

# An Overview of the Methodological Approach of Action Research

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## Table of Contents

### [Introduction](#)

### [What is Action Research?](#)

#### [Definition](#)

#### [The Action Research Process](#)

#### [Principles of Action Research](#)

#### [When is Action Research used?](#)

#### [Situating Action Research in a Research Paradigm](#)

##### [Positivist Paradigm](#)

##### [Interpretive Paradigm](#)

##### [Paradigm of Praxis](#)

### [Evolution of Action Research](#)

#### [Origins in late 1940s](#)

#### [Current Types of Action Research](#)

##### [Traditional Action Research](#)

##### [Contextual Action Research \(Action Learning\)](#)

##### [Radical Action Research](#)

##### [Educational Action Research](#)

### [Action Research Tools](#)

#### [The Search Conference](#)

### [Role of the Action Researcher](#)

### [Ethical Considerations](#)

### [Examples of Action Research Projects](#)

#### [Case Study 1 - Development of nature tourism in the Windward Islands](#)

##### [Action Research and Information Technology](#)

[Case Study 2 - Internet-based collaborative work groups in community health](#)

[Case Study 3 - Computer conferencing in a learning community](#)

[Commentary on the need for more research](#)

[Conclusion](#)

## Introduction

“If you want it done right, you may as well do it yourself.” This aphorism may seem appropriate if you are a picky housekeeper, but more and more people are beginning to realize it can also apply to large corporations, community development projects, and even national governments. Such entities exist increasingly in an interdependent world, and are relying on Action Research as a means of coming to grips with their constantly changing and turbulent environments.

This paper will answer the question “What is Action Research?”, giving an overview of its processes and principles, stating when it is appropriate to use, and situating it within a praxis research paradigm. The evolution of the approach will be described, including the various kinds of action research being used today. The role of the action researcher will be briefly mentioned, and some ethical considerations discussed. The tools of the action researcher, particularly that of the use of search conferences, will be explained. Finally three case studies will be briefly described, two of which pertain to action research projects involving information technology, a promising area needing further research.

## What is Action Research?

### *Definition*

Action research is known by many other names, including participatory research, collaborative inquiry, emancipatory research, action learning, and contextural action research, but all are variations on a theme. Put simply, action research is “learning by doing” - a group of people identify a problem, do something to resolve it, see how successful their efforts were, and if not satisfied, try again. While this is the essence of the approach, there are other key attributes of action research that differentiate it from common problem-solving activities that we all engage in every day. A more succinct definition is,

"Action research...aims to contribute both to the practical concerns of people in an immediate problematic situation and to further the goals of social science simultaneously. Thus, there is a dual commitment in action research to study a system and concurrently to collaborate with members of the system in changing it in what is together regarded as a desirable direction. Accomplishing this twin goal requires the active collaboration of researcher and client, and thus it stresses the importance of co-learning as a primary aspect of the research process."<sup>[1]</sup>

What separates this type of research from general professional practices, consulting, or daily problem-solving is the emphasis on scientific study, which is to say the researcher studies the problem systematically and ensures the intervention is informed by theoretical considerations. Much of the researcher’s time is spent on refining the methodological tools to suit the exigencies of the situation, and on collecting, analyzing, and presenting data on an ongoing, cyclical basis.

Several attributes separate action research from other types of research. Primary is its focus on turning the people involved into researchers, too - people learn best, and more willingly apply what they have learned, when they do it themselves. It also has a social dimension - the research takes place in real-world situations, and aims to solve real problems. Finally, the initiating researcher, unlike in other disciplines, makes no attempt to remain objective, but openly acknowledges their bias to the other participants.

### *The Action Research Process*

Stephen Kemmis has developed a simple model of the cyclical nature of the typical action research process (Figure 1). Each cycle has four steps: plan, act, observe, reflect.

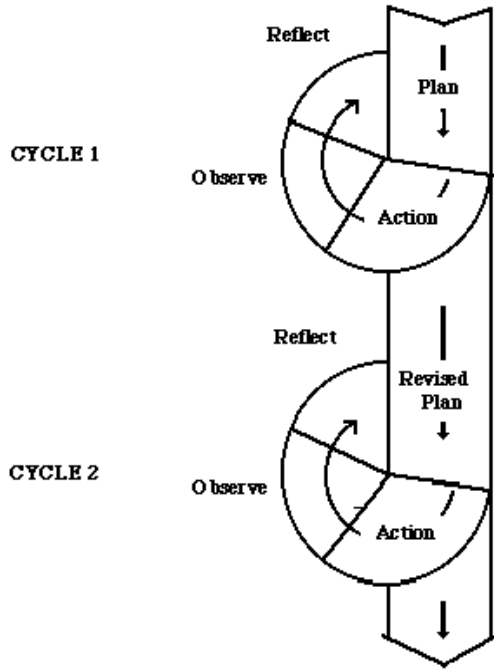


Figure 1 Simple Action Research Model  
(from MacIsaac, 1995)<sup>[ii]</sup>

Gerald Susman (1983) gives a somewhat more elaborate listing. He distinguishes five phases to be conducted within each research cycle (Figure 2). Initially, a problem is identified and data is collected for a more detailed diagnosis. This is followed by a collective postulation of several possible solutions, from which a single plan of action emerges and is implemented. Data on the results of the intervention are collected and analyzed, and the findings are interpreted in light of how successful the action has been. At this point, the problem is re-assessed and the process begins another cycle. This process continues until the problem is resolved.

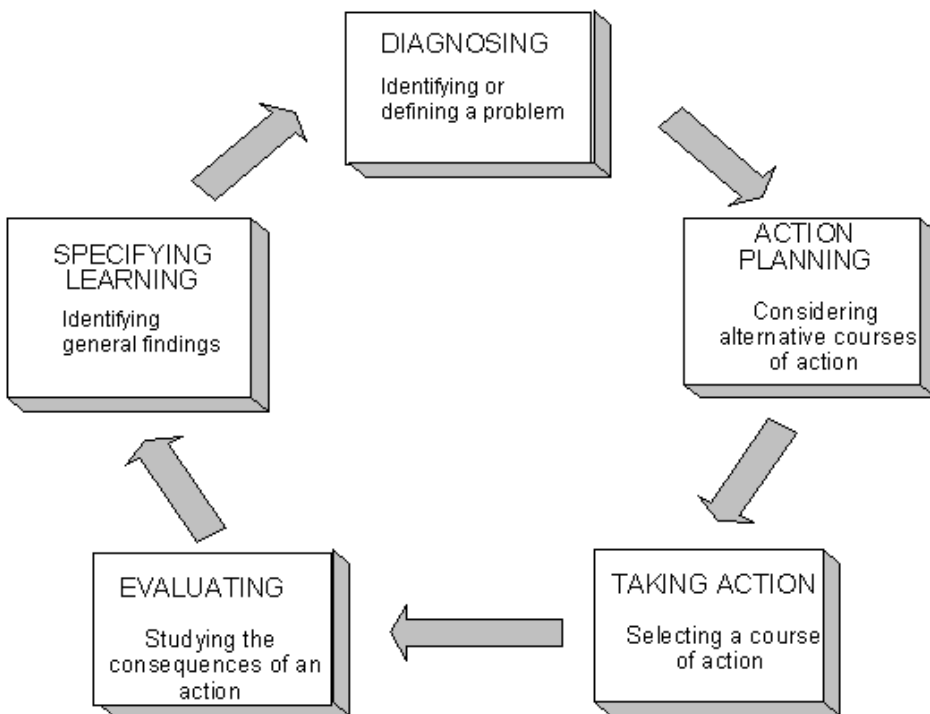


Figure 2 Detailed Action Research Model  
(adapted from Susman 1983)<sup>[iii]</sup>

**Principles of Action Research**

What gives action research its unique flavour is the set of principles that guide the research. Winter (1989) provides a comprehensive overview of six key principles. [\[iv\]](#)

### 1) *Reflexive critique*

An account of a situation, such as notes, transcripts or official documents, will make implicit claims to be authoritative, i.e., it implies that it is factual and true. Truth in a social setting, however, is relative to the teller. The principle of reflective critique ensures people reflect on issues and processes and make explicit the interpretations, biases, assumptions and concerns upon which judgments are made. In this way, practical accounts can give rise to theoretical considerations.

### 2) *Dialectical critique*

Reality, particularly social reality, is consensually validated, which is to say it is shared through language. Phenomena are conceptualized in dialogue, therefore a dialectical critique is required to understand the set of relationships both between the phenomenon and its context, and between the elements constituting the phenomenon. The key elements to focus attention on are those constituent elements that are unstable, or in opposition to one another. These are the ones that are most likely to create changes.

### 3) *Collaborative Resource*

Participants in an action research project are co-researchers. The principle of collaborative resource presupposes that each person's ideas are equally significant as potential resources for creating interpretive categories of analysis, negotiated among the participants. It strives to avoid the skewing of credibility stemming from the prior status of an idea-holder. It especially makes possible the insights gleaned from noting the contradictions both between many viewpoints and within a single viewpoint

### 4) *Risk*

The change process potentially threatens all previously established ways of doing things, thus creating psychic fears among the practitioners. One of the more prominent fears comes from the risk to ego stemming from open discussion of one's interpretations, ideas, and judgments. Initiators of action research will use this principle to allay others' fears and invite participation by pointing out that they, too, will be subject to the same process, and that whatever the outcome, learning will take place.

### 5) *Plural Structure*

The nature of the research embodies a multiplicity of views, commentaries and critiques, leading to multiple possible actions and interpretations. This plural structure of inquiry requires a plural text for reporting. This means that there will be many accounts made explicit, with commentaries on their contradictions, and a range of options for action presented. A report, therefore, acts as a support for ongoing discussion among collaborators, rather than a final conclusion of fact.

### 6) *Theory, Practice, Transformation*

For action researchers, theory informs practice, practice refines theory, in a continuous transformation. In any setting, people's actions are based on implicitly held assumptions, theories and hypotheses, and with every observed result, theoretical knowledge is enhanced. The two are intertwined aspects of a single change process. It is up to the researchers to make explicit the theoretical justifications for the actions, and to question the bases of those justifications. The ensuing practical applications that follow are subjected to further analysis, in a transformative cycle that continuously alternates emphasis between theory and practice.

## **When is Action Research used?**

Action research is used in real situations, rather than in contrived, experimental studies, since its primary focus is on solving real problems. It can, however, be used by social scientists for preliminary or pilot research, especially when the situation is too ambiguous to frame a precise research question. Mostly, though, in accordance with its principles, it is chosen when circumstances require flexibility, the involvement of the people in the research, or change must take place quickly or holistically.

It is often the case that those who apply this approach are practitioners who wish to improve understanding of their practice, social change activists trying to mount an action campaign, or, more likely, academics who have been invited into an organization (or other domain) by decision-makers aware of a problem requiring action research, but lacking the requisite methodological knowledge to deal with it.

## ***Situating Action Research in a Research Paradigm***

### **Positivist Paradigm**

The main research paradigm for the past several centuries has been that of Logical Positivism. This paradigm is based on a number of principles, including: a belief in an objective reality, knowledge of which is only gained from sense data that can be directly experienced and verified between independent observers. Phenomena are subject to natural laws that humans discover in a logical manner through empirical testing, using inductive and deductive hypotheses derived from a body of scientific theory. Its methods rely heavily on quantitative measures, with relationships among variables commonly shown by mathematical means. Positivism, used in scientific and applied research, has been considered by many to be the antithesis of the principles of action research (Susman and Evered 1978, Winter 1989).

### **Interpretive Paradigm**

Over the last half century, a new research paradigm has emerged in the social sciences to break out of the constraints imposed by positivism. With its emphasis on the relationship between socially-engendered concept formation and language, it can be referred to as the Interpretive paradigm. Containing such qualitative methodological approaches as phenomenology, ethnography, and hermeneutics, it is characterized by a belief in a socially constructed, subjectively-based reality, one that is influenced by culture and history. Nonetheless it still retains the ideals of researcher objectivity, and researcher as passive collector and expert interpreter of data.

### **Paradigm of Praxis**

Though sharing a number of perspectives with the interpretive paradigm, and making considerable use of its related qualitative methodologies, there are some researchers who feel that neither it nor the positivist paradigms are sufficient epistemological structures under which to place action research (Lather 1986, Morley 1991). Rather, a paradigm of Praxis is seen as where the main affinities lie. Praxis, a term used by Aristotle, is the art of acting upon the conditions one faces in order to change them. It deals with the disciplines and activities predominant in the ethical and political lives of people. Aristotle contrasted this with Theoria - those sciences and activities that are concerned with knowing for its own sake. Both are equally needed he thought. That knowledge is derived from practice, and practice informed by knowledge, in an ongoing process, is a cornerstone of action research. Action researchers also reject the notion of researcher neutrality, understanding that the most active researcher is often one who has most at stake in resolving a problematic situation.

## **Evolution of Action Research**

### ***Origins in late 1940s***

Kurt Lewin is generally considered the ‘father’ of action research. A German social and experimental psychologist, and one of the founders of the Gestalt school, he was concerned with social problems, and focused on participative group processes for addressing conflict, crises, and change, generally within organizations. Initially, he was associated with the Center for Group Dynamics at MIT in Boston, but soon went on to establish his own National Training Laboratories.

Lewin first coined the term ‘action research’ in his 1946 paper “Action Research and Minority Problems”, [\[v\]](#) characterizing Action Research as “a comparative research on the conditions and effects of various forms of social action and research leading to social action”, using a process of “a spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action”.

Eric Trist, another major contributor to the field from that immediate post-war era, was a social psychiatrist whose group at the Tavistock Institute of Human Relations in London engaged in applied social research, initially for the civil repatriation of German prisoners of war. He and his colleagues tended to focus more on large-scale, multi-organizational problems.

Both Lewin and Trist applied their research to systemic change in and between organizations. They emphasized direct professional - client collaboration and affirmed the role of group relations as basis for problem-solving. Both were avid proponents of the principle that decisions are best implemented by those who help make them.

## **Current Types of Action Research**

By the mid-1970s, the field had evolved, revealing 4 main 'streams' that had emerged: traditional, contextural (action learning), radical, and educational action research.

### **Traditional Action Research**

Traditional Action Research stemmed from Lewin's work within organizations and encompasses the concepts and practices of Field Theory, Group Dynamics, T-Groups, and the Clinical Model. The growing importance of labour-management relations led to the application of action research in the areas of Organization Development, Quality of Working Life (QWL), Socio-technical systems (e.g., Information Systems), and Organizational Democracy. This traditional approach tends toward the conservative, generally maintaining the status quo with regards to organizational power structures.

### **Contextural Action Research (Action Learning)**

Contextural Action Research, also sometimes referred to as Action Learning, is an approach derived from Trist's work on relations between organizations. It is contextural, insofar as it entails reconstituting the structural relations among actors in a social environment; domain-based, in that it tries to involve all affected parties and stakeholders; holographic, as each participant understands the working of the whole; and it stresses that participants act as project designers and co-researchers. The concept of organizational ecology, and the use of search conferences come out of contextural action research, which is more of a liberal philosophy, with social transformation occurring by consensus and normative incrementalism.

### **Radical Action Research**

The Radical stream, which has its roots in Marxian 'dialectical materialism' and the praxis orientations of Antonio Gramsci, has a strong focus on emancipation and the overcoming of power imbalances. Participatory Action Research, often found in liberationist movements and international development circles, and Feminist Action Research both strive for social transformation via an advocacy process to strengthen peripheral groups in society.

### **Educational Action Research**

A fourth stream, that of Educational Action Research, has its foundations in the writings of John Dewey, the great American educational philosopher of the 1920s and 30s, who believed that professional educators should become involved in community problem-solving. Its practitioners, not surprisingly, operate mainly out of educational institutions, and focus on development of curriculum, professional development, and applying learning in a social context. It is often the case that university-based action researchers work with primary and secondary school teachers and students on community projects.

## **Action Research Tools**

Action Research is more of a holistic approach to problem-solving, rather than a single method for collecting and analyzing data. Thus, it allows for several different research tools to be used as the project is conducted. These various methods, which are generally common to the qualitative research paradigm, include: keeping a research journal, document collection and analysis, participant observation recordings, questionnaire surveys, structured and unstructured interviews, and case studies.

### **The Search Conference**

Of all of the tools utilized by action researchers, the one that has been developed exclusively to suit the needs of the action research approach is that of the search conference, initially developed by Eric Trist and Fred Emery at the Tavistock Institute in 1959, and first implemented for the merger of Bristol-Siddley Aircraft Engines in 1960.

The search conference format has seen widespread development since that time, with variations on Trist and Emery's theme becoming known under other names due to their promotion by individual academics and consultants. These include

Dannemiller-Tyson's Interactive Strategic Planning, Marvin Weisbord's Future Search Conference, Dick Axelrod's Conference Model Redesign, Harrison Owen's Open Space, and ICA's Strategic Planning (Rouda 1995).

Search conferences also have been conducted for many different circumstances and participants, including: decision-makers from several countries visioning the "Future of Participative Democracy in the Americas";<sup>[vi]</sup> practitioners and policymakers in the field of health promotion in Ontario taking charge in an era of cutbacks;<sup>[vii]</sup> and Xerox employees sorting out enterprise re-organization.<sup>[viii]</sup>

Eric Trist sums up the process quite nicely -

"Searching...is carried out in groups which are composed of the relevant stakeholders. The group meets under social island conditions for 2-3 days, sometimes as long as five. The opening sessions are concerned with elucidating the factors operating in the wider contextual environment - those producing the meta-problems and likely to affect the future. The content is contributed entirely by the members. The staff are facilitators only. Items are listed in the first instance without criticism in the plenary session and displayed on flip charts which surround the room. The material is discussed in greater depth in small groups and the composite picture checked out in plenary. The group next examines its own organizational setting or settings against this wider background and then proceeds to construct a picture of a desirable future. It is surprising how much agreement there often is. Only when all this has been done is consideration given to action steps..."<sup>[ix]</sup>

Figure 3 provides a schematic of a typical search conference.

<i>Pre-conference process</i>	<ul style="list-style-type: none"> <li>· set up Advisory Group of local representatives</li> <li>· agree on process design and participants</li> <li>· use focus groups for preparation</li> <li>· invitations, distribution of introductory materials</li> </ul>
<i>Introductory plenary</i>	introductions, review objectives, outline process, introduce first stage
<i>Small group session 1</i>	SCANNING THE ISSUE <ul style="list-style-type: none"> <li>· past and present context</li> <li>· assess current situation</li> <li>· outline probable futures</li> </ul>
<i>Presentation plenary</i>	reports from small groups, discuss directions, introduce second stage
<i>Small group session 2</i>	DESIRED FUTURES <ul style="list-style-type: none"> <li>· long-range visions</li> <li>· alternative / preferred futures</li> </ul>
<i>Presentation plenary</i>	reports, review progress, introduction to third stage
<i>Small group session 3</i>	OPTIONS FOR CHANGE <ul style="list-style-type: none"> <li>· constraints and opportunities</li> <li>· possible futures</li> </ul>
<i>Presentation plenary</i>	reports, define strategic tasks / actions, select key tasks, form task groups
<i>Task Group sessions</i>	TASK GROUP MEETINGS
<i>Final plenary</i>	Task Group reports, discuss future contacts, create new Advisory Group
<i>Post-conference process</i>	<ul style="list-style-type: none"> <li>· report distributed</li> <li>· follow-up contacts</li> <li>· Advisory Group facilitates meetings of Task Groups</li> <li>· feedback on proposed actions</li> <li>· further search conferences</li> <li>· widen network</li> <li>· continuing evaluation of outcomes</li> </ul>

Figure 3 - Search Conference  
(adapted from The ABL Group, 1997)<sup>[x]</sup>

## Role of the Action Researcher

Upon invitation into a domain, the outside researcher's role is to implement the Action Research method in such a manner as to produce a mutually agreeable outcome for all participants, with the process being maintained by them afterwards. To accomplish this, it may necessitate the adoption of many different roles at various stages of the process, including those of

planner leader	
catalyzer	facilitator
teacher	designer
listener	observer
synthesizer	reporter

The main role, however, is to nurture local leaders to the point where they can take responsibility for the process. This point is reached they understand the methods and are able to carry on when the initiating researcher leaves.

In many Action Research situations, the hired researcher's role is primarily to take the time to facilitate dialogue and foster reflective analysis among the participants, provide them with periodic reports, and write a final report when the researcher's involvement has ended.

## Ethical Considerations

Because action research is carried out in real-world circumstances, and involves close and open communication among the people involved, the researchers must pay close attention to ethical considerations in the conduct of their work. Richard Winter (1996) lists a number of principles:

- "Make sure that the relevant persons, committees and authorities have been consulted, and that the principles guiding the work are accepted in advance by all.
- All participants must be allowed to influence the work, and the wishes of those who do not wish to participate must be respected.
- The development of the work must remain visible and open to suggestions from others.
- Permission must be obtained before making observations or examining documents produced for other purposes.
- Descriptions of others' work and points of view must be negotiated with those concerned before being published.
- The researcher must accept responsibility for maintaining confidentiality."<sup>[xi]</sup>

To this might be added several more points:

- Decisions made about the direction of the research and the probable outcomes are collective
- Researchers are explicit about the nature of the research process from the beginning, including all personal biases and interests
- There is equal access to information generated by the process for all participants
- The outside researcher and the initial design team must create a process that maximizes the opportunities for involvement of all participants.

## Examples of Action Research Projects

To better illustrate how action research can proceed, three case studies are presented. Action research projects are generally situationally unique, but there are elements in the methods that can be used by other researchers in different circumstances. The first case study, an account taken from the writings of one of the researchers involved (Franklin 1994), involves a research project to stimulate the development of nature tourism services in the Caribbean. It represents a fairly typical example of an action research initiative. The second and third case studies centre around the use of computer communications, and therefore illustrate a departure from the norm in this regard. They are presented following a brief overview of this potentially promising technical innovation.



### **Case Study 1 - Development of nature tourism in the Windward Islands**

In 1991, an action research process was initiated to explore how nature tourism could be instituted on each of the four Windward Islands in the Caribbean - St. Lucia, Grenada, Dominica, and St. Vincent. The government took the lead, for environmental conservation, community-based development, and national economic development purposes. Realizing that the consultation process had to involve many stakeholders, including representatives of several government ministries, environmental and heritage groups, community organizations, women's and youth groups, farmers' cooperatives, and private business, an action research approach was seen as appropriate.

Two action researchers from York University in Toronto, with prior experience in the region, were hired to implement the project, with a majority of the funding coming from the Canadian International Development Agency. Multi-stakeholder national advisory councils were formed, and national project coordinators selected as local project liaisons. Their first main task was to organize a search conference on each island.

The search conferences took place, the outcome of which was a set of recommendations and/or action plans for the carrying out of a number of nature tourism-oriented sub-projects at the local community level. At this point, extended advisory groups were formed on several of the islands, and national awareness activities and community sub-projects were implemented in some cases.

To maintain the process, regional project meetings were held, where project coordinators and key advisory members shared experiences, conducted self-evaluations and developed plans for maintaining the process (e.g., fundraising). One of the more valuable tools for building a sense of community was the use of a videocamera to create a documentary video of a local project.

The outcomes varied.<sup>[xii]</sup> In St. Vincent the research project was highly successful, with several viable local developments instituted. Grenada and St. Lucia showed mixed outcomes, and Dominica was the least successful, the process curtailed by the government soon after the search conference took place. The main difference in the outcomes, it was felt, was in the willingness of the key government personnel to "let go" and allow the process to be jointly controlled by all participants. There is always a risk that this kind of research will empower stakeholders, and change existing power relations, the threat of which is too much for some decision-makers, but if given the opportunity, there are many things that a collaborative group of citizens can accomplish that might not be possible otherwise.

### **Action Research and Information Technology**

In the past ten years or so, there has been a marked increase in the number of organizations that are making use of information technology and computer mediated communications. This has led to a number of convergences between information systems and action research. In some cases, it has been a matter of managers of corporate networks employing action research techniques to facilitate large-scale changes to their information systems. In others, it has been a question of community-based action research projects making use of computer communications to broaden participation.

Much of the action research carried out over the past 40 years has been conducted in local settings with the participants meeting face-to-face with "real-time" dialogue. The emergence of the Internet has led to an explosion of *asynchronous* and *aspatial* group communication in the form of e-mail and computer conferences, and recently, v-mail and video conferencing. While there have been numerous attempts to use this new technology in assisting group learning, both within organizations and among groups in the community [this author has been involved with a dozen or more projects of this kind in the nonprofit sector in Canada alone], there is a dearth of published studies on the use of action research methods in such projects. Lau and Hayward (1997), in a recent review of the literature, found that most research on group support systems to date has been in short-term, experimental situations using quantitative methods.. There are a few examples, though, of longitudinal studies in naturalistic settings using qualitative methods; of those that did use action research, none studied the use and effects of communication systems in groups and organizations.

We can now turn to the case studies, both of which are situated in an area in need of more research - that of the use of information technology as a potentially powerful adjunct to action research processes.

### **Case Study 2 - Internet-based collaborative work groups in community health**

Lau and Hayward (1997) used an action research approach in a study of their own to explore the structuration of Internet-based collaborative work groups. Over a two-year period, the researchers participated as facilitators in three action research cycles of problem-solving among approximately 15 instructors and project staff, and 25 health professionals from

various regions striving to make a transition to a more community-based health program. The aim was to explore how Internet-based communications would influence their evolution into a virtual collaborative workgroup.

The first phase was taken up with defining expectations, providing the technology and developing the customized workgroup system. Feedback from participants noted that shorter and more spaced training sessions, with instructions more focused on specific projects would have been more helpful. The next phase saw the full deployment of the system, and the main lesson learned was that the steepness of the learning curve was severely underestimated, with frustrations only minimally satisfied by a great deal of technical support provided by telephone. The final cycle saw the stabilization of the system and the emergence of the virtual groups

The researchers found that those who used the system interactively were more likely to establish projects that were collaborative in nature, and that the lack of high quality information on community healthcare online was a drawback. The participants reported learning a great deal from the initiative.

The interpretations of the study suggest that role clarity, relationship building, information sharing, resource support, and experiential learning are important aspects in virtual group development. There was also a sense that more research was needed on how group support systems can help groups interact with their external environment, as well as on how to enhance the process of learning by group members.

### ***Case Study 3 - Computer conferencing in a learning community***

Comstock and Fox (1995) have written about their experiences in integrating computer conferencing into a learning community for mid-career working adults attending a Graduate Management Program at Antioch University in Seattle. From 1992 to 1995, the researchers and their students made use of a dial-up computer conferencing system called Caucus to augment learning outside of monthly classroom weekends. Their findings relate to establishing boundaries to interaction, creating a caring community, and building collaborative learning.

Boundary setting was a matter of both defined membership, i.e., access to particular conferences, and actual participation. The architecture of the online environment was equated to that of a house, in which locked rooms allowed for privacy, but hampered interaction. They suggest some software design changes that would provide more cues and flexibility to improve access and usage.

Relationships in a caring community were fostered by caring talk, personal conversations and story telling. Over time, expressions of personal concern for other participants increased, exemplifying a more tightly-knit group. Playful conversations of a personal nature also improved group relations, as did stories of events in individuals' lives. These processes provided the support and induced the trust needed to sustain the more in-depth collaborative learning taking place.

Students were expected to use the system for collaborative learning using three forms of conversation - dialogue, discussion and critical reflection. Dialogues were enjoined as a result of attempts to relate classroom lessons to personal situations at work, with a better understanding provided by multiple opinions. Discussions, distinguished by the goal of making a group decision or taking an action, required a fair degree of moderation, insofar as participants found it difficult to reach closure. The process of reflecting critically on ideas was also difficult - participants rarely took the time to analyze postings, preferring a more immediate, and more superficial, conversational style.

The authors conclude with four recommendations: 1) be clear about the purpose of the computer conference and expectations for use; 2) develop incentives for widespread and continuous participation; 3) pay attention to affects of the software on the way the system is used for learning; and 4) teach members of the community how to translate face-to-face collaborative processes to the on-line environment.

### **Commentary on the need for more research**

The characteristics of the new information technologies, especially that of computer conferencing, which allows group communications to take place outside of the bounds of time and space, have the potential to be well suited to action research. Projects that traditionally have been limited to local, real-time interactions, such as in the case of search conferences, now have the possibility of being conducted online, with the promise of larger-sized groups, more reflexivity, greater geographic reach, and for a longer period of sustained interaction. The current state of the software architecture, though, does not seem to be sufficient to induce the focused collaboration required. Perhaps this will remain the case until cyberspace becomes as elaborate in contextual cues as our current socio-physical environment. Whatever the eventual outcome of online developments, it is certain that action research and information technologies will continue to converge, and we must be prepared to use action research techniques to better understand and utilize this convergence.

## Conclusion

This paper has presented an overview of action research as a methodological approach to solving social problems. The principles and procedures of this type of research, and epistemological underpinnings, were described, along with the evolution of the practice. Details of a search conference and other tools were given, as was an indication of the roles and ethics involved in the research. The case studies gave concrete examples of projects, particularly in the relatively new area of social deployment of information technologies. Further action research is needed to explore the potential for developing computer-mediated communications in a way that will enhance human interactions.

## Endnotes

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