AUTHENTIC INQUIRY AS A CONSTITUENT OF METHODOLOGICAL BRICOLAGE

Abstract In this chapter I trace the methodologies I have used in the 45 years in which I have done educational research. The evolution shows continuous change in research focus, theoretical frameworks, and research methodologies. I focus on the emergence of authentic inquiry as a central component of multi-level, multilogical frameworks that are ethically grounded with the goal of all participants benefitting from their involvement in research.

Interventions have framed my research from the very beginning. However, the purposes of interventions have changed from being part of statistical tests of research hypotheses to endeavors to catalyze change and thereby benefit all participants equitably. As we have become comfortable with multilogical approaches to research that is framed with multiple social theories we have introduced radically different theories to understand the dynamics of emotions, wellness, and the enactment of social life. In that context, I present Jin Shin Jyutsu as a knowledge system we have used in interventions and analytically to make sense of ways in which living things use touches and holds of the hands to ameliorate excess emotions and sustain wellness.

Keywords dialectic relationships · cogenerative dialogue · collaboration · teacher | researcher · difference · authentic inquiry · event-oriented inquiry · multilogicality

There’s more to doing research well than simply turning up and getting started. In my first study, back in 1973, I knew that I had an interest in verbal interaction and student learning of science (Tobin 1980). My focus was on how to theorize learning and the framework that appealed to me was Jean Piaget’s genetic epistemology (Piaget 1964). The methodology was to be rigorous and since my previous experience with research was in physics, I leaned, and was steered toward a quasi-experimental design that utilized statistical testing of hypotheses. The different theories underpinning my research focus and the research methodology was not an issue that I spent time with. To some extent the research methodology and its underlying crypto-positivism were taken for granted – accepted as valid and rigorous (Kincheloe and Tobin 2009).

A follow up to my initial wait time study was undertaken in the USA, as part of my doctoral studies at the University of Georgia. By this time competing theoretical frames, such as radical constructivism, were part of my repertoire, and I was aware of scholars using qualitative data as a basis for empirical work. My research continued on from my earlier work, but there were tussles, especially in relation to

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Piagetian ways of thinking about learning and alternatives grounded in neo-behaviorism (Vargas 1972).

My post doctorate years were challenging in the sense that I was dissatisfied with the theoretical frames I used to make sense of what was happening and why it was happening and the methodologies we were using. The key frustration about methodology was that the research focus was misaligned with what was happening in the classes we studied and did not easily accommodate emergence and contingency. Also, reductionism was a problem. I felt that the number of questions to be answered after each study was increasing, raising the prospect that after a decade of research on wait time there was at least an additional one or two decades of research needed to study the increasing number of questions. At the same time, questions that addressed macro issues seemed beyond the capacity of research of the sort I was engaging.

The work of Ernst von Glasersfeld (1993) was appealing in that it oriented toward sense making of individuals. Furthermore, as we wrestled with issues about ontology and epistemology we obtained important insights about issues that framed our research and methodologies we would use to explore them. As we moved from statistical analyses to interpretive research, many concerns about emergence and contingency began to be resolved, as were our concerns about ontological status of our work.

THE PRIVILEGE OF TEACHING

Those of us who are fortunate to be scholars, are privileged stewards for the integrity of learning, doing, and teaching within a knowledge domain or field of inquiry. There is much to unpack in this opening sentence, and I take a deliberative approach to so doing. Mirroring the words and practices of Joe Kincheloe, my approach is radically hermeneutic (Kincheloe 2008). That is, meanings I ascribe to the constructs included in the initial sentence, and those that emerge throughout this chapter, reflect their meanings in use. Context and entirety (i.e., the whole) are important resources in judging what I mean by my claims – not cherry-picked sentences from here and there. Also, in making judgments about what my claims mean, it is essential for readers to realize that meanings of all claims are underrepresented – that is, I always mean more than can be represented by language/text. In addressing meaning making with this introductory salvo of words I do not seek to absolve myself of responsibilities to be clear, thorough, and detailed. To the extent feasible in a book chapter, I show the roots of my ideas; and, through thick description, I show how appropriated ideas are populated with my intentions and are further mediated by my experiences – in this case, principally as teacher, researcher, and learner. As is always the case, meanings are historically constituted and, to the extent possible, I include historical traces so that readers can consult other resources to elaborate meanings, which are always expansive and never complete.
The Sheffer stroke (|) represents a dialectical relationship. My first uses of dialectical relationships in my research were in collaboration with Wolff-Michael Roth (hereafter Michael), a colleague with whom I undertook almost two decades of intensive research, mostly grounded in teacher education and teaching and learning science in urban schools in Philadelphia and New York City (Roth and Tobin 2002). In our use of dialectical relationships, Michael and I assumed each of the designated constructs (e.g., teaching | learning) as presupposing the existence of the other. That is, in this example, teaching and learning coexist, each being a constituent of a whole, and each is recursively related to the other. Accordingly, it is incomplete and possibly misleading to focus on either teaching or learning, without also, at the same time, focusing on the other. Of course, meeting this requirement is not feasible and is an example of a crisis of representation. In my research, (hereafter our research, to acknowledge contributions of numerous others) I seek to be nuanced in making any claims, especially those which involve parts of what I consider to be a whole. Even when I am teaching, I am simultaneously learning – hence the question, "what am I learning?" can always be asked with the expectation of providing a detailed answer.

“Fortunate to be scholars” is a reminder that teaching and all that goes with it is not considered a right – but instead, is a privilege that demands humility of the teacher, along with a mindframe that includes respecting self and others explicitly – especially students. In addition, each teacher also would exhibit care, compassion, empathy, patience, and interest in the other – once again, with an emphasis on all students (and other salient stakeholders), not just those who are most similar to the teacher. To say it differently, a teacher goes further than tolerating difference; to embrace valuing difference highly as a resource from which everyone can learn. Being aware of the privilege of teaching is a reminder to not take the job for granted. I should note, what is obvious. I began with scholar in this paragraph and switched to teacher. This is no slip of the tongue. I regard teaching as noble and scholarly. All teachers are scholars and, at the same time, researchers. Scholar emphasizes that teachers have responsibility not just for learners and learning, but also for the knowledge domain and ways in which knowledge is represented in fields of the lifeworld. Just how the teacher-scholar enacts roles that are consistent with these responsibilities involves vigilance, attentiveness to what is happening, and awareness about and focus on actions that are most salient in the moment. That is, scholar, as I use the term here, embraces ongoing/continuous participation as researcher – for myriad purposes.

A steward, or custodian, carries the idea of protection and caring. There is an implication of proximity and strong social bonding that involves teacher with social artifacts, including learners – that is, structures associated with learning in a particular social field. A steward is responsible to protect, nurture, and not to allow contamination, erosion, and destruction of the knowledge domain. Stewardship goes beyond focusing on getting students through tests. A steward is responsible for closely monitoring what is happening, identifying what is being learned, and enacting curricula in ways that assure that learners produce new culture that is sub-
sequent enactment appropriately. There is a holistic aspect to reviewing appropriateness. The teacher should engage practices that are reflexive so that s/he is able to ascertain what has been learned and how it can be represented. Inevitably, some of the learning that occurs will be unsuitable, because of concerns about ethics and values (e.g., without being aware, as teachers become like the other by being with others, they may shout at students who provide what teachers consider to be incorrect responses). In such cases, teachers and learners need to heighten awareness about ethical concerns and, as necessary, review and revise while elaborating what is being learned. Frequently, this is accomplished by a reflexive activity like cogen (Roth and Tobin 2002).

When I relocated to the University of Pennsylvania, in 1997, I agreed to be Director of Teacher Education and also to support a study designed by Fred Erickson. Basically, the research required urban youth to be experts about their learning and to coach their teachers on “how to better teach kids like me.” I thought it was a terrific idea and got involved enthusiastically. However, what I learned, mainly by having my own youth coach, was that urban youth had the occasional good idea and also a lot of bad ideas, many of which were neither practical nor ethical. For example, we might be discussing an event that occurred during a lesson and their advice might be to send a student outside and make an example of him/her. Often it was worse. Rough them up a little was frequent advice. Even allowing for some suggestions to be offered as metaphors or even as a joke—they were impractical and it was necessary to listen attentively, explore ideas from all participants, and not to privilege anybody’s voice. Importantly, we realized that students benefitted from speaking and being heard, and listening to others with the goal of understanding their positions.

In our research, we usually had two urban youth, who would meet with one teacher. Later, when we used coteaching, the two urban youth would meet with two (or sometimes three) coteachers. As group size grew to include other stakeholders, such as the classroom mentor teacher and perhaps a university teacher educator, we designed some rules to allow all participants to contribute orally in an equitable manner. We developed an approach that was dialogic in the sense that conversations would not rapidly change direction but would instead create a focus and ensure there was synchrony between successive turns at talk. Also, after there was consensus that the group had exhausted the potential of a particular topic of conversation a fresh focus would be established. The goal of the activity was educative, catalytic, tactical and ontological. After cogen all participants would change their stories of what happened, they would know about others’ different perspectives and understand them, they would ensure that all participants contributed equitably to cogen and that changes would be catalyzed at group and individual level. A feature was the participants agreeing on what consensuses emerged from cogen.

An important rule that we insisted on was that only coparticipants from a lesson could be involved in cogen. We did not want participants who might not have been involved in the class, who would come to the table as experts. We wanted all dia-
logue to be grounded in the shared experience of a class in which all cogen participants also were coparticipants in a class. This decision had its roots in the idea that “experts” could not watch a class from the side and pass judgment on what should have been done. If it should have been done, then the person who thought so should have stepped forward to get it done. In my own work as a teacher researcher in an inner-city school in West Philadelphia I had many colleagues; experts, who wanted to come and watch me struggle to teach and share their wisdom on what to do and how to do it. I consistently let them know they were welcome as long as they came ready to work with their sleeves rolled up. They could contribute as coteacher and co-researcher at which time they would have co-responsibility for what happened. In these circumstances, they could speak exactly as much and with the same heft as other coparticipants in cogen. None of my colleagues accepted this invitation!

RESEARCH

Research must be continuous. All participants are researchers and should enact their roles with awareness that they are engaging in participatory research for many reasons; some of which relate to improving quality of teaching and learning in an emergent, contingent, and ongoing manner. Research is not an activity that needs to be switched on and off. Research is a constituent of a whole we might call education. Obviously, we cannot be explicit about everything that is happening at its moment of happening – that is, this is yet another example of a crisis of representation. Certain things that happen will be emphasized and at other times what is happening in those respects will be in the background (i.e., will not be considered salient). However, it behooves us to be explicit about the constituent status of research in relation to education. The consequences for this include an assertion that everyday life in classrooms involves research – forms of inquiry that can provide answers to what is happening, why it is happening, and ascertaining what more there is to what we have learned so far.

I do research in all classes I teach and have done so for many years. Russell Yeany, a mentor during my doctoral degree, emphasized our responsibility to conduct research and learn from it every time we teach a class. Nowadays I create digital video and audio records for each class, making those resources available to all participants (e.g., doctoral students) as resources to augment learning and address research issues that arise as the semester unfolds.

It is essential that research, as it is described here, benefits from peer review that explores ethics alongside of other quality criteria. At the same time, steps need to be taken to prevent ethics committees from discouraging potentially invaluable studies based on values-stances such as – good research should embrace tenets of positivism that include specific research questions and hypotheses, objectivity, and, video and audio data resources should not be approved for use in research because of the risks of harm. There is dire need for transformation of the ethics review and approval process – changing what happens so that good, ethically solid research, is undertaken in classes continuously. Based on my experiences with many ethics committees in universities there is a tendency for individuals and
groups of individuals to act officiously and privilege their own preferred methodologies over what a researcher has proposed. This often leads to a protracted process in which the researchers progressively give ground until what is proposed aligns with one or more IRB member’s preferred methodologies. Furthermore, often times IRB personnel appear to forget their purpose, which is to focus on the ethics of proposed interactions with human subjects. Instead there is a tendency for them to insist that the design of a study align with their preferred way of doing research with human subjects. It is time for change.

WHAT IS GOOD RESEARCH FOR CLASSROOMS?

Getting on the right track

In a formal sense my first research in classrooms was launched in 1973 with the study of extending teacher wait time and science achievement (Tobin 1980). However, as I began to formulate this sentence I realized that my research began when I started to teach science in 1964. I was in a somewhat unusual situation of teaching high school science and mathematics without a solid background in those disciplines. Accordingly, I was vigilant in regard to teaching science and mathematics content appropriately and on the lookout for collaborative learning methods to engage students in a variety of group structures to better address the challenge of multi-grade and sometimes multi-subject curricula being taught in the same class. For example, in the same hour, my teaching assignments sometimes required me to teach science to students in grades 8 and 9 and mathematics to students in grade 10 (i.e., at the same time in the same classroom). This was a challenging assignment, especially for a beginning teacher. Clearly, I was heavily involved in ascertaining what was happening, why it was happening in the ways experienced by me and my students, and how best to change class structures to improve learning. Though the research was not formal, it was an important tool for me, as a beginning teacher.

Similarly, I can also make a case that my life as a researcher began in 1950 when I attended a small school in rural Australia. In many ways students are centrally placed to benefit from their active involvement in research on learning and teaching. In my case, I was frequently involved in such research as I critiqued teaching and my own learning – and I am certain I would have benefitted from conversations with others about what we all were learning from our research. No doubt there would be considerable benefit, for me, other students, and our teachers in learning about the theoretical frames we used in such research – especially how the teachers and peers were thinking about learning and, for that matter, teaching. Importantly, the research that occurred from 1950 through 1973 was informal, continuous, and involved stories and qualitative data resources. Certainly, we engaged in research without explicit awareness that this is what we were doing. We were untutored in how to do research and even in what research was. It also seems clear we were on the right track.
Deviating from the Right Track

By the time I started research on wait time I had completed a physics degree and was finishing up a master’s degree in applied physics. As part of my master’s degree I was permitted to do research in physics education. My supervisors were primarily concerned that my research was valid. As physicists, they had no formal experience with research in education, and in the early 1970s, there were few studies of what happens in science classrooms. Accordingly, my research was a quasi-experiment that involved research questions, an intervention, variables, research hypotheses, and statistical analyses. Until 1984, I continued with this type of research design, tweaking design to address ethical concerns as they arose in our research. A review of research undertaken on wait time during this period was extensive, impressive and to some degree at a dead end in need of fresh methodologies and framing theories (Tobin 1987).

By 1984, concerns I had with statistical analyses, variables, and reductionist models were numerous. Also, I was greatly concerned with lack of emergence and contingency, to allow researchers to focus on what was happening in the moment and learn accordingly. Also, macro structures concerning ideology and policy mandates – such as privileging performance on high stakes tests, were increasingly problematic. Much of what we were asking teachers to do re fostering science inquiry seemed to be at odds with social forces associated with teachers feeling compelled to teach to the test. We were ready to change what and how we researched. The catalyst for change was a draft version of Fred Erickson’s chapter on interpretive research – which I obtained in pre-published form in 1984 (Erickson 1986).

In 1984, we initiated interpretive studies of high school science classrooms in Perth, Western Australia. Participants in our research included Jim Gallagher (Tobin and Gallagher 1987) and Patrick (Tobin and Garnett 1988) and Pamela Garnett (Tobin and Garnett 1987). Viewed with hindsight, the transition to interpretive research was gradual, especially as it related to selection of participants. However, the focus of the research was basically hermeneutic-phenomenological, using qualitative data to produce assertions and explicit attention being given to contradictions. Essentially, for our first time, the studies we did embraced radical constructivism (Tobin 1993), emergence and contingency.

Based on our experiences we consistently changed how we did interpretive research, including uses of narrative, composite characters, fiction, and ethnomethodology (Garfinkel 1967) – what more is there? Our overarching framework was cultural, where culture was consistent with cultural anthropology and the frameworks developed by Clifford Geertz (1983). Currently we employ William Sewell Junior’s post-Bourdieuian theories of culture, close to 180 degrees different than the Geertzian frames that catalyzed our changes in research methodology (Sewell 2005). In addition, we are conscious that in settled times culture can be difficult to see as people enact social life using their cultural resources fluently, and often without conscious awareness (Swidler 1986). However, if there is a disturbance, that is a disruption that unsettles, previously hidden forms of culture can reveal themselves. The disturbance, or “spike in the curve” is at the heart of event-oriented inquiry, which I describe later in the chapter, and is consistent also with
culture being experienced as patterns that have thin coherence together with dialectically related contradictions (Sewell 2005).

WHAT IS GOOD RESEARCH FOR CLASSROOMS?

Fourth Generation Evaluation

Egon Guba and Yvonna Lincoln wrote a volume that radically changed our thinking about the purposes of research (Guba and Lincoln 1989). Although their book focused on evaluation, we appropriated their ideas for use in research. Their approach was revolutionary, even though to some degree they played it safe by including a set of “parallel criteria” for judging the quality of an evaluation – alongside four authenticity criteria. The parallel criteria were like a checklist that could be used in planning a study to assure those who reviewed the evaluation that it was solid, credible, and authentic. To some degree the parallel criteria were a safety net that many of us found appealing. The list allowed us to proactively design studies that could be defended convincingly and comprehensively. Guba and Lincoln also pointed out that the authenticity criteria could stand alone as justification for the quality of an evaluation. It took many studies and many years before we realized that the authenticity criteria were a foundation for where we wanted to go with our research. As was the case with other revolutionary methodologies, such as interpretive research, our transformation felt marked and very different when we embarked on Fourth Generation research – but in hindsight, changes were gradual, and transcended decades.

With colleagues that include Stephen Ritchie, Alejandro Gallard, Deborah Tippins and Sarah LaMaster, we pushed boundaries of methodology as we undertook research in classrooms in the United States, Australia and, via our students and colleagues, in many, if not all, countries of the world.

Why Can’t Sarah Teach the Way She Wants?

Sarah LaMaster was hired as a science teacher | researcher at a University Lab School in the late 1980s. She was well qualified and wanted to be a teacher | researcher. Importantly, what she learned from doing research in her own classroom would be used in science teacher education courses and associated practices at the university. In addition, we engaged collaboratively with Sarah, as researchers (To- bin and LaMaster 1995).

Although we emphasized participatory forms of research, with hindsight, there was a major ethical shortcoming in our work. We left Sarah to do the teaching while we did research, not from the side, or as flies on the wall, but certainly we left her to teach, even though she struggled. She set the foci for research and we let Sarah know what we were learning from all participants. Looking back on it, we showed empathy – but we did not walk in her shoes. We advised her on how she “might” change to improve the quality of teaching and learning.
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To be accurate, what we did was revolutionary and we learned a lot. However, I argue that today it would be an outrage to be in a classroom and not arrange to do research by experiencing learning environments as a bona fide coteacher. We should have endeavored to walk in Sarah’s shoes.

Cogen would have been an ideal activity to bring all participants to awareness about what they thought was happening and why it was thought to be happening. However, this research occurred a decade prior to our work on cogen (Roth and Tobin 2002). As a methodology, cogen would have greatly improved our approach by helping us to understand “how to better teach kids like us.” In a later section I address how this approach moved us more quickly toward authentic inquiry. First, I explain how collaborative research with Steve Ritchie got us to formally include students as researchers.

Kids may be researchers – but they will always be kids

With the classroom teacher, Steve and I selected Darcy to be a learner | researcher (Ritchie, Tobin and Hook 1997). Basically, we were primarily involved in interpretive research and we formulated Darcy’s roles accordingly. We saw her role primarily as writing about what happened in class and why it happened. For some inexplicable reason, we did not focus on her oral narratives and nor did we realize the amazing potential of dialogues between participants, concerning what happened, why it happened, and how to change things to improve learning. However, for our research, the formal involvement of a student researcher began with Darcy and catalyzed a practice that continues to the present.

Ethics and Equity as Essential Foci for Research

During a decade in which I was a professor at Florida State University, my research was greatly influenced by Alejandro Gallard, who constantly raised questions about ethics and equity (Tobin, Tippins and Gallard 1994). He convinced me that research on equity should not be left to researchers who identified as racial, ethnic, language, and gendered minorities. From his perspective, it was paramount that all researchers adopted critical lenses that challenged and interrogated what is taken for granted as normal and common sense. His presence was a constant reminder to embrace critical pedagogy (Kincheloe 2008), ethnomethodology (Garfinkel 1967), and otherness (Derrida 1998). We collaborated on a large professional development project in Miami, Florida – and established a framework for heightening equity in our research in urban schools.

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We adapted a fourth generation framework in most of our research from the early 1990s onwards. Gradually we changed from emphasizing parallel criteria, such as member checking and peer debriefing, to primary use of the four authenticity criteria in designing and enacting studies. Eventually, we critiqued and changed the meanings we assigned to each of the authenticity criteria, which we began to re-
gard as an ideal framework for assessing the quality of many research activities, including cogen.

**Ontological Authenticity**

As is the case for each of the authenticity criteria, ontological authenticity applies to all participants. Furthermore, the four criteria are dialectically related to one another and all are constituents of a whole – the authenticity of educational research. Accordingly, in addressing the meanings of any one of the constituents, we inevitably begin to explicate meanings of the interrelated authenticity criteria.

Ontological authenticity relates closely to hermeneutic-phenomenological questions; respectively, why is it happening? and what is happening? Importantly, as a result of being a participant in authentic inquiry, each person should change his/her ontology – narratives associated with answers to the above questions and others like them. Within our studies we usually say that all participants will change the stories they tell about what is happening and why it is happening. That is, all participants should show evidence of what they learned in a study. Of course, we can relate this to frameworks illuminating reality in particular ways. As a study educates participants, they expand and otherwise change frameworks; hence, they narrate in ways that reflect transformations.

Conversations with Joe Kincheloe played a big part in our changing the way ontological authenticity applied to participants. For many years we considered ontological authenticity primarily to university-based researchers and, the more we thought about it, the more central we saw this issue to be. We came to realize a folly in confining ontological authenticity to just one stakeholder group and recognized the power of designing and enacting research in which all participants would change ontologies and, as part of our research, we would gather evidence of changes and reasons for them.

**Educative Authenticity**

In an investigation in which authentic inquiry is part of methodology, participants should be provided opportunities to learn about one another’s interpretive frameworks. The goal is to understand perspectives of self and others – not to critique and disagree, but to explore the potential of difference and discover advantages associated with particular frameworks as well as limitations. The purpose is educative and liberatory. It is not part of educative authenticity to persuade others to accept what you might regard as truth. Based on personal experiences, including activities designed to educate all about others, there are continuous opportunities for learning from and about others through emancipatory dialogues (i.e., such as cogen).

**Catalytic Authenticity**

Catalytic Authenticity is related to transformation that is evident in culture (i.e., practices and schema) – enacted and transformed. The research serves as a catalyst
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in that it provides fields in which individuals and collectives change what they know, think, and do. Unlike the catalyst in a chemical reaction, the research itself is not insulated from change. Its emergent and contingent nature necessitates ongoing review of what is planned and done, based on what is learned.

Tactical Authenticity

Tactical Authenticity is an equity criterion that recognizes that some participants are better placed than others to benefit from research. Accordingly, the enactment of research is responsive to what we learn about individuals and collectives – ensuring that activities are designed with concerns for equality of beneficence deriving from being involved in research. We have learned that activities designed to provide tactical authenticity are often interventions and might be afforded by such activities as cogen, coteaching and, in some cases, interactions intended to overcome unethical actions of others, that is right action, which is central to many aspects of tactical authenticity and its quest for equality and freedom through promotion of emancipatory interests.

Applications of Authentic Inquiry

Once we appropriated authentic inquiry we realized it could be used as methodology for examining the quality of social activities – in this case constituents of research design and enactment. For example, we frequently employed coteaching and cogen in our research. Accordingly, it made sense to ask questions about quality of enacting these constituent activities. From this perspective, authentic inquiry criteria can be used macroscopically to assess the quality of research and with a finer grain to assess quality of constituent research activities such as cogen. Use of authenticity criteria in this way allows a researcher to go beyond providing a statement that coteaching, for example, was used in a study. The nature and quality of coteaching can be explicated through the use of the authenticity criteria heuristically.

Ethical Overarching

Our approach, at all times, needed to be fair, caring, courageous, and honest (Sockett 1993). We regarded these four criteria as dialectical constituents of research practices (i.e., practical wisdom) that did not bear witness to unethical conduct without intervening to prevent it continuing and thereby threatening wellbeing of individuals and collectives. In a Buddhist tradition, this is considered right action (Hahn 2011). The idea is to act with compassion for self and others and not to feign social distance and fail to respond to inequitable conduct by individuals and/or collectives. When harms occur, it is important to act to prevent their continuance.

In the mid 1990s coteaching and cogen were developed as central activities we associated with improving the quality of teaching and learning to teach. Almost immediately we noticed these activities could be used in evaluation and research
In particular, within authentic inquiry, coteaching and cogen were activities that were generally applicable throughout a study that was collaborative in its design and enactment. For example, had we used coteaching in the study with Sarah, we would have learned first-hand about teaching practices that might be used to improve/enhance learning environments we were studying. That is, in an epistemological sense, we could have learned by being-in-with Sarah as a coteacher. Similarly, cogen would have enhanced the quality of interactions among students and coteachers. That is, we could have utilized the feature that cogens were seedbeds for the production of new culture to catalyze desired transformations among the individuals and collectives involved in the research.

HEURISTICS

Reflexivity, or becoming aware of the unaware, was an important underpinning of authentic inquiry in the sense that opportunities to consciously change culture that was deleterious to one or more participants necessitated awareness of what was happening in the moment and why it was happening (Bourdieu 1992). Hence, in the research design and subsequent enactment, we set out to heighten awareness about salient forms of enacted culture. There were many activities, such as cogen, that could afford heightened awareness. Another was to design heuristics based on what we were learning from a study. Basically, the way we thought about heuristics was to identify a salient construct, such as mindfulness, and then to identify characteristics of the construct that individuals could think about in relation to their personal conduct (Tobin 2016). The intention was not to identify all characteristics associated with a construct like mindfulness, just a manageable set that “covered the territory” and provided focal points for reflecting on personal conduct. By heightening awareness about personal conduct, individuals could then consider whether changes were necessary. Inevitably, the inclusion of characteristics in a heuristic for a particular construct is an opportunity not only to expand narratives about what is happening, but also to create narratives about values – that is, what should be happening. The changes in focus on specific values are affordances for transforming learning environments. It also is important that heuristics can be changing to keep up with ontological authenticity – as changes occur, possibilities emerge, and characteristics of a construct can be expanded to reflect both, what is possible and what is of value. We refer to this feature of heuristics as the shape shifter nature of heuristics, whose characteristics are radically contextual – reflecting the field and its structures.

Heuristics have a variety of textual forms, including those that look like rating scales and others that contain assertions on which to reflect. In the former case, there may be 15-20 characteristics on a page on which a respondent is requested to assess frequency with which s/he enacts a particular practice/form of conduct. In the latter case, a different reflective text could be provided, for example once a day. Similarly, non-textual characteristics can be provided to heighten awareness about what is happening, why it is happening, and associated values. For example, video and single frames can be used for reflection and to draw attention to particular features of social life that have salience to a study or part of it. Of importance is
to note that a heuristic is intended to be a catalyst for change. Clearly it is not the only possibility for disseminating what has been learned from a study to benefit participants – but, it is one approach we have found fruitful (Tobin 2015).

The following characteristics were used as a pool from which selections and appropriate adaptations were made in studies of mindfully listening.

When others are speaking in a dialogic conversation:
- I monitor the eyes of the speaker
- I show my respect for the speaker
- I express my opposition verbally and nonverbally to unethical speech
- While listening to others my nonverbal actions project compassion and empathy to the speaker
- When a speaker says something with which I disagree I try to learn from the difference
- I make sense of the speaker's facial expressions of emotion
- I make sense of the speaker's gestures
- I nod my head as a sign of attentiveness
- Following each utterance, I provide an appropriate pause to ensure that the speaking turn is finished
- When necessary I seek clarification of the meaning of an utterance
- When necessary I request elaboration so as to expand the meaning of an utterance
- When necessary I check my understanding of what has been said
- I ensure that my nonverbal actions do not breach the fluency of what is being said
- I use nonverbal actions to provide emotional synchrony with spoken text
- I ensure that my emotional response to spoken text does not stick and create difficulties in understanding subsequent utterances
- I listen for similarities and differences to what has been said previously
- I look for similarities and differences in the meanings represented verbally and nonverbally

INTERVENING TO BENEFIT PARTICIPANTS

Just as we defined wait time as an intervention in research I began in 1973, so too can we use what we are learning in a study to design interventions for the purpose of learning more and benefiting participants. For example, when we learned that changes in blood oxygenation changed prosody of a teacher’s voice, thereby providing a vehicle for emotional contagion, we used breathing meditation as a way to stimulate activity of the “smart vagus” nerve and thereby to harmonize blood oxygenation, pulse rate, blood pressure, body temperature etc., making it possible to express emotions prosodically and facially (Porges 2011). This intervention allowed Donna King to use breathing meditation to improve the quality of her teaching and to thereby change critical features of the learning environment (Tobin, King, Henderson, Bellocchi, and Ritchie 2016). Similarly, in our ongoing work the question arises about breathing while talking. Is it desirable and even possible to breathe through the nostrils while speaking? If the answer is that it is
possible and desirable, then an initial inquiry concerns whether breathing through the nostrils involves both nostrils equally – or is there imbalance? Foci such as these, or perhaps I should say issues, arise continuously and become part of the authentic inquiry that characterizes our work.

It is important to note, in regard to doing research, that theories used to frame research are akin to search lights – they illuminate parts of an otherwise darkened landscape (Tobin 2008). As theories change we can see social life differently, new data sources become salient, and methodologies change to credibly answer what is happening, why is it happening, and what more is there.

**RIPPLE EFFECTS**

As participants heighten awareness, change practices and values, and notice that different forms of culture are being enacted, it is possible that what they do in the moment changes, not only in the fields that are constituents of the research, but also in fields throughout the lifeworld. If and as this happens the interactions with others, throughout the lifeworld, will be different than they would otherwise be. These differences can catalyze new forms of cultural enactment than otherwise would occur. Accordingly, participants in the lifeworld will act differently, in interactions with research participants, than otherwise would be the case. These changes, like all enacted culture would be both aware and unaware. We refer to cultural changes like these as ripple effects – catalyzed by participation in research (Tobin 2009). A cautionary note is that not all changes will be desirable, beneficial, and emancipatory. Accordingly, there is a strong case for research participants using reflexive practices in different fields of the lifeworld to heighten awareness of enacted culture and particularly what are salient findings from what we have learned from our research.

Ripple effects, as a constituent of authentic inquiry, also are a component of an expanded view of generalizability. Importantly, beneficence is a key criterion in assessing the extent to which what has been learned from a study is appropriated and enacted. We can look beyond the participants in a study to document beneficence and ensure that, when they occur, ripple effects are noted and associated beneficence becomes part of the research.

**EVENT-ORIENTED INQUIRY**

We were challenged by ways to select from a large reservoir of resources that might be analyzed in our research. We tried numerous approaches, usually privileging the perspectives of one or more stakeholder groups. When we obtained a copy of Sewell’s 2005 book, we became aware of his use of event in historical research (Sewell Jr. 2005). He studied events in macro situations, such as the French revolution. We appropriated this idea in our multi-level analyses in which we identified related events to analyze at macro, meso and micro levels.

We regarded an event as a spike in the curve, a departure from what was expected (Tobin and Ritchie 2012). Accordingly, events are transformative in the sense that structures that are unanticipated are involved in production that is both
reproductive and transformative. The spike in the curve is itself unexpected, and thereafter interactions reflect the spike as well as actions that align with the previous trajectory of cultural production. Given our multi-level approach to doing research, we can look for spikes, or salient contradictions at micro, meso, and macro levels. Consideration of two examples can clarify how the methodology has been employed in recent studies.

An Example of Effective Learning

In a collaborative study in which Michael Roth and I studied coteaching, science teacher education, and urban education (Roth and Tobin 2010), Victoria was coteaching a class on chemical valence with two others, who were working one-on-one with individuals as she presented to the whole class. As Victoria was explaining valence in terms of the periodic table, a student, Mirabelle, began to speak, asserting that she knew how to make sense of the patterns in valence and electronic structure. Reluctantly, Victoria surrendered the floor to Mirabelle, who confidently began to explain her theory to the teacher and her peers.

The vignette, which consisted of Mirabelle’s explanation and her subsequent interactions with Victoria and peers, was selected by student researchers as an example of good learning. Although Mirabelle did not have a correct explanation, she stuck to her guns, showing exasperation when she could no longer fluently provide a lucid explanation that made sense to her. Essentially, we used narrative to describe the vignette and a variety of frameworks and associated methodologies to analyze what was happening and why that was happening.

We examined interactions using Randall Collins theory to find evidence for mutual focus, synchrony, asynchrony, entrainment, collective effervescence, and solidarity (Collins 2004). This analysis involved frame-by-frame analyses of a video file for the event. We studied eye gaze, head orientation and movement, and movement of the body (torso, head, arms, hands, fingers etc.). In one case, we measured the frequency of a person’s leg movement as he appeared to tune into the rhythm of the class, looking for an opportunity to break into the conversation by taking a turn of talk. Also, we examined prosody to identify patterns associated with intensity of the sound wave in the air, pitch of the sound wave, and prosodic bridges between speakers and within utterances. To do this we used video and audio files from the video clip of the vignette.

In this extensive, multilogical, multi-level study we also used conversation analysis in what was a comprehensive set of analyses that transcended micro and meso levels of social life. In our interpretations and aggregations of what we learned from this very detailed study, we wove in macro level schemas as interpretive frames, using a sociocultural framework that illustrated the power of event-oriented inquiry.

Teaching with Low Blood Oxygen

In a lesson taught by Donna King, she wore a finger pulse oximeter, providing us with a window into aspects of her physiology including blood oxygenation and pulse rate (three measures per second). We were able to synchronize these data with recorded video and audio files of the lesson. Accordingly, an immediate challenge was what to study. When we looked at the physiological data we saw spikes in the blood oxygenation and pulse rate curves. For example, we wondered what teaching would be like when blood oxygenation levels spiked downwards to reach a level of 92%. We identified an event defined by the minimum blood oxygenation levels, bounded by a beginning and end when blood oxygenation was 98% -- normal for Donna. We then clipped the video and audio corresponding with those particular changes in pulse rate; so that we could see what was happening during the event. Events were identified also for high blood oxygenation, high pulse rate and low pulse rate. Then, for each of these events we undertook multi-level, multilogical analyses that included conversation analyses, prosody, proxemics, conversation analysis, and narrative. A novel aspect of this study was use of polyvagal theory (Porges 2011) to focus data resources and interpretive frames. Once again, multi-level, multilogical event analysis was powerful and provided very important understandings that have strong implications for the wellbeing of youth and teachers.

PUSHING THE BOUNDARIES OF MULTILOGICAL RESEARCH

It was not considered ethical for us to study emotions, find that excesses of emotion are associated with serious health projects, and fail to intervene to improve wellbeing of all participants. Accordingly, I set out to identify how Traditional Chinese Medicine treated an excess of emotion (Kaptchuk 2000). I concluded that reflexology was a promising practice that might have simple touches, holds, and massage techniques that could be used in a toolkit to ameliorate emotions. A colleague from Singapore suggested I consider an alternative medical art called Jin Shin Jyutsu (JSJ), otherwise known as soft touch therapy (Burmeister 1994), to ameliorate unwanted excesses of emotion. The advantages of JSJ over reflexology were numerous. JSJ involved harmonizing the flow of universal energy, Qi (Beinfield and Korngold 1991), through the body and, importantly, there were finger holds that directly harmonized emotions, including worry, fear, anger, sadness, and try too hard. In addition, JSJ was administered to people fully clothed, self-help techniques were abundant and relatively easy to do, and the touches, holds and sequences involved light touch – hence no pain.

Jiro Murai and Mary Burmeister were the primary developers of JSJ in the early to mid-twentieth century and thereafter. The core knowledge base was recovered from traditional medicine originating from regions in and around India, transferring to Japan and other parts of Asia before becoming lost, with the rise of Western technologies and canons. Murai undertook empirical research with humans and other animals to trace Qi flows through the bodies and to identify sites for blockages, diversions, and other disharmonies. Based on the emerging empirical work and associated understandings, procedures were developed and tested for restoring harmony in the Qi flows of the body. Disharmonies catalyzed health projects,
which could develop over time to manifest as major-label health issues, such as cancer, diabetes, and arthritis. Regular, strategic use of flows (i.e., sequences of light touches and holds on the body) could regenerate good health.

JSJ theory postulates 26 safety energy locks (SELs), sites at which Qi can be blocked and diverted. Detecting where energy is blocked or otherwise is flowing inappropriately, can be an initial step in using JSJ to address health projects. From the perspective of our research on teaching and learning, there are holds that teachers and students could use to ameliorate unwanted emotions. For example, if students were worried they could lightly hold their thumbs (i.e., first the left and then the right). Figure 1 shows the locations of the 26 pairs of SELs.

Our group has been extensively involved in educating friends, colleagues, and others who hear about our work with JSJ and its applications to wellness. These requests for knowledge span the birth through death spectrum and include relief from everyday health issues such as allergic reactions that manifest as skin, itches, and blemishes, nasal drips, sneezing, coughing, and diagnosed consequences such as adenoid hypertrophy, whereby a doctor concluded that continued allergic reaction catalyzed inflammation of a child’s adenoids. Other frequent issues are related to hip, knee, and foot, muscles and joints, and stress—especially headaches. The focus is often household pets, and most recently I spoke to anxious owners about how to assist their 14-year-old dog that had hip problems with associated difficulties walking. In this case they were concerned with the dog’s comfort and a tendency of their Vet to over-medicate.

My call for science educators to address citizen education regarding wellness is complicated by seeming lack of respect/trust for knowledge systems grounded in theories of universal energy; preference for a monolingual approach based on Western Medicine, and failure to recognize and acknowledge strengths of multilogicality. Frequently, when I suggest JSJ as a possible solution to a health project, those who hear my suggestions regard it as alternatives to Western Medicine rather than complements to it. To some degree this is further evidence of crypto positivism and a malicious side effect of scientism. Labeling complementary medical knowledge systems as quackery is a factor that serves as a deterrent to understanding complex relationships that underpin social life—including how living things sustain wellness in the moment, and how they might be educated, reflexively, to employ toolkits to address health projects if and when they arise. There is ample evidence, every hour, that humanity cannot cope well with difference, and it seems evident and paramount that we need to broaden citizen education so that citizens can “know themselves” in ways that expand agency and facilitate self-help and helping others to sustain productive lives that benefit well-being across all ecosystems.

Since this chapter has an autobiographical character, I conclude with a personal perspective. The JSJ issue I just referred to is familiar. When we moved toward interpretive research it felt like swimming against the tide, and when radical constructivism was proffered as a viable way to think about learning and knowing,
there was a violent backlash from mainstream educators. Similarly, when we advocated for and adopted a sociocultural foundation for science education and viewed learning as cultural production there was a tendency to marginalize and ignore. Based on my lived experience, resistance from mainstream is a familiar part of being in the world – a familiarity that is uncomfortable for many reasons – not the least of which is that monosemia, failure to respect and learn from difference, and scientism may be contributing to growing malaise that has infected political and other fields of social life, creating a gloomy specter for what is ahead. If research in the social sciences is to make a difference and earn respect of the world community, there is dire need for change, collaboration, and acknowledgement of difference being a resource for transformation for a sustainable future.

REFERENCES


AUTHENTIC INQUIRY


AUTHOR BIOGRAPHY

Kenneth Tobin came to the Urban Education doctoral program at the Graduate Center of CUNY in the fall semester of 2003. Presently he is coordinator of the Learning Sciences strand. Prior to his position at the Graduate Center Tobin had positions as tenured full professor at Florida State University (1987 to 1997) and the University of Pennsylvania (1997 to 2003). Also, he held university appointments at the Western Australian Institute of Technology (now Curtin University), Mount Lawley College and Graylands College (now Edith Cowan University).

Before Tobin became a university science educator in Australia in 1974, he taught high school physics, chemistry, biology general science, and mathematics for 10 years. He began a program of research in 1973 that continues to the present day – teaching and learning of science and learning to teach science.
Figure 1. Jin Shin Jyutsu’s 26 Safety Energy Locks

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