LOOKING BACKWARDS, LOOKING FORWARDS: A CONSIDERATION OF THE FOIBLES OF ACTION RESEARCH WITHIN TEACHER WORK

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ABSTRACT
This backward-looking reflection, which stems from experiences of an action research project with teachers, begins with an overview of current perspectives on action research in education settings. Significant details of the project are described to provide context for identification and discussion of the strengths and weaknesses relating to action research encountered by the author. Strengths include collegiality, dedicated time and space, facilitation and transparency and weaknesses discussed are issues of emancipation, the role of the researcher/facilitator, locus of power, data collection, professional development and teacher talk are discussed. The author attempts to orient both the methodology and the practical aspects of her action research experiences as a way to prepare for future research endeavors.

INTRODUCTION
A very long time ago, when I worked as a canoeing camp instructor, it fell on me to retrieve a couple of campers who had strayed across an Algonquin Lake to visit another campsite. The sun was setting, the air was turning cool and, halfway across the lake, I realized that I might have some trouble finding my way back to my own campsite in that vast, dark wilderness. The words of my mentor came back to me, “Always look backward to see where you are coming from. You won’t know where you are unless you look backwards once in a while.” I did so, and in the falling dusk the outline of two large windswept pines eventually guided me home.
As I travel life landscapes, both personal and professional, it has remained very good advice to look backwards once in a while. Looking backwards orients me; it positions me to move with confidence in whatever landscape I find myself. Looking backwards is a form of reflection that asks, “Where have I come from? What are the significant markers from which I can take my bearings and move onwards?”

It has been a couple of years since I completed the facilitation and analysis of the action research (AR) project that was the basis of my doctoral dissertation and I find myself on the brink of tackling another major AR project. But before I move forward, I find myself wanting to look backward; I need to re-orient myself in this action research terrain; I need to identify the significant markers that will guide me as a researcher and facilitator. Indeed, the AR terrain is not a flatland, simple and straightforward as far as the eye can see; it is a complex landscape with pathways that lead in many directions, from intimate group projects to sweeping vistas of social change. And there are many layers of involvement in that complexity; participants, researchers, facilitators, policy-makers; a diversity of inhabitants.

In this backward-looking reflection, which stems from an analysis of the literature about action research and my experiences in doing AR, I will begin with a brief overview of current perspectives on the AR model as it is employed in education research. I will recount the significant details of the AR project that led to the successful completion of my doctoral studies, after which I will refer to the AR literature to provide context for an identification and discussion of the strengths and weaknesses of my project.

The issues that arose include the logistical aspects of AR for teachers, the locus of power in the research group, problematic data collection, and conflicting roles for myself acting as both researcher and facilitator. The discussion is further complicated by the inconsistent perspectives between myself (the academic/researcher/facilitator) and those of the teacher participants. For example, what I took to be an example of a poorly enacted emancipatory Action Research project, was viewed by the participants as a very successful professional development exercise.

I hope to orient both the methodology and the practical aspects of AR as a way to prepare for further journeys through the AR landscape. Moreover, I write on the assumption that the successes and pitfalls that I encountered and reflect on here, will inform the practice of other action researchers.

**ACTION RESEARCH IN EDUCATION**

Action research has become a widely accepted “family of practices” (Reason & Bradbury, 2008) of qualitative investigation that is comprised of many variations of a simple cyclical research model, and enacted within and among diverse groups and communities. Reason and Bradbury provide a contemporary and succinct definition of AR:

> Action research is a participatory process concerned with developing practical knowing in the pursuit of worthwhile human purposes. It seeks to
bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities. (p. 4)

Three decades ago Stenhouse (1981) asked for a form of educational research that was unique and embedded in the work of teachers, and then went on to describe what would be known as action research. In their landmark work in 1986, Carr and Kemmis examined the AR teacher-as-researcher model of inquiry and its relationship to the development of educational theory. Current literature on the quality of AR used for research in education, (Capobianco & Feldman, 2006), requires the teacher participants and the researchers to function as a community of practice, intent on a set of goals or objectives that will require reflection and serious conversations; testing of ideas in practice; and knowledge generation and warranting, with the ultimate goal of improving practice. Action research by practicing teachers has been described as learning about learning in a format that encourages personal knowledge construction, rather than knowledge transmission (Zuber-Skerritt, 2002a). It interweaves reflection and action such that teaching improves (Goldblatt & Smith, 2005). In many ways professional learning is a social process (Altrichter, 2005) inasmuch as working with a group of teachers in an AR project offers “discursive support, practical support, dissemination of teacher knowledge, building up a community of professionals, and... a critical forum for research” (p. 13). Moreover, AR is accomplished amidst changes in praxis and has been deemed a powerful component in effecting that change (Altrichter, 2005). As teachers ask questions like, “What am I doing and why am I doing it?”, they are actively engaging in analysis and revision. According to Cotton and Griffiths (2007, p. 159), “In describing our world, we change it”. Wals and Alblas (1997) describe AR as a blending of theory and practice such that those who must implement curricular change are deeply involved in its determination, and Goodnough (2008) refers to ‘active, ongoing learning that is embedded in the everyday practices of schools’ (p.16). Postholm (2008, p. 1721) discusses how the emphasis on reflection in AR encourages “looking forward as much as looking backward” thereby connecting learning and action, and Moghaddam (2007) sees AR as a way that teachers develop both pedagogical and disciplinary knowledge.

Action research is not without its criticisms which include: its orientation as a form of inquiry; the accompanying crises of legitimation and representation; its value in teacher knowledge production and; the dual and often ambiguous roles of the AR researcher/facilitator. In their discussion of ethnography, and by association the position of the researcher/facilitator of AR, Denzin and Lincoln (2000) identify both the crises of legitimation (that the traditional criteria of validity and reliability are inadequate for qualitative research) and representation (that the researcher/writer is not separate from the observed experience). These crises echo the concerns raised by Chase (2005) and Kamberelis and Dimitriadis (2005) regarding the equivocal role of the researcher/facilitator/ethnographer; creating a condition wherein objectivity and subjectivity become blurred.
Action research is often seen as a process of professional development for educators by which they are enabled to examine a portion of their practice that is perceived as particularly problematic. The results of teacher-led inquiry are largely practical, with the goal of improving practice. However, Roulston, Legette, Deloach, and Pitman (2005) argue that teacher-researchers produce an inferior form of knowledge grounded in practice rather than theory; teachers have neither the skill nor the vision to adequately conduct research within a critical inquiry model and by conducting research in their own classroom they exploit their students and themselves rather than attending to the work at hand.

Nonetheless, based on the commendations of scholars such as Altichter (2005), Goodnough (2008), and Wals and Alblas (1997) I believed that the AR model provided a particularly apt research method for enabling teachers to explore the embedding of environmental education within secondary science curricula. And, although problematic, a participatory form of AR afforded me, the researcher/facilitator/ethnographer, to be at the same time a part of the experience being researched, as well as the observer and recorder of the experience. Moreover, inasmuch as a post-modern epistemology interprets knowledge and theory construction as localized and contextualized, AR seemed to offer educators a professional development opportunity to learn their way forward (Stevenson, 2007) through complexity. The ethnographic element of AR provides forms of data collection that grant the researcher entrance to the epistemological processes of learning forward, and though individualized and situated, would nevertheless provide rich material for analysis.

**PROJECT DETAILS**

My project was assisted by six secondary teacher participants; we met six times, at three week intervals, 2-3 hours at a time, over the course of a high school semester. The topic that I brought to the AR group was the embedding of environmental education in secondary science curriculum. The six participant teachers ranged in experience from a second-year teacher to a veteran of 20-plus years; there were three men and three women; all but one were white Caucasian, with the sixth being of Middle Eastern descent. The groups were drawn from three local high schools in a Northern Ontario town, whose industries are based mainly on natural resource extraction (mining and logging). Each of the participants was interviewed early in the project to give them an opportunity to speak individually about their current teaching practice and their environmental education experiences.

As the facilitator of the project I prepared the agenda for each of the six meetings as summarized in Table 1.
### Table 1: Summary of Action Research Group Meetings

| Meeting # 1 | - personal introductions  
| - reading and discussion of the nature of science teaching and learning  
| - introduction of the processes of action research |
| Meeting # 2 | - Reading and discussion of the nature of environmental education and its current status in the secondary science curriculum |
| Meeting # 3 | - Deliberation by the participants on what method(s) the group might use as the basis of their research |
| Meeting # 4 | - Assistance amongst participants in preparing and modifying existing lessons to incorporate some aspect of environmental education |
| Meeting # 5 | Lessons were taught in participants classrooms between the 4th and 5th meetings |
| Meeting # 5 | - Recounting and sharing of the experiences of teaching the lessons in participant classrooms |
| Meeting # 6 | - Discussion analyzing the project overall  
| - Sharing the journal writing of two of the participants.  
| - to afford closure, we heard from each of the participants, their thoughts regarding their experiences in the project |

It was not until the third meeting, as participants were trying to decide what form their research might take, that they fully came to grasp their role as action researchers. Initially the participants felt that they would simply compile a list of environmental resources for their peers, perhaps providing the resources online for easier access. This was a reflection of the type of professional development with which this group of teachers was familiar and comfortable, that is creating and sharing resources. Only when I pointed out that an AR project is a chance to investigate one’s own practice, did the group realize the opportunity to inquire whether the lessons, resources and teaching strategies that they might employ would resonate with their students. Given this clarification, the participants decided that on a specified day they would each, in their own classes, embed a component of environmental education within the lessons that they were teaching and observe the results amongst their students. I had the opportunity to visit and observe each of the participants’ classes during that time.
My data, as researcher and facilitator consisted of transcripts of meeting discussions and interviews (by far the largest portion), my own journal entries, and my notes on the classroom visits. The data collected by the participants was mostly in the form of observations that were shared orally during group discussion, particularly during meetings five and six. However, it also included one journal entry, three written narratives prepared by the participants, and several student-generated posters. I had hoped that the participants, as teachers of science, would recognize the importance of careful data collection; I had asked them to keep track of their thoughts and learning in a learning journal. I was somewhat surprised at their largely oral reporting and lack of concrete examples of lesson plans and student work.

Nonetheless, both sets of data (mine and theirs) taken together are rich with stories that describe the work and experiences of the participants and their students during the course of the project. The teacher participants’ data analysis occurred during several discussions, but my data analysis was more formal. My data was analyzed and coded by topics that either seemed to recur throughout, or topics that the group addressed at great length at least once. While the results of the data analysis in the area of environmental and science education are certainly interesting (they can be found in Steele [2010]) it is the analysis that focused on the use of AR as a professional development method that is germane to this paper.

My facilitation and observation of the AR efforts of the teachers relied on both an ethnographic and a narrative form of inquiry. As an ethnographic inquiry the project was an observation of and a participation in a specific group over time. Also, as the participants told their stories to me (the researcher) and to each other, the project became a narrative form of inquiry. In my role as researcher, I also acted in part as the ethnographer who observed the participants as they worked through the AR cycle. As a participant, I contributed my own narratives, which had direct impacts on the direction of the project. For example I shared a number of classroom practices in the field of EE and these were subsequently considered by the participants for their own lessons.

As described above, my role in the project was threefold: I acted as facilitator of the project, organizing the logistics and topical readings in preparation for the meetings; I was the researcher who proposed a research agenda and carefully collected data on the work of the teachers; and, I was also a participant in the group, who offered personal insights and views throughout the discussions. My enactment of multiple roles in the project was the basis of one of the dilemmas encountered during the AR project. In the section below, I discuss five weaknesses in the form of dilemmas that emerged. However, I begin by highlighting a number of strengths.

**Strengths of the AR Project**

*Collegiality.* I was struck by the eagerness and honesty of the participants. They seemed to achieve a collegial and friendly rapport amongst themselves and with me easily during the first meeting and in increasingly personal levels in subsequent meetings. As one participant
pointed out, the project was an opportunity to “share and discuss what you really think, not what other people want to hear.” The implication is that there are constraints governing acceptable ‘teacher talk’; whereas the teacher participants remained professional in their deliberations, nevertheless the normal constraints were absent such that honest opinions were voiced without fear of professional marginalization. That is consistent with the view that the AR model can provide a haven where teachers, as participants in a learning community, can explore new attitudes and new practices (Altrichter, 2005; Cotton & Griffiths, 2007).

The AR project provided the teacher participants with a rich opportunity for professional development, enabling them to enact pedagogical changes on their own terms within their own classrooms. One participant offered,

The value of coming up and saying ‘This is what I’m thinking of doing with my class.’ Getting feedback, suggestions, sharing the outcome, getting feedback. Imagine if you could do that on a weekly basis, with a new activity... or a new project. Just being able to talk to another teacher... how often does that happen?

Another participant commented,

I’ve been teaching for a long time and I think I’ve taught every Gr. 9 Science course over and over and over and I can just go... and its boring. Being in this group is refreshing for me... its making things more interesting for me.

_Dedicated time and space._ While the AR process was somewhat formalized, nonetheless, the teacher participants appreciated the time afforded them for this particular professional development. (All of the meetings were held during the school day rather than after hours so as not to add pressure to teachers’ already busy schedule; I had negotiated this with the respective school administrators.)

In addition, through a fortuitous lack of meeting rooms in any of the educational buildings to which we would ordinarily have had access, the AR group met regularly in the board room of the local Family YMCA. Our meeting room was a comfortable, bright space with modern furniture and windows overlooking the city towards the river; a space conducive to dialogue and reflection (Wicks & Reason, 2009). According to Capobianco, Lincoln, Canuel-Browne, and Trimarchi (2006) and Zuber-Skerritt (2002a) and distanced, to some extent, from the negative influences of the workplace. Indeed, the participants mentioned, on more than one occasion, how much they appreciated being out of their immediate work environments for our meetings. One participant voiced the opinion that while most professional development in which he had participated occurred over just one session, the AR model allowed the participants to collaborate over a period of time which provided opportunities for them to try different strategies in their classrooms, discuss the outcomes, and return to the classroom with modified strategies.
Facilitation. The teacher participants agreed that they appreciated the sense of direction that my facilitation provided. While I was disturbed by the level of my involvement, the participants felt that it was one of the reasons for what they perceived as a very successful project. The sentiment of one participant was echoed by the group:

We were able to get so much done...because we had a facilitator and we had a direction right from the get go. We started off with something that we were aiming for.

I understood that, dependent on the form of AR, there were varying levels of facilitation possible (Carr & Kemis, 1986), however, it had been my desire to give the teacher participants a large degree of control and autonomy over their work in the project. Although that level of independence on the part of the participants did not materialize (it is discussed below in the section titled Weaknesses), my consternation was not shared by the participants. Teachers work within a paradigm of hierarchical leadership wherein they expect to be given meaningful direction. They appreciated the readings that I provided, the ideas and experiences that I shared with them and the logistical coordination that allowed the project to move forward. In their view they had been given considerable leeway within the facilitation that I had provided; they had been given 'permission' by me and by each other, to explore and experiment in their teaching practice.

Transparency. The project afforded the opportunity for two levels of simultaneous research: the AR work of the teacher participants, and my ethnographic documentation of the work of the teachers. My work as researcher can also be considered a form of individual AR in the sense that after each meeting and interview I reviewed my data, reflected on my effectiveness and modified my approach for the next meeting. Certainly, the development of my skills as a researcher and an observer indicate a cycle congruent with that of formal AR.

While multiple levels of research can be viewed as a strength of AR, it is important to recognize that they can raise questions regarding the location of ownership of that research (Capobianco et al. 2006). For example: Does one research set take precedence over the other? Do they function separately or in hierarchical relation to each other? Recognizing and voicing the second level inquiry of the facilitator/researcher/ethnographer is important, according to Pedretti (1996), because it addresses the power structures within the group and engenders a transparency that can enhance the AR experience for all participants. Reid and Frisby (2008) refer to this as ‘reflexivity’: a critical reflection on the power relations, the underlaying values and accountability for knowledge production associate with AR.

The participants were very aware that, while their work was to explore the embedding of environmental education within secondary science curricula, my work as a researcher and facilitator was to provide guidance as well as to observe and record their progress. As a way of breaking down the structures of power placing the importance of my research above their work, I initiated on more than one occasion what I felt was open and honest
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As Jacobs (2010) points out, “Dialogue and reciprocity are key concepts in this approach” (p.370). It is with considerable confidence I can say that the multiple research processes remained transparent, if not entirely equal, throughout the project. This transparency was appreciated by the participants.

**Weaknesses of the AR project**

The weaknesses of the AR project described herein are best examined through a comparison to what I had intended as an ideal AR collaboration. My reading of the AR literature, and my personal experiences with professional development as an educator led me to envision an emancipatory and participatory form of AR in which the teacher participants would quickly seize the opportunity to delve with eagerness into an examination and improvement of their teaching practices. I anticipated that participants would share my critical views of traditional secondary science curriculum and also that environmental concerns would have a high priority. I expected that science teachers, who regularly teach about forms of inquiry, would easily grasp the concept of action research, and that I would quickly become the ethnographic observer, providing very little in the way of direction or control over the work of the participants. Many of the dilemmas that I consider in this paper are intertwined, so I look to the assumptions that I held at the time of the project to provide a framework for the problematization of the AR process in which I was facilitator, researcher and participant.

The Emancipatory dilemma. Carr and Kemmis (1986) outline three forms of AR when a researcher/facilitator is part of an AR project: technical, practical, and emancipatory; the latter giving the greatest degree of autonomy to the participants and the least degree of authority to the researcher/facilitator in terms of controlling the direction of the group’s learning. While my aim was to create a space for an emancipatory form of AR, in my view this was not achieved. The intentionality of the AR project described in this paper was not originally located with the group of teacher researchers, as is the case with true emancipatory/participatory research (Altrichter, 2005; Altrichter, Kemmis, McTaggart, & Zuber-Skerritt, 2002; Cotton & Griffiths, 2007). In fact, I had brought them together to address what were first and foremost my professional research interests in teacher development and environmental education. They agreed to work within my intentions, for my purposes, using an AR framework of my choosing. Indeed, there was a sense among the participants that they wanted to please me; they hoped to help me succeed in my doctoral studies. I believe that I was invested in the project to a degree that was not conducive to an emancipatory project. Although I strove throughout the project to give participants a strong voice and a large measure of control over the direction of their AR, they seemed quite happy to consider me ‘in charge.’ This raises important issues of leadership and power – dilemmas that I explore later in this section.

The Researcher/Facilitator dilemma. In my previous thirty-some years of teacher work I have developed strong leadership and facilitation skills through providing workshops and professional development for colleagues in education. Therefore, I felt fairly confident that I had the skills to enact the roles of facilitator (see Mackewn, 2008) and participant with a high degree of effectiveness. My skills and experience as a researcher were much weaker...
and in this regard I sought the ongoing support and advice of my doctoral studies advisors. What I did not anticipate was the complexity of enacting all three roles at one time.

Facilitating AR can be a form of professional inquiry and/or self-reflection (Pedretti, 1996) in which the facilitator takes on many roles, each of which have to be enacted in such a way as to maintain a balance of power between teacher/researchers and the facilitator/researcher. A number of principles proposed by Pedretti can guide the work of the RF: (a) teachers are viewed as experts and therefore act as leaders in many aspects of the research, however the RF can enable and enrich their experience (b) while each group is comprised of unique and possibly idiosyncratic individuals, it remains the work of the RF to set the tone (c) the composition of the group benefits from heterogeneity but issues of compatibility may arise and must be mediated (d) the groundwork for trust and motivation are laid by the RF and, (e) the facilitator may feel a dilemma arising from a sense of responsibility for each teacher to benefit from the AR experience.

Mackewn (2008) further elaborates the work of the facilitator by pointing out the inherent paradoxes in the position of facilitation. For example, the facilitator may find it necessary in one moment to nurture and support participants, and in the next moment to challenge them in their work. Jacobs (2010) points to the dilemma faced by the RF between striving to empower participants, produce scholarly work and provide a useful and practical project that does some good. Indeed, it seemed that the participants wanted external facilitation, they seemed to expect it. In their experience, professional development was a largely passive process. Now as I look back, I understand that my intention to offer the participants an emancipatory AR project could not be realized, in part because of my inexperience in navigating the complexity of the roles required by the RF and in part because of the participants’ past experiences as passive recipients of professional development.

_The Locus of Power dilemma_. The unfulfilled intention of the emancipatory process in my project leads inevitably to questions regarding the locus of power. Ospina, Dodge, Godsoe, Minieri, Reza, and Schall (2004) describe such a circumstance as a balance between authority and democracy. I had hoped that the participants would act with greater autonomy; instead the direction and directing of the project fell largely on me as the RF. The lack of independence of the participants may have been exacerbated in part by the tradition, in teacher professional development, of externalized control. My experience of professional development for educators has largely consisted of external speakers or workshops presented to a passive audience, usually on just one day, with no formal expectations that changes in practice would be implemented. Many teachers have neither the training nor the experience in taking charge of their personal professional development, and I had neither the wisdom nor experience to spend more time preparing the participants for authentic AR. Inevitably there arose some tension over what the work of the group should consist of, a condition referred to by Arieli, Friedman, and Agbaria (2009), as the ‘paradox of participant’. As the RF, I struggled to exert just enough control over the group for research and data collection to occur, whereas the participants pressed for the more familiar and practical work of collecting curriculum resources.
In truth, I felt a strong sense of obligation to the education administrators who had supported the research project through providing teacher release time and personal encouragement. The locus of power rested not only within the imperative of my doctoral research, but was influenced as well by the pressure that I felt to provide useful professional development opportunities for the participants.

The Data Collection dilemma. Qualitative research such as AR relies on the collection of empirical data from a variety of sources: transcripts of group meetings; transcripts of individual meetings, documents that teachers themselves collect as part of their normal classroom activities; teachers' journal entries that document the progress of each participant in the AR process, and facilitator/researcher journal entries that record the events of the project; as well as detail personal thoughts (Creswell, 1998; Denzin & Lincoln, 2000). Indeed, the researcher herself is a source of data in the sense that her thoughts, conversations, and journal materials contribute additional material as representational of the condition being studied. “The concept of the aloof observer has been abandoned [in the postmodern period]... The search for grand narratives is being replaced by more local, small-scale theories fitted to specific problems and particular situations” (Denzin & Lincoln, 2000, p.17).

The most troubling aspect of the AR project described herein was the lack of systematized, concrete or hard copy evidence collected by the teachers in their research. Since data collection is considered an integral component of research, this problem deserves some attention. It would have been very useful to compile evidence of student work, as well as consistent journal entries by the teachers, describing their thinking (and changes in thinking) over time. Robottom and Sauvé (2003) refer to this as building a research culture and identify it as a critical element in successful AR with practicing teachers. I made some assumptions about the knowledge and ability of the participants to engage in AR. Most notably, I assumed that, being science educators, they would understand the research process, as well as the importance and value of data collection. On both of these counts I was mistaken. Although, as science teachers they had taught the scientific method countless times, and I had spent some time during the first meeting outlining the AR process, the participants never fully engaged in a cyclical research process that generated much more data than that taken from meeting transcripts. It was my hope and request that the participants would keep a journal of their involvement in the project, and that they would collect and share student work generated by the project. However, neither of these occurred beyond one journal entry, three prepared narratives and one set of students’ posters. Foremost, the responsibility for weak data collection lies with me, the RF, in that I did not explicitly insist on some form of systematic data collection. To do so would have been to assert myself in a hierarchical role of authority which I had been very careful to avoid throughout our meetings.

The situation described above begs the question whether the teacher participants were actually doing action research. Although the qualitative research tradition recognizes data in the form of narrative, the participants themselves did not make any effort, other than
personal memory, to systematically collect and analyze their narrative data. Perhaps they never did see themselves as formal action researchers inquiring into their own practice. Or perhaps, taking Reason and Bradbury’s wider view (2008) that “action research is about working toward practical outcomes, and also about creating new forms of understanding” (p.4), the participants were arguably doing action research: they were broadening their knowledge, skills and expertise in delivering a richer, environmentally conscious, science program through the action research model of inquiry. Their work was one layer of the research project.

Certainly the participants knew that I was recording their conversations as data for use in my ethnographic study of their work. But I was more than an ethnographer, I was also a facilitator and a participant; which begs the question of whether or not I was doing action research. Based on Reason and Bradbury’s position above, I could argue that my AR project focused on the practical aspects of improving self-directed teacher participant inquiry and expanding my understanding of the facilitation of an AR project. Perhaps I can consider my data collection as another layer of the larger project. Alternatively, I can view my work as a separate study whereby I researched the work of action researchers. In any case, the complexity of the AR landscape requires continual and mindful reflection on the multiple sources of data and how that data is considered for analysis.

The Professional Development dilemma. The lack of participant autonomy as a manifestation of traditional professional development, and my sense of obligation to provide useful professional development have been discussed earlier. However, of similar interest to me was the circuitous path that the participants took to settle on a research question, and to agree on what would constitute their actual project activity. First, they suggested the most familiar activity for many teachers; that of sharing lesson plans. Then, they discussed the creation of an electronic resource data base of environmental lessons to share with their colleagues, as well as school-wide environmental study days. I continued to remind them that the action research model requires a common problem or question that needs to be addressed; that they should try to keep their project small, confined to the participant group; and that they needed to be able to generate and reflect on some sort of data. It was after an animated and exhausting exchange that they finally settled on their goal statement:

Can we model a small group approach to integrating environmental studies into curriculum?

Looking back, I realize that the teachers were treating the AR project as they would other professional development activities; their initial suggestions reflected their experience that teacher work should include generating resources and activities for colleagues. Certainly, an examination of their personal teaching practices, shared over time with colleagues, was not a familiar model of teacher development for them. The participants eventually fell into a routine described by Jacobs (2010) (based on the Ladder of Pretty) as ‘Functional Participation’ in which participants are involved in decision-making and the development
and execution of activities, while the researcher is in control and assumes responsibility for the project.

Whether this should be considered a strength or a weakness of the project is debatable, but it does underscore my inexperience in recognizing amongst the participants, the need for a thorough grounding in AR. Action research accommodates multiple cycles of lesson design, implementation, reflection and redesign; inexperience on both my part, and that of the participants, speaks to the need for more than one cycle in the AR process. Each cycle offers not only additional data, but also opportunities to further develop skills and understanding of the AR and professional development processes.

The Teacher Talk dilemma. While perhaps not a weakness of the project overall, finding the connections between pragmatic, practical teacher narratives, and the academic scholarly language of the literature certainly posed a difficulty for me. The participants communicated many of their ideas through narratives of their experiences as teachers. These stories, often humorous and entertaining, were told in commonsensical terms; it fell to me to interpret and translate their meanings into theory.

Indeed, it is at the point of data analysis and interpretation that the researcher’s voice becomes truly distinct from the voices of the group inasmuch as the researcher chooses what to include and write about. Friedman, Razer and Sykes (2004) caution that data collection and interpretation are inherently biased; that the researcher acts as the middleperson or translator (Glesne & Peshkin, 1992), bringing their own experiences and perspectives to the interpretation of data. In response, and echoing the work of Denzin and Lincoln (2000), Chase (2005) considers the implications of the researcher’s voice and suggests the importance of mindfulness in recognizing the multiple possible meanings in the transcription text. She encourages researchers to explore their relationships with the participants in order to understand how they might influence their interpretations, and to include extensive quotations from the text in order for readers to develop their own interpretations. Chase also suggests that before identifying distinct themes across the transcript texts, the researcher listen for the voices of each individual participant to understand her/his narrative strategies. Through mindful attentiveness, it is hoped that the subsequent analysis of data truly represents the thoughts and intentions of the participants, individually and as a working group.

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It has become apparent that the perception of success of the project was very different for me than it was for the participants. What I took to be a weak version of AR, the teacher participants saw as a particularly strong enactment of successful professional development. Indeed, judging the components of the project as strengths or weaknesses becomes a subjective exercise with substantive overlaps. The participants and I had different expectations, different experiences (or inexperiences) and different skill sets.

It might be most suitable to describe the AR project undertaken and detailed herein as a facilitated professional learning community that was given tacit permission (by me the RF
and by the participants) to explore their practice beyond the normal delineation of secondary science culture. Teacher culture and the professional development experiences of the participants limited the extent to which the participants were able to take on levels of autonomy and control in the action research. In addition, my looking backward informs me that my inexperience as a facilitator of AR was a significant factor in the lack of participant data collection. Replacing the moniker action research with facilitated professional learning community downplays the lack of data collected by the participants and portrays the work of the participants in a more accurate and positive light.

I began this paper with the assumption that looking backward would allow me to identify significant markers by which to orient myself on my AR landscape. My reflections have identified the following elements that contribute to a successful AR project with teachers:

- a) A thoughtful and thorough preparation of dedicated space and time that does not increase teacher workload, but does provide a venue that is informal and away from the normal workplace.

- b) Mindful facilitation of participant interaction and action, realizing that many participants are normalized to traditional forms of professional development and thus may be content with external facilitation throughout the project. The RF voice and agenda can overpower a project, therefore, participants may need explicit encouragement to take ownership of their research.

- c) Training and experience in AR both for myself and the participants with whom I work, taking into account that the traditional professional development model for teachers does not adequately prepare them for the AR model. Direct instruction in AR, as well as the opportunity for more than one AR cycle, is required is very useful.

- d) Mindfulness and transparency regarding the locus and shifting of control in the group are necessary, whereby I clearly speak to control issues of the project at different times and encourage participants to do likewise.

- e) Mindful attention must be given to the individual voices that inform the analysis of data, acknowledging that the differences between the language of academia and the vernacular of the classroom teacher are often incongruent, and need careful consideration.

The importance of looking backward, commonly understood as reflective practice, is pervasive in education and AR literature and certainly most reports of research include comments on its strengths and weaknesses. However, looking back on a research project shortly after its completion renders a different view than that gained after some time has passed. Time and distance offer a broader perspective; looking back at the shoreline from my canoe, it was not until I had achieved some distance, and the silhouette markers on the
horizon were distinctive, that I truly understood where I had come from and where I needed to go.

None of the markers that I have assigned to my landscape are new to the general landscape or literature of AR (see for example Grant, Nelson & Mitchell, 2008) but I have identified them as significant to the personal research path that lies ahead for me. In future research projects, these are the signposts to which I must attend.

REFERENCES


**Biographical note:**

Dr. Astrid Steele is an Assistant Professor in the Schulich School of Education at Nipissing University where she teaches Science Education. Her career in education has included work in outdoor/experiential/environmental education settings, adult re-training, teaching in the elementary and secondary panels, and extensive work in teacher professional development. Her current research interests focus on the intersection of environmental education and science studies, particularly at the secondary level, as well as the positioning of STEM and STSE within science curricula.