Participatory Methods and Reflective Practice Applied to Research in Education for Sustainability

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Abstract

This article describes research with schoolteachers using participatory methods and reflective practice. These approaches have been used to enable teachers to establish their practice needs in relation to education for sustainability (EfS) and also maintain the integrity of their subject disciplines. The participatory methods are derived from various sources used in different contexts, but have the purpose of being empowering and democratic. The intention is to develop knowledge and action that is directly useful to the participating group through a process of collective self-enquiry, where reflection helps to focus on the learning process rather than the outcomes. The ways that these methods have been applied, their derivation from other fields of research, their strengths, as well as the problems encountered when applying them, are discussed.

Résumé

Cet article décrit la recherche effectuée auprès d'enseignants à la faveur de méthodes participatives et de pratiques réflexives. Ces approches ont été adoptées afin que les enseignants puissent délimiter leurs besoins en ce qui a trait aux pratiques employées dans l'éducation pour un avenir viable et aussi afin de leur permettre de préserver l'intégrité de leurs disciplines. Les méthodes participatives sont dérivées de plusieurs sources auxquelles on fait appel dans divers contextes. Toutefois, elles se veulent habilitantes et démocratiques dans le but d'engendrer des connaissances et des actions qui sont directement utiles au groupe participant, grâce à un processus collectif de questionnement personnel au cours duquel la réflexion permet de se concentrer sur le processus d'apprentissage plutôt que sur les résultats. Les diverses formes d'application de ces méthodes, leur dérivation d'autres domaines de recherche, leurs forces, ainsi que les problèmes rencontrés au moment de leur application sont abordés dans cet article.

The application of research methods used in very different contexts to environmental education and education for sustainability (EfS) can provide exciting new avenues for progress in our field. This article is concerned with participatory methods combined with reflective practice among teachers in schools. The discussion will focus on processes and issues of methodology, rather than giving a report on the substantive content of any particular study. There will be brief discussion of the authoritative sources from which

the methodology has been derived, the advantages of its use and ways in which it can be applied to education for sustainability with teachers or teachers on pre-service courses. This will include potential problems that need to be addressed; some of this will be illustrated with brief examples from the author's previous research. It should be appreciated that participatory approaches lend themselves particularly well to extension into various types of action research; however, these will not be considered specifically in this article. The purpose of this article is to make the case for the use of a particular type of methodology; not simply as an alternative to different approaches to research, but in order to achieve quite different ends.

The approaches described and discussed in this paper are derived principally from the work of Reason and others and relates to the nature of change and the relationship of research and practice (see below). At the outset readers should appreciate that participatory methods of research and development are not presented here as unproblematic. It is difficult to write about them without them becoming de-contextualized and therefore turned into something studied academically from the outside. In an attempt to get to the essence of this difference they have been described as "a living process of coming to know, rather than a formal academic method" (Reason, 1994, p. 325). Also Reason and Bradbury (2001) admit to not being able to provide an exhaustive review of each type of participatory method, which allows exploration of the subtleties of theory and practice. This presents difficulties for those coming to these methodologies from different research traditions who will want more formal definitions of the approaches. It is easier for those coming afresh to these methods to appreciate the ideology of the approach than the detailed description of the process.

The reason for developing and applying these participatory methodologies is that for the most part research involving practitioners, who are teachers or student teachers, is carried out by an individual who is functioning, for the time being at any rate, as an outsider to that community of teachers. Most orthodox forms of research involve surveys, questionnaires, interviews, or observations that are specifically designed to exclude the subjects from making choices on the subject matter for the research. Also, in most conventional research the researcher sets the agenda. This may be for a variety of purposes but these do not generally include directly changing the thinking and behaviour of the practitioners involved. In other words the research can be described as being "done to" rather than "done with" those who are the focus of the study.

Participatory methods linked to a cycle of reflection, and frequently action, can be an effective way of bringing about change and casting teachers in the role of co-researchers. Action research shares many of the qualities of participatory methods but often requires different levels of co-operation between researcher and the practitioners, but there is generally no doubt about whom is controlling the undertaking. Furthermore, it was appreciated that in

recent years there is an increasing tendency in many countries for innovation to be imposed on teachers (see, for example, UNESCO-ACEID, 1994) and rarely arises as part of their own agenda. The overall effect is to reduce teachers' perception of their professional status. One purpose of participatory research is to consciously redress the balance and explore ways of empowerment and provide opportunities for teachers to have some control over the development of their own professional expertise. (For further discussion of these ideas see, for example, Hayward, 1998.)

Background

Participatory approaches are becoming more commonly used in training contexts, for example in relation to international development projects (see Grieser, 2000); however, their use in research in education for sustainability is not recorded. Although we should not be too concerned with the range of the terms used to describe participatory methods of enquiry, it is necessary to offer some clarification about the nature of the field and the authoritative sources from which it is derived. A number of different workers have used participatory methods for research in different contexts, adapting it to their own use and providing different labels for what they are doing. Reason (1994) groups all of these methods within the term *co-operative inquiry*. His work has ranged widely but one example involved health professionals functioning locally in the UK as a multidisciplinary group. Other specific terms include *participatory appraisal*, used by Chambers (1992) to describe his work in agricultural extension in third world rural development. Fals-Borda (1988), working with people in third world countries to enable them to have a voice in their own social development, uses the term *participatory action research*. Aspects of these, and many more, have been borrowed by different workers as considered appropriate to the requirements of their research. However, all share a common ingredient, which relates to the participatory nature of the approach that is carried out with groups of people who have a shared interest. They draw on a particular range of skills from the researcher and a discussion of these will be an important part of this article.

The author, in a series of previously reported studies (see later), has used the methodology discussed in this article. The methodology was derived mainly from participatory appraisal (Chambers, 1992; Heron & Reason, 2001), participatory action research [PAR] (Fals-Borda & Rahman, 1991; Park, 1997), and a form of co-operative enquiry (Heron, 1992, 1996; Reason, 1988). These types of co-operative/participatory enquiry are adaptable and can be used flexibly in different contexts for professional training (Reason & Bradbury, 2001). An important purpose of all of these methods is to make participants aware of the choices available and the consequences of making their choices. The literature indicated that these approaches are likely to be successful with people,

such as teachers, who are encouraged to feel relatively empowered by the process and who wish to explore and develop their practice in a collaborative way with their peers (Reason, 1994). The reflective aspects of the approach make an essential contribution and they are based on the ideas and practice of Stenhouse (1975) and Schön (1987, 1995) in relation to teachers and teaching. Here the emphasis is on the learning processes rather than the product. Participants are encouraged to adopt a critical attitude towards the curriculum and teaching approaches, rather than straightforward acceptance. The main concern is with professional problem solving made rigorous by evaluative reflection, and where the focus is upon an epistemology of practice rather than an attempt to introduce arguments based upon academic scholarship. Shön (1995) considers that the isolated position of individual teachers within the classroom is a problem that works against the reflective process and that peer exchanges can help to overcome the difficulty.

The underlying principles of the participatory aspects of the approach are to place value on the experience of participants as practitioners, to help them to work collaboratively with colleagues and to make them feel empowered by the process. From these principles the intention is to develop knowledge and action that can be shown to be directly useful through a process of collaborative self-enquiry and reflection (Fals-Borda, 1988). It begins with the premise that practitioners know the context in which they are working and generally they have a collective fund of knowledge and practical experience with which they can solve their own problems. What they require is a suitable context in which to function in making their decisions. Furthermore the important purpose of developing "ownership" of the solutions that they create for themselves is an essential part of process. Therefore, the benefits in relation to education for sustainability are that it should enable teachers to draw from their own knowledge about sustainability and that of their colleagues and to appreciate the value of their own expertise. Within the context of this type of research they are encouraged to learn from each other and to continue the process by understanding that thinking is not enough and they need to move on to establishing an approach to practice.

The ideas behind the methodology are simple but difficult to put into practice, and however carefully the researcher applies the principles, the final achievement never seems to fully realize what was intended. Nevertheless, there is sufficient here to make the case for this being an important and somewhat innovative avenue for future research in education for sustainability. Later in this paper consideration will be given to some of the particular approaches and skills required for applying the methodology.

To illustrate some of these points, examples will be drawn from a number of cases where the author has used this methodology. These include the following enquiries:

- Working with science teachers to consider approaches to biodiversity education (Gayford, 2000);
- Developing a deeper appreciation among science and geography teachers of the pedagogical implications of education for sustainability (Gayford, 2001);
- Exploring the nature of environmental literacy and considering the implications for science teachers in their classroom practice (Gayford, 2002a);
- Developing collaboration between science teachers and their non-science teaching colleagues in relation to education for sustainability (Gayford, 2002b); and
- Exploring the contribution of science education for teaching controversial issues in relation to sustainability (Gayford, 2002c).

These cases provide the substantive, contextualized backdrop for the present reflective commentary on the process.

The various enquiries upon which this article is based set out to address the concerns mainly of science teachers and those involved with personal and social education type courses. Often the motivation arose because the science teachers felt that they lacked the time and expertise to deal with the full range of perspectives related to education for sustainability. At the same time they were often clear that they felt more confident to teach the essential knowledge and skills that are central to their subject discipline and which could contribute significantly to education for sustainability. The teachers of the personal and social education type courses considered that their expertise in the scientific aspects of education for sustainability was generally too limited and they also lacked sufficient time to provide appropriate scientific background understanding.

Most of the research on which this article is based has often been undertaken with different groups following different agendas but in parallel with other groups. Collectively the different pieces of work have taken more than five years from start to completion and overall they show an evolution and refinement of the methodology, which is reported here. Although most of them have been conducted with science teachers, the methodology should have wide application with many different types of teachers.

Considerations for the Researcher

General considerations for the researcher will be dealt with first followed by more specific examples taken from the approaches used by the author. However, the reader should be aware that the most sure beginning to successful application of these methods will be for the researcher to be a fully accepted and trusted member of the practice community in which the work will take place.

Basically the main skill required of the researcher relates to being able to work in genuine collaboration with others in the group thus treating them as far as possible as peers, which implies equality and applying democratic processes. The challenge therefore is to be able to set up a group that can work co-operatively, even though the initial ideas for content and process are those of one or two individuals. The process must make sense to all members of the group and not be seen simply as a piece of research. The skills required of the researcher often involve careful listening, helping to reconcile differences, assisting by adding clarity to what has been discussed and creating goodwill. The role of the researcher should be, as far as possible, to maintain a "low profile" and to act as a facilitator in the process rather than as a leader or expert. The research is intended to be a vehicle for enabling teachers to reflect on their practice and to use the outcomes to inform future practice. An essential part of the process is that the teachers are also involved in the analysis and evaluation of the outcomes.

Strategies are needed to ensure inclusivity for all members of group activities. A further problem in the initial phase of the research is to adopt a balance between being too prescriptive which may cause resentment or have the participants simply follow the researcher's suggestions so that the collaborative aspect of the process is lost as against allowing the situation to be too open so that the group lacks direction and purpose or they take discussion in an unproductive direction. Therefore, in order to get the process started the researcher may have to take on a more pro-active role by suggesting a structure for the enterprise but probably taking care not to prescribe the content. This emphasizes the need to be clear to all participants at the very beginning, about the motivation for undertaking the activity and the methodology used. Flexibility on the part of the researcher together with close observation of the way that the group reacts to ideas in this initial stage is also essential. Thus the researcher must be sensitive to the implications of the differences in context between one situation and another in which he or she is working.

An Outline Programme

The next section provides a brief outline of a generalized programme in order to illustrate how the methods that have been discussed in general terms might be formed into a project. It is based on specific examples taken from research conducted by the author. In all cases the participants made most of the decisions collaboratively. The following provides a description of the process but this must not be interpreted as prescriptive. It simply shows a possible sequence of events with some explanation.

- Initial discussion with a few key individuals to gauge the support for the idea. This is often followed by development of the idea and production of an

overall strategy with a few of the people who will be directly involved in ensuing group sessions.

- Formation of the group, with the first meeting as soon afterwards as possible. This may include a "needs assessment" and general formulation of the programme. In this early stage the researcher may be asked to provide some background material for the participants. A planned series of group meetings, probably about two weeks apart.
- Creation of a strategy with specific ideas for implementation.
- There may then follow a piece of action research, for example where a particular piece of pedagogy is trialed in the school.
- If some action research is carried out there may then follow an evaluation of the outcomes.
- Finally there is an evaluation by participants of the overall experience.

Getting Started

In planning work of this kind there is usually initial discussion with important individuals who may not be intended to be part of any subsequent group activity. This often includes the head of the institution and important senior staff and helps to ensure a satisfactory level of institutional co-operation. There may then follow further discussions with potential participants of the group activities leading to agreement about the general area of content. The first meeting of the group normally includes a needs assessment and statements about what different participants hope to achieve from the process. One of the difficult aspects of the enterprise comes at this early stage, when the methodology and the rationale are explained. This is important because the expectations of the group about the outcomes and the process will be mainly formed at this time. Adequate time is needed for questions and discussion, negotiation and agreement about how some of their concerns will be met. For example, when considering some of the important issues surrounding education for sustainability, many members of the group feel that they would like the researcher to take the initiative and simply tell them about the main issues and current thinking about the topic. It is frequently clear that they expect to be given further information to start them off. One way of addressing this need, without the researcher changing role too dramatically, has been to provide some brief articles or selected sections of articles for participants to read before the next session.[1] From their reading, participants can identify for themselves what they consider to be the main aspects of the arguments and ideas involved. On another occasion, a series of short controversial statements about the nature and purpose of education for sustainability for them to discuss has been an effective way of getting them to engage in the process.

Although the intention is to create a fairly relaxed atmosphere for the activity, it is generally essential at an early stage to set out some rules for how the group will conduct itself. Paradoxically these are often discussed and

agreed in a somewhat formal way. Problems within groups often arise because of differences in status and experience of the different members, the fact that some want to speak at length whilst others need encouragement to speak at all, some participants can be fairly negative especially in the early stages of the discussion, or there may be anxieties about the length of the sessions which may conflict with other responsibilities they have outside the group. Some strategies that have been used have included rotating the chairperson to give the opportunity for less experienced members to take on this role. The chairperson is made aware of the importance of limiting the length of time that any one person speaks and the number of times they speak and at the same time the need to encourage the less active participants to contribute. Efforts should also be made to value the comments made by each individual and to keep negative comments during the sessions to a minimum. However, at the beginning or end of sessions there should be the opportunity for individuals to state what they have found unsatisfactory so far and for this to be balanced by any positive comments. This provides frequent formative evaluation by the participants. It is helpful if each session is clearly time-limited with agreement about their length. Also the expectation that some people will do some further work between group sessions to move the thinking along and to present their ideas briefly to the group when they next meet can assist the process by providing greater momentum.

During the first group meeting it is usually most effective to place some constraints on the group following the needs assessment. Suggestions here can be made tentatively and it should be clear that by agreement they could be changed. Here limitations need to be placed on the field to be discussed and the advantage of setting out a series of aims that they would like to achieve. These are often arrived at by thinking about the sort of questions they would like to answer and how they might be able to answer them (see below). The aims are also influenced by the particular concerns that they have as practitioners.

Moving Things On and Maintaining the Momentum

Once the group sessions have got underway it is important at the end of each session to be clear about what has been decided and to agree on the next steps. Frequently this is formally recorded and used in the introduction to the subsequent session. Here the researcher/facilitator can become involved. During each session there are occasions when strategies need to be employed for moving thinking on. One simple method is for the participants to divide into smaller "buzz groups" to consider different ways of addressing a particular aspect of the topic and then report back briefly to the whole group. Another and more elaborate way of doing this is for the group to divide into smaller groups to create visual models of their thinking. An example of this was that a group set themselves the task of producing a

diagram to illustrate the multiplicity of factors that affect sustainability (see Gayford, 2001). In another case they produced a model of a hierarchical sequence of knowledge and skills to show how science education could help to develop environmental literacy (see Gayford, 2002a). These sorts of activities enable participants to clarify their thinking and to determine what questions they need to address to move their thinking on. They also significantly assist the process of reflection.

Concluding the Activity and Asking the Question: "Where Do We Go From Here?"

There also needs to be a mechanism for pulling it all together at the end. This is where the summative evaluation is important. The participants need to be involved in making their own judgements about what has been achieved. Putting the various ideas into practice leads naturally into different types of action research, which can then be reflected upon and judgements made based on previously agreed criteria. Thus, some of this work can go through a cyclic process, whereby participatory-reflective activity leads to trialing and testing ideas practically with classes and then collaboratively reflecting on the outcomes.

The Evaluative Process

It has been mentioned that the participants' involvement in the evaluative process is an essential part of the methodology. This type of evaluation involves judgements about the realization of the aims that they have set themselves in the early stages of the research. It requires clear articulation of the criteria that the participants will apply in making these decisions. This process of evaluation against criteria that practitioners have set for themselves provides an element of validity to the whole process. Frequently these criteria are directly related to practice, both past and in the future.

To illustrate the form that the evaluative process can take it is necessary to draw from examples of some of the work that has been undertaken. This means considering the broad aims that arose out of their practical concerns as teachers and then relating these to the outcomes. As an example the concerns of one group were that they wished to explore the contribution that science teachers could make to the teaching of controversial issues relating to the environment. They felt that it would help to focus their discussion if they explored these in relation to a specific example, which was teaching about global climate change. Their concerns were summarized as follows:

- How can science education retain its integrity as a subject discipline in the curriculum and at the same time help to address the issue of global climate change?

- What basic scientific knowledge is required by students for the study and appreciation of this topic?
- What broad understandings of the nature of science and scientific skills and abilities can be developed through the study of this topic?

Underlying these concerns were their worries about their own grasp of the issues involved and their ability to be able to simplify these for their students. Also, the fact that the science curriculum is already overloaded and they could see difficulties if they were to try to introduce new topics were concerns. They considered that it was inappropriate for them to be inculcating their students with their own views about the ethical, political and economic aspects of the matter. The aims that they identified closely reflected the initial concerns that they expressed.

The outcomes of their discussions led to a clearer understanding of what they, as science teachers, thought that they could reasonably achieve. This included an agreement that there were important scientific elements associated with global climate change that were already present within the science curriculum. Also, the topic lends itself to the teaching of a range of fundamental abilities and understandings about science, such as the provisional nature of scientific knowledge, the development of an historical perspective, the nature of evidence and how this is linked to prediction, analysis, and the formulation of theories. Furthermore, there was an appreciation of the contribution of science to problem solving as well as the limitations of science. Additionally, there are possible approaches to teaching a topic that is genuinely controversial and there is no clear consensus amongst experts in the field. From these outcomes the participants genuinely felt that they had moved their thinking forward in relation to teaching their own subject discipline as well as making a contribution to education for sustainability.

Another group was concerned about their own appreciation of the nature of education for sustainability and how this could be integrated into the science curriculum of young children. The aims that they devised were to:

- develop a clearer understanding for themselves of sustainability and education for sustainability;
- use this understanding to inform their teaching within the science curriculum; and
- consider ways of evaluating the science curriculum in terms of its contribution to education for sustainability and ways of assessing their students.

Following a participatory process, coupled with reflection, they arrived at a more developed understanding of sustainability and education for sustainability. This in turn informed their ideas about teaching young children and enabled them to arrive at a fairly sophisticated method of making judgements about how the science curriculum could help them to contribute to delivering

education for sustainability. Associated with this was a carefully developed way of assessing their students as they progressed through the different stages of their primary education.

Yet another group delayed setting their aims until after they had considered the particular implications of education for sustainability for their teaching. After extensive discussion of the various factors that affect sustainability, they set about constructing a set of aims that could be directly related to their teaching approaches. These were to:

- introduce their students to the sort of vocabulary that is in general use to describe concepts associated with sustainability;
- give their students an understanding of the way in which concepts and ideas, problems, and issues related to sustainability are interconnected;
- enable students to have an appreciation of the complexity of the issues and how they draw from a variety of aspects of human activity—scientific, technological, ethical, economic, cultural, spiritual, and so on; and to raise awareness that not one of these areas can make the total contribution to the understanding and possible solution of the problems;
- understand that issues affecting sustainability relate not only to the natural and built environment but also to the communities and societies involved;
- enable their students to appreciate the perspectives of others who may not share their views on appropriate action to achieve sustainability; and
- encourage their students to relate issues that occur on a global scale to their local context.

This led naturally into developing some imaginative teaching approaches, which were trialed with their own students as a piece of action research. These included life cycle analysis of an everyday object familiar to their students, in this case a pair of trainers. This was also linked to an environmental impact assessment. The evaluation that followed resulted in an interesting analysis and evaluation of what had been achieved.

On reflection, the participants felt that the activity that they had devised had helped their students with:

- learning and understanding new vocabulary associated with sustainability;
- practicing higher-order learning, of the type that involves analysis of information, synthesising it into a coherent form of understanding and arriving at their own conclusions;
- developing skills, such as finding out for themselves, representing ideas, posing questions, and communicating their ideas;
- critical thinking and evaluating information; and
- exercising socially critical attitudes.

In all of the three examples given above the activity enabled a reflective process to take place which, through participatory evaluation, the aims could be related to the outcomes.

In Conclusion

As an approach to research, the methodology described in this article has some obvious limitations. Within each group of participants there are usually problems of inclusion, which affects the quality and quantity of individual contributions. This is often aggravated by differences in status amongst participants. Consequently full consensus is rarely achievable. Keeping to the rules sometimes can be an obstacle to creative work, and care must be taken not to undermine the chairperson or to miss opportunities for digression that may be productive. Finally, and importantly, the process is open to all of the ways that people wittingly or unwittingly deceive each other through their natural defensive mechanisms.

Participatory methods are a hybrid of research and training methods, but the case for them being accepted as authentic research rests with the fact that it allows practitioners participating in the process to reflect upon and evaluate the outcomes. Although the researcher may diligently try to apply the methodology, perfection often seems to elude him or her. However, the benefits of participatory methods that enable the teacher to become a co-researcher are considerable and the approaches worthy of further development and application in many different contexts.

There is another final and important point that can be made. There are many different views about the nature and purpose of education for sustainability and many of the issues that threaten sustainability are controversial (see, for example, Jickling & Spork, 1998). As Payne (1999) explains, the implications of post-modern thinking for the sort of debate that surrounds the controversies of sustainability are important for formal education. The methodology described here provides a realistic alternative to universalist world-views and helps to relate to pluralist ideas where knowledge and the solution of problems is considered to be influenced by culture and context, arguing against the notion that every genuine question has only one true answer (see, for example, Berlin, 1969). Participation is an essential part of the empowerment of any group, including teachers. It recognizes and allows there to be a variety of ways in which approaches to education for sustainability can be developed amongst practitioners.

Notes

[1] Copies of the whole or sections of Fien (1998), Sauvé (1996), Tilbury (1995), and Panel for Sustainable Development (1998) were used to stimulate thought and discussion about the nature of education for sustainability.

Notes on Contributor

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