he calls 'emergent' (i.e. dialogical) action research also informs the stages of a basic learning cycle (p.3). The well-researched and oft-discussed 'technophobia' of teachers is perhaps ultimately a failure of action reinforced by various sources of fear, resistance, and habit: the intimidating ability of younger students to embrace ICT more readily and confidently; a resentment of top-down policy and administration imperatives; and a general fear of change, newness and the unknown. Many teachers who do ostensibly embrace ICT set up a perpetual cycle of unrealistic expectation and subsequent disappointment by viewing the latest new technology as a potential 'magic bullet' which will result in overnight integration without them having to really do much—to progressively engage with and effectively practice the new ICT literacies.

DISCUSSION

Why action research is useful, and perhaps even crucial, for ICT integration in education

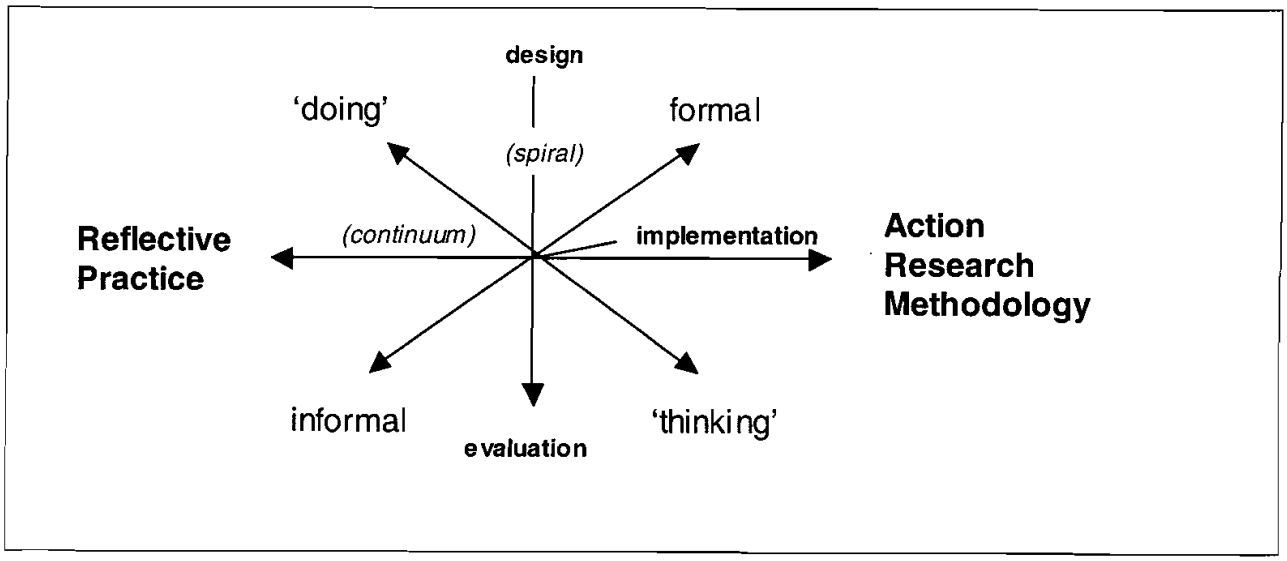
The relevance of action research for education in 'changing times' has been introduced above in terms of addressing the challenge of ICT integration as a convergent 'missing link' between

thinking (or talking) and doing. *Figure 2* below outlines how action research as a *'formal' research methodology* on one hand, and a more *informal model and context of professional reflective practice* on the other, reflect the complementary poles of an interactive continuum between 'informal doing' and 'formal thinking'. In this context, the *design-implementation-evaluation* stages of research are seen as a transformative and open-ended *spiral* rather than a linear process. In other words, in qualitative research where human agents are concerned, a research focus on 'change and improvement' precedes as well as complements the evaluation emphasis that characterizes quantitative research.

researchers are inevitably interpreters and not just observers of the world.

An action research rationale of 'change and improvement' provides a way of connecting individual action with social knowledge (i.e. doing and thinking) as a transformative progression, and overcoming various senses of 'passivity' brought about either through not responding to challenges, or through failing to recognize how even the process of observation transforms that which is observed (as well as the observer). The condition of 'passivity' also may reflect an inability to switch appropriately between modes of observation and participation.

Figure 2. *The Action Research Continuum*



The action research model thus provides a means of going beyond — and reframing in terms of human - 'action' and applied or professional practice — the fundamental two questions of all research: first, *does it make a difference?*; second, *so what?* Like other qualitative approaches to research, the 'action research' model provides a reminder to those carrying out so-called 'objective', quantitative research studies that human

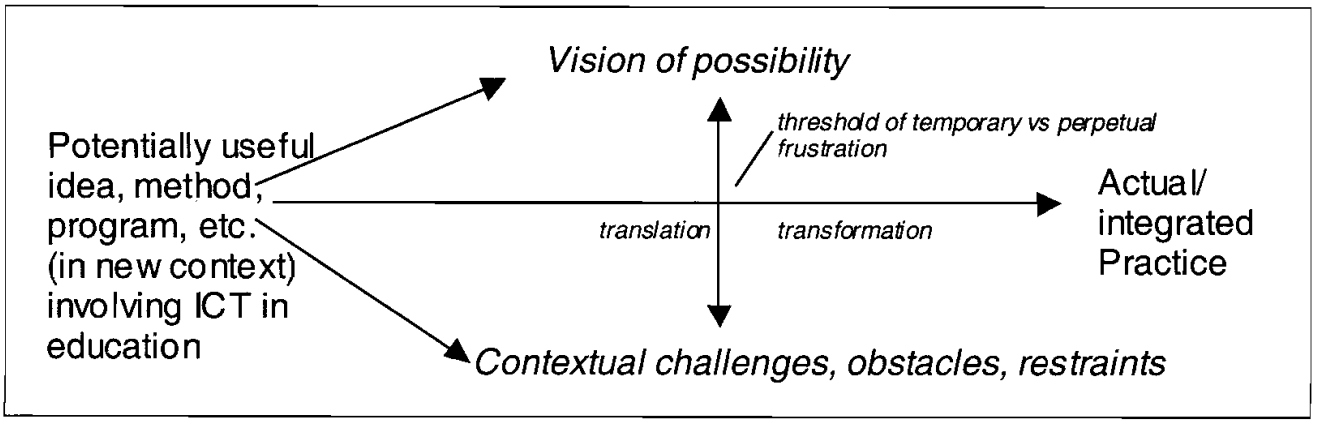
Reasoning by reflection or through discussion with others is not sufficient when people actually have to respond to new challenges in order to develop changed and improved habits and practices. ICT represents an inevitable source of frustration because of the constant need to learn new programs or functions and apply these to different contexts or situations, and learners may

need to be guided or even provoked into transforming their practices — especially when negotiating the inevitable but temporary 'threshold of frustration' associated with the applied use of ICT technologies (Bhattacharya & Richards, 2001; Richards & Bhattacharya, 2001). 'Visions of possibility' will need to be sustained as teachers and learners alike negotiate the inevitable frustrations of obstacles and challenges when attempting to integrate ICT in teaching or learning. Vision is thus tied up with an understanding, commitment, or even contract involving some degree of trust between a teacher and student that a course design is strategically conceived and will eventually deliver or scaffold learning outcomes, ultimately encourage student achievement, and justify the initial stress and worry about loss of certainty or control as learners move outside their 'comfort zone'.

The challenge of ICT integrations thus exemplifies the challenge of leaving *the known* to engage in *the unknown,* and the need to develop 'open-mindedness', various generic skills of knowledge engagement, and flexible or adaptable attitudes. As Donald Schon (1987) has put it in another context: "the experience of the students in any reflective practicum is that *they must plunge into the doing*, and try to educate themselves before they know what it is they're trying to learn" (p.12) [our emphasis].

Innovative educational action research may include the conception and trial of a new idea, method or learning tool — or the application of an existing idea, method or tool in a new context. Creative innovation may be expressed or represented in the unique performance or re-working of any everyday activity context, and not just the construction of an original form or unique product. When projected in the imagination or demonstrated in ideal conditions, an idea, method or tool can seem to work perfectly and even be a potential panacea or means of instant change and improvement. But in educational practice especially, new or borrowed ideas, methods, and tools often disappoint hopeful expectations and fail to translate into the specific contextual realities. Sometimes this is because educators like others get caught up in a perpetual cycle of hope and disappointment - projecting unrealistic expectations on every latest new cutting-edge technological innovation. Other times it may be a case

Figure 3. *Innovative vision, ICT integration, and the transformation of learning/ teaching practice through action research*



that the challenges, obstacles, and restraints faced are underestimated. The inevitable frustrations of contending with both anticipated and unexpected problems and restraints will test anyone's view of and commitment to an educational 'vision of possibility'.

A key challenge for action research evaluation is to be able to determine whether an idea, method or tool in practice has failed because of an initially unrealistic or overly-ambitious design or vision of possibility, or because of an inability to effectively connect theory/reflection and practice (thinking and doing, etc). Action research recognizes that the process of activity, performance and application is just as important (if not more so) as measurable outcomes or finished products in terms of gauging and recognizing effective learning and reflective practice. A failure to try to engage with the challenge of doing is ultimately a failure to connect thought and action, rather than a failure to learn or to integrate an idea, method or tool.

If action research is to connect effectively to practice it needs to ask some version of the following question as its design focus: *If this should work (or has worked elsewhere), what do I need to do to make it work in my current situation?* Or alternatively: *How can I change or improve my practice to give this idea, method or tool a chance to work?* (Richards & Philips-Ryan, 1999). This can suggest how action research focus questions might be just as relevant for professional practice as they are for designing, implementing, and evaluating formal research — especially where ICT integration is concerned.

Figure 4. *Convergent focus questions for research and professional practice*

Approach	Generic focus question
Research generally	*Does it make a difference? (Or, so what?)*
Action research	*How do I/we change and improve my/our practice?*
Action research and ICT use or integration	*How can I/we change or improve my/our practice to give this idea, program or tool a chance to work? If this should work (or has worked elsewhere), what do we need to do to make it work in our current situation?*

CONCLUSION

The central idea of this paper has been that the challenge of ICT integration in the classroom provides a very good, perhaps even crucial reason for embracing and promoting the relevance of action research in education generally — both as a model of professional reflective and collaborative practice on one hand, and as a qualitative research methodology on the other. Instead of perpetually 'reinventing the wheel' in inevitably ad hoc contexts, teachers might more strategically work together to reflect upon and respond to the

challenge of integrating ICT in their practice. Likewise, research about educational technology might also be framed in ways that are much more relevant to actual teaching and learning contexts in terms of the personal and social needs and requirements of teachers for effective integration. What educators need most is a strategy or approach which provides a framework where ICT in education is concerned for encouraging more effective connections between: (a) *thinking* or *talking* and *doing*; and (b) *conventional (or social) knowledge* and *personal knowledge*. In short, there is a need for both an educational *research methodology* and a model of *professional reflective practice* that recognizes the inherently problematic processes and transformative aspects of developing applied knowledge as either workable ideas or products. To the extent it fits the bill, action research is thus a useful concept for any teacher, educator, or researcher interested in changing with the times.

The challenge of integrating new Information and Communication Technologies has provided an exemplary focus for appreciating how new ideas, methods or tools need to be tested, investigated, and integrated in terms of 'visions of possibility', that are sustained in the face of both anticipated and unexpected obstacles and restraints. The process of *design, implementation*, and *evaluation,* understood as an action research spiral in related senses, thus offers an appropriate strategy and framework for change and improvement in electronic-age education, and a basis for personal, collaborative, and professional transformation.

IMPLICATIONS

- The challenge of integrating ICT in the classroom provides a very good opportunity to carry out action research — both as professional reflective and collaborative practice and as a qualitative research study. Action research model enables connections between: (a) *thinking* or *talking* and *doing*; and (b) between *conventional (or social) knowledge* and *personal knowledge*.

- Action research is a potent model for teachers, educators, or researchers interested in changing with the times. In an action research context, practitioners can work together more strategically to reflect on and respond to the new challenges involved in incorporating ICT into their teaching.

- Action research is as interested in the process of change as it is in the results. The advantage of the action research model is that it acknowledges that the processes of developing applied knowledge as either workable ideas or products are problematic.

- Perhaps all teachers should be action researchers in changing times — in the sense of reflective practice at least, and especially in terms of integrating ICT in education.

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