

**Studying the Over-time Construction of Knowledge in Educational Settings:
A Microethnographic-Discourse Analysis Approach**

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In the last six decades, researchers within and across disciplines have sought to develop theoretically grounded approaches to investigate and theorize complex and developing social, communicative, and academic experiences of learners as they engage in local and situated *cycles of activity*, in and across times, events, and configurations of participants in formal and informal educational contexts. Many of these developing lines of research have sought to provide ways of achieving the calls of *Review of Research Education* (RRE) editors to *reconsider long-accepted findings, the nature of data and analysis, and existing theoretical frameworks and paradigms*.

Today, as evidenced by this call, the process is ongoing.

The challenges facing researchers seeking to address this call were captured by a set of international dialogues over the past two decades. For example, Candela, Rockwell & Coll (2004) report on dialogues over three days among thirty-five international scholars, guided by a range of theoretical perspectives and methodological processes, who were asked to address: *What in the world happens in classrooms from qualitative research perspectives?* Each participant brought a history of ongoing research focusing on classroom processes and practices that shape socially, culturally, linguistically and academically diverse students' opportunities for learning in classrooms in different national contexts.

Given this diversity of perspectives and methodologies, Candela et al. urged participants to explore potential common understandings of learning in classrooms and the possibility of interconnecting their lines of research. This request led to a series of unanticipated challenges:

We faced the initial difficulty of defining what 'classrooms' are, have been, or will become. This led to a discussion of the various links between classrooms and their social contexts, which posed the problem of working on various spatial and temporal scales. The topic of learning was a constant preoccupation, as we considered that researchers still lack tools to connect specific teaching practices with student outcomes over time, and simultaneously to account for learning in other, non-classroom spaces. (p. 692)

They further framed an analytic problem of methodological actions in past research in the following way:

There was agreement that studies focused on the 'play-script transcript' version of fragments of teacher-student interactions do not exhaust the complex nature of classroom

activities and processes, as has already been shown in a variety of studies.¹ Focusing on classrooms, while also reconstructing within them the influence of processes from the surrounding world, became one of the challenges of a new research agenda. (p. 693)

These challenges also pointed to the need for transparency in presenting the logics-of-inquiry guiding lines of research.

In 2006, after a two-year development process that included a taskforce and public debates, the American Educational Research Association (AERA) recognized the need for transparency in reporting the logic-of-inquiry guiding a research process by publishing the Standards for Reporting Empirical Social Science Research in AERA Publications². These standards framed a research *logic-of-inquiry* as follows:

... reports of empirical research should be transparent; that is, reporting should make explicit the logic of inquiry and activities that led from the development of the initial interest, topic, problem, or research question; through the definition, collection, and analysis of data or empirical evidence; to the articulated outcomes of the study... These standards are therefore intended to promote empirical research reporting that is warranted and transparent. (p. 33)³

The arguments framed in this introduction provide a foundation for our approach to presenting

¹ Although Guthrie & Hall (1983) did not state which studies had addressed these issues, issues arguing that data are not found are framed by Ellen, 1984; Clifford & Marcus, 1985; Cole & Zuengler, 2007. This argument includes issues of how to transcribe social and cultural events and actors (Bucholtz, 2000), given different theoretical traditions of discourse analysis. For contrasts among different theories of discourse and conversation analysis in classrooms, see McDermott, R.P., Gospodinoff, K. & Aron, J., (1978); Heap (1995); Cummings, & Wyatt-Smith, 2000; Wyatt-Smith & Cumming, 2001; Blommaert & Jie (2010); Rampton, Maybin & Roberts (2015), Rex, Steadman & Graciano, 2006; Markee 2015).

² Three years later, 2009, AERA published Standards for Reporting on Humanities-Oriented Research in AERA Publications in the Educational Researcher

³ For a contrastive analysis of the *Status of Claims* associated with different research traditions, see Heap, 1995.

the microethnographic-discourse analytic (ME/DA) logic-of inquiry that has guided studies in classrooms at different levels of schooling as well as in different disciplines and (inter)national contexts. In this chapter, we will make transparent the theoretical, epistemological, methodological, analytical and reporting processes and practices that guide the logic-of-inquiry of ME/DA as an epistemology.

Goals for Presenting ME/DA as an Emergent Logic-of-Inquiry

Our goals for presenting this microethnographic-discourse approach (ME/DA) are two-fold, given that ME/DA is an interdisciplinary logic-of-inquiry that has developed over the past four decades through contributions of a growing range of international and interdisciplinary researchers and educators.⁴ Our first goal is to present an analytic review of two seminal reviews of literature published in the first decade of the *RRE*, which frame theoretical and methodological developments of microethnography (Smith, 1978) and the functions of language in classrooms with diverse learners (Guthrie & Hall, 1983).

Through this process, we identify how ME/DA is situated in these historical and developing lines of research. Additionally, we will make transparent to readers new to these lines of inquiry, as well as to experienced researchers, what has been learned about ethnographic and discourse lines of research from these two historical reviews.

Our goal in taking this approach is to make transparent a process that ME/DA researchers have undertaken an *if...then...* logic. This epistemological process, as we will demonstrate,

⁴ For conceptual developments in microethnographic-discourse analytic studies of classroom interactions and their consequences in different educational spaces (e.g., Green & Wallat, 1981a; Gilmore & Glatthorn, 1982; Bloome, et al, 2005; Rex, 2006; Bridges, Green, Botelho & Tsang, 2015; Green & Castanheira, 2019; Kelly & Green, 2019; Bloome, Newell, Hirvela, Lin, Brady, Ha, Swak, Seymour, Thanos, VanDerHeide & Wynhoff Olsen (in press). For conceptual review articles on microethnography that situates ME/DA research see, Garcez (2008; 2017); Spindler & Spindler (1982; 2000); McCarty (2005; 2014); Street (1984; 2005; 2013); Green & Bridges (2018).

supports an exploration of the relationships among theories, epistemologies and methodologies that frame particular actions central to constructing warranted accounts of learning as a communicative (discourse) and social process in classrooms (Heap, 1985; 1995).

By engaging in an *if...then...* logic-of-analysis, as we analyzed conceptual processes and theories inscribed by Smith (1978) and Guthrie & Hall (1983), we identified theoretical and methodological arguments to explore how they relate to, and inform, the developing ME/DA logic of inquiry presented in this chapter. We asked ourselves the following inter-related set of questions: *if we take this theoretical perspective or methodological process, then what are the conceptual perspectives we need to consider in our own research? What actions in the conduct of our research does this entail? How do these theoretical and methodological processes identified relate (or not) to those guiding the developing ME/DA logic of inquiry? And finally, how do they inform the conduct of ME/DA research in different disciplinary and social contexts in and out of schools?*

The *if-then* approach also demonstrates a conceptual stance central to ME/DA research, whether in situ, in constructing data sets from archived records, or in reading the published work of others (Skukauskaite & Grace, 2006; Green et al, 2015). This stance is framed by Heath (1982) as *stepping back from ethnocentrism*; that is, *stepping back from the known* to learn from others' perspectives, a stance that guides an anthropological approach to ethnography, and thus to ME/DA (see also Heath & Street, 2008; Green et al., 2012; Green & Castanheira, 2019).

Our second goal is to present two *telling case studies* (Mitchell, 1984) of how a ME/DA logic-of-analysis was undertaken by two researchers (Kelly and Baker, contributing authors to this intergenerational author team). Through the (re)presentation and (re)examination of the decisions and actions that Kelly (Kelly, Crawford & Green, 2001) and Baker (2001; Baker &

Green, 2007) undertook in their micro-ethnographic-discourse analytic studies in two different, discipline-based secondary Advanced Placement classrooms (Physics and Visual Arts), we demonstrate how the ME/DA logic-of-inquiry informed an *iterative, recursive* and *abductive process of analyses of opportunities for learning* afforded to, and being constructed by members of these two classes.

Our adoption of the *telling case studies*⁵ is grounded in theoretical developments in social and linguistic anthropology that have informed members of the ME/DA research community in the past four decades.⁶ Underlying the adoption of *telling case studies* is the following argument by Mitchell (1984), who defined anthropological *case studies* as

...the detailed presentation of ethnographic data related to some sequence of events from which the analyst seeks to make some theoretical inference. The events themselves may relate to any level of social organization: a whole society, some section of a community, a family or an individual. (p. 238)

In this argument, what becomes evident is the of goal *telling case studies*, from an anthropological perspective, is the construction of theoretical understandings of how actors in particular social contexts draw on and/or make present to others local and situated processes and practices as they engage in particular events in and across times with particular configurations of participants.

⁵ For discussions of different conceptual and philosophical perspectives on case study research in education, see Harrison, Birks, Franklin & Mills, 2017.

⁶ The roots include theoretical arguments grounded in social and linguistic anthropological theories of Bateson (Brockman, 1977; Birdwhistell, 1977); Geertz, (1982), Spradley (1980/2016), Ellen (1984); Street, 2005; Agar (1994; 2006 a; b), among others. Within educational research, we draw on conceptual developments in linguistic and social anthropology, and ethnography of communication framing microethnographic research in schools and communities (e.g., Hymes, 1972; 1982; Gumperz, 1981; 1982; 1986, Trueba & Wright (1981); Heath, 1982; 1983; Gilmore & Glatthorn, 1982; Egan-Robertson & Bloome, 1998; Erickson, 2004; Sheridan, Street & Bloome, 2000; Bloome, et al, 2005; Rex, 2006; and Heath & Street, 2008.

By tracing actions of particular actors and analyzing the sequence of events through particular theoretical lenses, anthropologically guided ethnographer seeks to develop valid connections among actions, objects, actors, and activity to construct theoretical understandings of what is being interactionally, socially, discursively and situationally accomplished by participants. The process that the ethnographer engages in, therefore, is one of *analytic induction* (not deduction, i.e., a priori defined phenomena); that is, by undertaking a set of analytic processes, the ethnographer seeks to make theoretically valid (i.e., grounded) connections between and among the phenomena analyzed (Corsaro & Heise, 1990).

This definition of case studies, as *telling cases of analytic induction*, therefore, frames goals of ME/DA researchers as well as how they *bound units of analysis* and *make theoretically valid connections* between and among phenomena of classroom life that are the focus of such research (Heath & Street, 2008; Green et al., 2012). This conceptual process, as we will demonstrate through these two *telling case studies* by Kelly and Baker, supports analysis of what constitutes a process of *analytic induction* of what is being constructed in the moment-by-moment and over-time discourse, and interactions of students with their teacher in purposefully designed cycles of activity at different levels of scale.⁷

In taking a telling case approach, we also seek to address one additional set of challenges identified through international conversations that this chapter addresses. In ongoing dialogues undertaken over ten years Kumpulainen, Hmelo-Silver, and César (2009) and researchers from AERA and EARLI (European Association of Research on Learning and Instruction) identified

⁷ For studies focusing on different sites, levels of human and time scale, and phenomena of interest from a common logic-of-inquiry, see Castanheira, Crawford, Dixon & Green, 2000; Rex, 2006; Carter, 2007; Newell & Bloome and the Argumentative Writing Project, 2017; Bloome, Castanheira, Leung & Rowsell (2019), and Kelly & Green (2019). For explorations of the theories guiding ethnographies across national borders in Latin America, see Anderson-Levitt & Rockwell (2017).

the following challenge facing researchers seeking to undertake new and developing research studies in classrooms:

What has become clear among the research community is that although great accomplishments have been achieved in research on social interaction in learning and instruction, we still lack a coherent understanding of how methodologies illuminate learning and education as a social process and also how these conceptual tools “work” in empirical studies ... [and that] there is a need for opportunities to discuss and demonstrate how these methodologies are used, how they become alive in the actual research studies of classroom interaction. (p. 1)

Through the telling case studies approach, we will make transparent how the exploration of what was happening in the two Advanced Placement classes (not classrooms) required *iterative*, *recursive*, and *abductive logic-of-analyses* guided by a ME/DA logic-of-inquiry.

The first telling case study (re)constructs the logic-of-analysis that Kelly developed (i.e., a ME/DA logic-in-use) to examine how students in four self-selected groups interpreted and undertook a guided physics assignment in a high school Advanced Placement Physics Lab (Kelly et al, 2001). The second telling case study (re)constructs Baker’s analyses of how students in an intergenerational (grades 9-12) Advanced Placement Studio Arts class, with students who had participated from 1-4 years (Baker, 2001; Baker & Green, 2007), engaged in learning studio art processes and practices.

These telling cases studies also make transparent how the *analytic logic* constructed by these researchers supported their investigations of how and in what ways particular learning processes, practices, and conceptual knowledge were introduced to, and constructed with, students in these classes. By holding the level of schooling (secondary education) constant, and

varying the academic area of study (Physics and Visual Arts), we seek to make transparent how ME/DA, as a logic-of-inquiry, can be undertaken to examine social, epistemological and communicative processes, practices and conceptual systems in different educational contexts (Kelly, 2016a; b).

Analysis of Foundational Reviews of the Roots of

Microethnography and Functions of Language in the RRE: 1973-1983

In this section, guided by the arguments about transparency in reporting perspectives presented above, we trace roots of core principles guiding microethnographic and discourse lines of research that were introduced by Smith (1978) and Guthrie & Hall (1983) in the first decade of the *RRE* (1973-1983). These historical reviews provide a foundation for understanding the roots of, and thus situating ME/DA in the theoretical and methodological developments of studies of the social construction of learning in classroom contexts.⁸

To step back from our current understandings of the lines of research known as microethnography and discourse analysis, we posed the following questions of Smith (1978) and Guthrie & Hall (1983):

- How and in what ways did the author(s) bound the review?
- What actions and conceptual perspectives were inscribed in the research identified?
- What issues were raised through the review process to inform readers about challenges and issues to consider in engaging in a particular research logic-of-inquiry?

⁸ For a three-decade review that complement these seminal reviews, see Ball (2002) and subsequent reviews in the next two decades of the *RRE*.

- What directions for future research were identified?

Through this analytic process, we also investigated challenges or methodological concerns raised by these authors that we then triangulated (Denzin, 1978; Green & Chian, 2018) with actions, theories, and processes of the ME/DA logic-of-inquiry.

Smith (1978) and the Roots of Ethnography/Microethnography in Education

In his chapter entitled “An Evolving Logic of Participant Observation, Educational Ethnography, and Other Case Studies,” Smith (1978) frames his goals as follows:

...to provide a context and logic for the discussion of the genre of research that is becoming known by such varied labels as educational ethnography, participant observation, qualitative observation, case study, or field study. (p. 316)

We identified a challenge facing researchers in this early period that converges with challenges presented in the introduction to this chapter. Smith (1978) argued that although there was an emerging body of research across different traditions, there were limited understandings of the processes involved in the *evolving logic of participant observation* and other ethnographic processes or phases of research.

Therefore, in this section, we focus on the roots of theoretical and conceptual processes that Smith identified as central to engaging in ethnographic research by 1978. The researchers identified were guided by different conceptual traditions⁹ grounded in anthropological and sociological perspectives on ethnography. The researchers identified included educational ethnographers as well as scholars in other social science disciplines. The lines of research in education identified by Smith focused on different dimensions of education as a social

⁹ The work inscribed in Smith is primarily grounded in US contexts of ethnography. For sociological and international perspectives see: Heap, (1985); Atkinson, 1990/2014; Walford, 2008; Beach, (2017); Skukauskaite, Rupsiene, Player-Koro & Beach (2017); Anderson-Levitt & Rockwell (2017).

phenomenon: *Schools and communities* (e.g. Spindler, 1963; Wolcott, 1967), *school and interorganizational educational systems* (e.g., Lutz, 1962; Smith, 1977), *schools* (Rist, 1973), *classrooms* (Smith & Geoffrey, 1968; Cazden, John & Hymes, 1972; Rist, 1973 and Delamont, 1976), and *curriculum and program evaluation* (e.g., Smith & Carpenter, 1972), among others.

He further argued that, although these studies constituted a growing body of work, there was a parallel body of work focusing on what was entailed in engaging in *participant observation*. The processes identified at the time (1978 and earlier) were based on reflexive processes, represented by what he framed as the researcher's "creative processes in learning from a fieldwork project" (p. 229). This state-of-affairs, he argued, required further exploration to make transparent what constituted this social science approach as a methodology. To support this argument, Smith identified phases of ethnographic studies that he and others had experienced:

- Identifying origins of the problem
- Identifying major seminal bodies of work that frame methodological processes and issues
- Developing awareness of competing theories
- Identifying multiple phases required in designing and engaging in a study
- Developing guiding models and theories
- Constructing ways of recording the researcher's thinking, decision-making and interpretive asides during phases
- Engaging in conscious searching of records to construct data and literature to inform analyses as well as interpretation of records and analyses

Smith also introduced what he framed as "*new ethnographies*" that shifted the focus from a more holistic study of a group or community to analyses of audio and video tapes of classroom events, a direction that he framed as *microethnography*.

This argument foreshadowed Mitchell's (1984) arguments about multiple ethnographic studies that focus on different levels and participants in societies. Smith's chapter also foreshadowed Agar's (1994; 2006a) argument of ethnography as an *iterative, recursive*, and

abductive process, in which decisions are made throughout an ethnographic study. This process, Agar (2006a) argues, requires the ethnographer to *step back* and begin to trace the pathways leading to, and roots of, the processes being experienced by the ethnographer (and participants) to develop a grounded understanding from the *point of view of participants*, i.e., perspectives -- not *perceptions*, of the insiders (participants in the event).

As part of his presentation of processes and practices in the conduct of ethnographic inquiry, Smith (1978) identified ways of framing decisions in phases of analyses and writing. The following sets of decisions and actions also frame a process of transparency in reporting on the conceptual decisions guiding the researcher's *logic-of-inquiry* that we drew on in the two telling case studies that follow:

- Make transparent how “the case” is an instance of a class of events.
- Present an initial overview of the process of analysis.
- Describe the process of concept formation.
- Describe how outliers (to a set/class of events) were addressed.
- Present a discussion of ways of clustering multiple dimensions identified in participant observation and analyses.
- Describe data level(s) that raise issues of access.

As indicated in these actions, a key issue Smith identified was the need to define *what constitutes a case* within a class of events; that is, what the case is a *case of* (e.g., a color, an action, a place for particular actions, among others), and what will be included as an instance of a particular phenomenon.¹⁰ He indicated that the ethnographer needs to consider *outliers* that are beyond the set of cultural processes in a particular class of phenomena (a set of cases), and what issues outliers raise for reporting on the different classes (sets); that is, *what is included* and *what is not*, and *what questions* outliers raise about the claims being made.

¹⁰ See Spradley, 1980/2016 on semantic relationships, domain analysis, and taxonomic construction.

Smith also included *concept formation as a process*, and thus framed a conceptual argument that an ethnographic approach does not start with, nor is limited to, what is observed and analyzed in predefined (*a priori*) ways based on prior research. Rather, this process involves a principled approach to *clustering* multiple dimensions, which were identified through an in time and over time analysis of such phenomena. This process Smith further describes as involving *multiple levels of data construction at different levels of analytic time and social scale*. Through different forms and levels of analyses, Smith argues ethnographers construct *classes* (i.e., sets of phenomena) and develop ways of *clustering* them to build warranted accounts of phenomena and processes being studied.

In examining the *issues and directions* Smith inscribed, our authorial team identified the importance of making transparent what counts as access to particular educational sites, and how access is (re)negotiated with particular actors at particular levels of an organization. Smith argued that if there are limits to access, then the data presented are suspect. His review also led him to conclude there is minimal overlap in reference citations across research traditions focusing on observation in classrooms as well as language related to school performance, a point also made more than two decades later by Candela et al (2004) and Kumpulainen et al. (2009).

Readers of Smith's chapter, therefore, are afforded a unique opportunity to develop a deep history of ethnographic inquiry in education and other disciplines, which makes visible differences among: ethnography *of* education undertaken by researchers in other disciplines; ethnography *in* education undertaken by educational researchers to address relevant areas to educators; and ethnography *for* education designed to support transformations in education to address issues of equity of access for diverse learners (*cf.*, Green & Bloome, 1997; Bloome, Beauchemin, Brady, Beuscher, Kim & Shey, 2018).

Guthrie and Hall (1983) on Functions of Language in Classrooms

We selected Guthrie & Hall for two reasons: first it provides a four-decade review (1950-1983) that parallels the history of ethnographic research by Smith (1978). Like Smith, Guthrie and Hall (1983) examined developing theoretical and methodological directions central to studies on how language functions to support and/or constrain learning in classrooms with linguistically, culturally, socially and academically diverse students. Second, Guthrie and Hall complement and expand Green's (1983) RRE review of 10 National Institute of Education (NIE) funded studies of how language use in classrooms and other education settings was supported and/or constrained by actions of teachers with students as well as how students learned academic and social processes in classrooms (Cazden, John & Hymes, 1972; Gage, 1974; Cazden, 1986; 1988; 2017). The lines of research Guthrie & Hall (1983) inscribe in their review are central to understanding microethnographic studies in the 1960s-1980s, and the ME/DA logic-of-inquiry underlying Kelly's and Baker's telling case studies that follow this section. They also link this developing line of research to perspectives on ethnographic research identified in Smith (1978) as (re)presented in the following:

One approach to the study of children's language use in and out of classrooms has been known variously as microethnography (Erickson & Shultz, 1977, 1981), constitutive ethnography (Mehan, 1979), or ethnographic monitoring (Hymes, 1981). There are other types of research labeled microethnography, notably the method devised and employed by Smith & Geoffrey (1968), and Rist (1973). However, here we are concerned with the system of microethnography incorporating a sociolinguistic perspective and focus. (p. 64)

In Table 1, we present a detailed description of key concepts and processes Guthrie and Hall identified at the intersection of microethnography and sociolinguistics, concepts central to the telling case studies by Kelly and Baker presented in the next section of this chapter.

[insert table 1 here]

As indicated in Table 1, the concepts presented frame how social interaction, as a multi-dimensional phenomenon, like language (cf., Halliday, 1973), can be characterized as a set of options (Gumperz 1972). From their perspective on interaction, Guthrie and Hall (1983) frame the following:

In the mutual construction of their discourse, actors select what they want to say next (semantic options), how to say it (social options), and the form it will take (linguistic options). They even exercise options about what to attend to, how to interpret their environment, and how to define what is going on. At the basis of these choices is a series of factors that can act as constraints. At the most general level, these include social and cultural facts such as social status and cultural norms. At the most-narrow level are facts that are within the interaction itself, such as prosodic and phonological variations. (p. 59)

They further argue, constraints also operate at the local level and that these constraints (e.g., norms and/or rules for participation) are always in context. These levels of constraint do not act in isolation; rather, they are interdependent and mutually interacting and experienced in terms of situation, social context and task. Moreover, “The influence of any constraint depends on the actor’s consciousness, which lies at the center of all social interaction” (p. 61).

If we extend the conceptual arguments about language and interaction (re)presented in Table 1, *then* it becomes important to consider what influences how students will interpret what is being proposed to them in and through the interactions, as well as how they interpret what is

required to participate (Green & Wallat, 1981b; Gumperz, 1981; Bloome & Egan-Robertson, 1993; Bloome, Carter, Christian, Otto & Shuart-Faris, 2005). Thus, in Table 1, we (re)present core constructs that are central to understanding why Guthrie and Hall (1983) frame the following *limits to research* focusing on particular moments in classrooms: “the complexities of human interaction are so great that one cannot, with confidence point to independent variables within a particular situation as having caused any observed differences” (p. 63).

In their chapter, therefore, Guthrie and Hall provide a rich review of conceptual arguments about how different researchers have theorized *language, interaction, contexts, social processes, consciousness, and personal interpretations*, among other human processes that influence what can be made available to and interpreted by (or not) students in and across times, events, cycles of activity and configurations of different actors. The challenges Guthrie and Hall raise converge with those framed by educational researchers presented previously and lay a foundation for understanding the decisions and actions that guided Kelly and Baker in the (re)examination and (re)presentations of their telling case studies demonstrated in the next section.

Telling Case Studies: Making Transparent ME/DA Analytic Logics-In-Use

As the telling case studies presented in this section will make transparent, the concepts and processes presented in both Smith (1978) and Guthrie & Hall (1983) are central to the ME/DA logic-of-inquiry. Additionally, they inform the iterative, recursive, abductive logic-of-analyses undertaken by Kelly and Baker.

Telling Case Study 1: Common Task, Uncommon Take Up

In this Telling Case Study, we describe the multifaceted and multi-level approach to analysis undertaken by Kelly and his team of sociolinguistic-based analysts (Crawford and

Green) to trace the ways students in his Advanced Placement Physics Lab were introduced to new technology-based processes. These laboratory processes were designed by Kelly to guide students' work in four small groups (teams) as they engaged in explorations of physics concepts and processes explained in more detail later. Thus, through this telling case study, we (re)construct the actions that Kelly took as designer and instructor of the laboratory experiences as well as researcher.

This telling case study (re)examines Kelly et al.'s (2001) original study that focused on identifying the actions, interactions, discourse and ways students negotiated the technology-oriented physics task. Kelly's goal for the original study was to develop understandings of how students constructed common knowledge (Edwards & Mercer, 1987; Mercer & Hodgkinson, 2008) of a physics problem and the epistemic processes and practices involved in undertaking the problem.

In order to *step back* from the presentation of different analyses undertaken by his research team, Kelly (re)analyzed the original published report (Kelly et al., 2001) to make transparent the logic-of-analysis that they undertook to examine how and in what ways each group of students engaged in the following actions:

- How students formed self-selected teams of 3-4 people;
- How each team interpreted the task;
- The ways in which each team engaged with the technology for collecting sources of data related to the physics problem inscribed in the guide constructed by Kelly in his multiple roles of designer-instructor-research team leader;

- How participants in the team negotiated what knowledge of physics was critical to accomplishing this task and whose knowledge was accepted (or not) as these AP students engaged with the problem over time.

As this telling case study will make transparent, to examine what forms of common knowledge as well as how common and individual knowledge was being proposed, recognized and taken up (or not) in the process of learning from the technology-enabled physics problems, Kelly and the sociolinguistic/microethnographic research team undertook multiple levels of analyses, including:

- Constructing multiple forms of transcripts to *map*, and thus create texts, that were then analyzed to seek evidence of how the developing task and events identified were being constructed by the different groups, in order to develop an empirical/grounded understanding of the group's interpretation of the developing tasks.
- Tracing student interactions, actions, and discourse to examine how and under what conditions, and in what ways, students proposed, and thus, displayed (or not) understandings of scientific knowledge and epistemic processes and practices.
- Engaging in contrastive analyses across groups that required different forms of (re)presentation of what was being constructed in and across times and interactions among members of each team.
- Developing theoretical understandings of what constituted common knowledge across groups as well as individual student knowledge and collective knowledge within groups.

Although these multiple levels of analyses were limited to examining one laboratory experience (1 day), Kelly's telling case study, with its close focus on developing segments of classroom life within and across groups, was designed to provide readers with an opportunity to

examine critical dimensions of the ME/DA logic-of-inquiry. It also creates a foundation for understanding studies in Kelly's larger program of research, which have been undertaken over the past two decades. This program of research has led to the identification of new and previously unexamined dimensions of processes in classrooms that shape students' access to, and understandings of, knowledge and epistemic practices of science and engineering within and across different levels of school and classroom contexts (e.g., Kelly, 2008a; b; Kelly, 2016a; Kelly & Licona, 2018; Kelly & Cunningham, 2017).

Situating the Physics lab study within and ongoing program of research

In this section, we (re)construct Kelly's logic-of-analysis to demonstrate how the analysis of micro-moments of interaction led to the identification of various ways in which the students sought to propose, communicate, evaluate, and legitimize knowledge claims in their small groups. Underlying these processes was Kelly's background in physics that led to the importance of examining how the local and situated processes and practices related to ways of knowing physics as a discipline.

This process involved multiple angles and forms of analyses in the original study, not only a single transcript analysis (Alexander, 2015). These analytic processes involved examining different phenomena as they were being constructed, including: *Analysis of teachers' discursive work; analysis of available texts (guide sheet) by student take up; analysis of student engagements with the technologies (i.e., computer probes using software that embody concretized physics and mathematics knowledge); and students' interactional and discourse processes within and across particular phases of the developing events of the lab session.*

In constructing this telling case study of his logic-of-inquiry, Kelly (re)analyzed the transcripts archived from his team's earlier work to further explore how the local and situated

epistemic practices were formed in this endogenous community, in ways that reflect the processes and practices of science communities in general. Specifically, through this (re)analysis, Kelly makes transparent how he, and his team, examined how the laboratory community (students, with their teacher) *constructed, extended, modified, and changed their understandings of the physical phenomena.*

Kelly's Logic-of-(re)Analysis of Epistemic Practices and Knowledge Construction

To establish the context and to make transparent the affordances Kelly created as designer and instructor of the laboratory experiences, we now foreground his goals of the design of this laboratory task for the Advanced Placement physics students. In this way, we make *visible* what is often an *invisible*, or unexamined context, in studies of teaching-learning processes, when studies solely focus on *what is happening in a particular event*, a concern that will be further explored in Telling Case Study 2 by Baker.

Kelly's goals for his design were grounded in his understanding of the epistemic processes and practices as well as conceptual knowledge of the discipline of physics: *to provide the students with opportunities to recognize the affordances of the real-time graphing capabilities of the computer-based laboratory, to create situations to encourage interpretation (that is, to "talk science") across different media, and to produce representations of physical phenomena.* The students were encouraged to make sense of the physical events (linear and oscillatory motion), through a series of verbal and written prompts (teacher lab guide sheet, student talk), symbols (real-time, computer generated graphs), and embodied motion (student imitation of motion through the physical movement of their hands).

Kelly engaged a discourse analysis team (Crawford and Green) to support the analyses of how students made sense of the science. Working together, this team produced a series of

timelines and transcripts that served as *graphic (re)presentations* of different dimensions of the social processes and epistemic consequences entailed in the students' actions and meaning-making processes. For example, the team created timelines (Figure 1, in this chapter --Figure 3, p. 144 in Kelly et al, 2001) to examine how four small student groups organized their time to accomplish the academic tasks framed by the teacher's lab guide sheet.

[insert figure 1 here]

Analyses of these timelines (a visual text of developing activity flow) provided a basis for examining the question: On what was time spent by whom and in what ways, leading to what progression of understanding of concepts and processes? This level of analysis, a *meso level* focusing on actions being undertaken, formed a foundation for *contrastive analyses* across groups, and thus for examining how the *common task*, was taken up *uncommonly* by each group. As Figure 1 demonstrates, this approach to contrasting a group's take up and engagement in this task, (re)presented as timelines, reveals the ways the students' initial thinking, false starts, and knowledge claims were embedded in sequences of activity. It also makes transparent how the time spent engaging in particular elements of the lab guide sheet differed across groups, leading to different potentials of future understandings of these physics concepts.

To examine the students' interactions at a more *micro-level*, the analysts created transcripts of talk and action (cf., Green & Wallat, 1981b; Green & Kelly, 2019) that (re)presented discourse beyond the speech mode. This approach to (re)presenting discourse and interpretive processes being proposed, recognized, and interactionally accomplished by participants, included: *recognizing and examining the signs and symbols used by students in the activities, the proxemics* (the distances between and among group members and artifacts), and *prosody* (pitch, stress, intonational contour, pause, and juncture) of *the conversations* (e.g.,

Gumperz & Herasimchuk, 1972; Bloome & Theodorou, 1988). Figure 2 (Kelly et al, 2001) provides an illustrative example of one of these transcript formats that supported multiple levels of analysis drawing on different inscriptions of discourse, configurations of participants, and the developing interactional processes.

[insert figure 2 here]

While a complete set of transcripts constructed and analyzed is beyond the scope of this chapter (see additional transcripts in Kelly et al., 2001), Figure 2 provides a focused exploration of how the analysis team created graphic texts that (re)presented particular levels of information that served to contextualize the discourse processes.

For example, Figures 1 and 2 (4 and 5, in the original publication) were designed to provide a basis for examining how the group came together and the sequences of decisions and actions leading to the production of knowledge claims and engagement in epistemic practices (Kelly & Chen, 1999; Kelly, 2016a). This level of sociolinguistic analysis was informed by the following microethnographic question: *How and in what ways were students engaging in and with the technology-generated texts as well as the actions and verbal/nonverbal interactions within the group?* Importantly, the transcription process in Figure 2 made it possible to identify the nonverbal communication, eye gaze, and the proxemics of the groups and thus their orientations to particular dimensions of the lab task (cf., Bloome and Theodorou, 1988; Gumperz, 1982; Green & Bridges, 2018).

In creating the text in Figure 2, the analysts, provide evidence of how this form of transcription created a foundation for exploring how participants' use of *reference* and *gestures* were critical to identifying the developing actions and texts being constructed by participants in

and across time and flow of activity in this developing event. By analyzing the video record *in concert with* this approach to transcribing, these researchers were able to develop *inferences about the referents* of the students' multi-modal (Gumperz, 1981) conversations at important *junctions in the conversations*. This analytic process, therefore, laid a foundation for examining the *complex meaning-making process* that involved the coordination of *words, symbols, and objects* as they were developing in and across phases of the group work.

Through the different levels of analysis of discourse and interactions, the analysts were able to develop an evidence-based narrative that traced the students' reasoning as they worked through the laboratory exercises. What these levels of analysis made possible to understand, and develop warranted accounts of, is that students working in the small groups did not always, or even often, come to a common interpretation without considerable discourse and interactional work. The analyses included ways that different members, within a particular student-group, reopened topics, a process that led the analysts to develop evidence of the variations in students' understandings of the physics topics. By examining key *referents to physics concepts* in the conversations by particular students across the groups, the analysts were able to identify the subset of students who articulated the canonical knowledge in the moment, and for whom resolution was achieved among the group members.

These figures and descriptions of actions of the research team made transparent how the ME/DA logic-of-analysis supported the team in identifying social processes of learning disciplinary knowledge of physics. Thus, in Telling Case 1, we presented a logic-of-analysis undertaken by Kelly et al. (2001) that made transparent how ME/DA, as a logic-of-inquiry and analyses, theoretically and conceptually, framed a multifaceted and multi-leveled approach to analyses to trace sources of common knowledge as they were being constructed (Edwards &

Mercer, 1987; Mercer & Hodgkinson, 2008) in and through the discourse, actions and understandings within and across groups (Guthrie & Hall, 1983).

The telling case study also provides evidence for the importance of reporting on how and why iterative processes of ethnographic analyses were necessary to *examine how knowledge claims were asserted, considered, tested, (re)formulated, and revised* by students in each group. This telling case study of the analytic processes undertaken by Kelly and his research team, therefore, framed the importance of an iterative, recursive, and abductive process central to tracing developing differences in the social construction of events and knowledge within and across groups. The research team thus engaged in epistemic practices of ME/DA to understand the ways that the students were learning through engagement in the epistemic practices of physics.

Telling Case Study 2: Analyzing the Social Construction of Studio Artist Processes and Practices

In Telling Case Study 2, we (re)construct the analytic logic-of-analysis that Baker (2001) undertook to examine how intergenerational participants (1-4 years in the program) were afforded opportunities to develop understandings of creative processes in an Advanced Placement high school Studio Art class. As in Telling Case Study 1, we present the logic-of-analysis for exploring opportunities for learning that raised additional analytic issues and for further demonstrating the iterative, recursive and abductive processes of the ME/DA logic-in-use. Specifically, we focus on developing a theoretical and empirical argument for the necessity of examining, an often-invisible mediating factor of classroom life: the developing histories and perspectives of students and teachers across times and events.

Through this (re)analysis of Baker's (2001) original study and subsequent studies (e.g., Baker & Green, 2007; Baker, Green & Skukauskaite, 2008), we unfold reflexive processes that Baker undertook through a multi-layered process of (re)analyzing archived records. In exploring Baker's reflexive analytic process, we identified a *shift* from his original focus on the teacher and the opportunities for learning she provided through her discursive actions, *to* a focus on the communicative processes of students with their teacher. In this way, Baker shifted from the role of *observer-as-analyst* to one of *hearer/listener-as-analyst* (cf., Bakhtin, 1986).

This shift in focus, as we demonstrate in this section, supported a (re)examination of the histories of class members, and their views on core discipline-based practices. Through this process, Baker raises questions about what an outsider (the researcher) may or may not be able to see, hear or understand (e.g., embedded social and disciplinary assumptions of particular classroom practices). By examining a key event from the two-year ethnographic study, the third cycle of *public critique*, we foreground how, in what ways, Baker identified discipline-based practices that were being constructed in the class (e.g., an iteration of *public critique*). Additionally, by examining the developing processes and practices for conducting and participating in this event, we demonstrate how Baker then engaged in a process of *backward mapping* (Agar, 2006b). His goal through this form of mapping was to identify sources of differences in the teacher's actions and discourse that shaped how she engaged students with different histories in successfully participating as artists in public critique.

Importantly, the telling case offers a second example of how the logic of ME/DA led a researcher to develop theoretically and empirically grounded claims about how the teacher—and, in this case, some of the experienced students—provided access to students for learning local disciplinary knowledge, processes, and practices. Specifically, we will (re)present layers of

analyses undertaken to examine roots of observed differences in two students' performance of *public critique*, a three-day event. This cycle of critique provided students with an opportunity to present a series of drawings to the teacher and peers, engage in a public conversation about the artifacts (i.e., drawings) constructed by each presenter, and to examine processes and practices used to construct them.

What is important to note, for this telling case study, is that Baker was entering the second year of a two-year ethnographic study in a field outside of his disciplinary background (English Language Arts). Therefore, in many ways he represented a second-year student in the intergenerational (1-4 years of participation) Advanced Placement Studio Art class taught by an experienced (29 years) Visual Arts teacher. We present this telling case study to raise issues of *limits to certainty*, when interpretations by the analyst do not match the teacher's interpretation of student performances, based on teacher's knowledge of the history of the students in the class (particularly, points of entry) as well as of the disciplinary expectations within and beyond the class (Baker & Green, 2007).

Through Baker's telling case study, we (re)construct key components of Baker's *logic-in-use* and reflect many of the points Guthrie & Hall (1983) argue for in Table 1. For example, we explore how Baker's initial analysis of the student performances led to a "rich point" (Agar, 1994), an unexpected moment that requires further examination to gain understanding. We will also explore how his lack of knowledge of particular social contextual factors of the situation became visible only after he engaged in further discussions with the teacher about the students. By challenging his initial assumptions of discursive patterns that he had identified and by (re)considering a collaborative analysis, he (Baker, 2001; Baker & Green, 2007) recognized *limits to certainty*. This process of analysis led to the following questions:

- What analytic processes guide researchers-as-observers in interpreting what is happening, particularly in considering the perspective of participants (*insiders*)?
- Moreover, what background knowledge of the teacher's/teachers' and students' histories is critical to consider in order to understand what the ethnographer, as an outsider, is seeing, hearing and understanding, and thus, is able to develop as warranted accounts of phenomena under study (Heap, 1995)?

Entering the Studio Art Class: Historical Roots

Baker and the studio art teacher, and one her colleagues, originally met during a summer institute designed for teachers (the National Writing Project), and through their dialogues Baker grew interested in how the *creative process* was introduced to an intergenerational group of students by this studio art teacher. Their mutual interest in the creative process led to ongoing conversations and the two-year collaboration in which Baker recorded classroom life on video and in fieldnotes (cf., Emerson, Fretz & Shaw, 2011; Corsaro, 1981, cited in Evertson & Green, 1986) during his cycles of observation: the first 2 days of the class, continuous days each week, and whole cycles of activity across the two years of public critique. Through this process of entering each observation day, recording the flow of events in fieldnotes and video recording, and archiving and analyzing these records of classroom life, Baker strived to achieve his goal of gaining an insider's perspective (understanding) of what constituted studio art and the work of artists in this classroom community.

During the first year of the ethnographic study, Baker conducted a series of interviews with volunteer students. During an interview, one of the students stated, "If you want to know about the [studio] art class, you need to see [public] critique" (Fieldnotes, February 9, Year One). Therefore, Baker, in consultation with the teacher, elected to begin the second year by entering

and observing how the teacher initiated the class prior to, and on, the first day of the school year to trace the construction of the role that public critique played in the development of the student artists. Baker began video recording and writing fieldnotes, focusing on the ways in which the teacher initiated developing events and *cycles of activity* in the class (Green & Meyer, 1991). These included materials, processes, and practices—particularly the social, semiotic (Gee & Green, 1998) and language (Bloome & Egan-Robertson, 1993) systems, as they were proposed to, recognized, acknowledged, and interactionally accomplished by students with different histories in this course (cf., Bloome et al., 2005). The archived video records and Baker's fieldnotes were a basis for him to construct an *index* for his developing archive (Corsaro, 1985; cf. Green, Chian, Stewart & Couch, 2017).

Baker began a multi-faceted process of transcribing archived video records by using an approach that members of his microethnographic-discourse analytic community frame as *running records* of the developing class (times and flow of events and first drafts of transcriptions). These running records and fieldnotes afforded Baker meso level opportunities to (re)construct the developing chains of events (shifts in activities), which were being constructed each day, a process that led to construction of *event maps* of each day (cf., Green & Wallat, 1981b; Baker et al., 2008). An *event map* is a meso level, graphic (re)presentation of the flow of activity (see Figure 3) at particular levels of scale that include: columns for clock time and for observational notes on analysis of discursive and interactional signals of transition from one event to the next. In constructing these event maps, as well as writing fieldnotes, Baker identified boundaries of events, and created a second layer of field notes (FN) that included theoretical (TN), methodological (MN), and personal notes (PN) that reflected his growing understanding of what was happening and what was being constructed in and across moment-by-moment and

overtime interactions of the teacher with students, and students with others (cf., Corsaro, 1985, cited in Evertson & Green, 1986).

This process led Baker to construct notebooks organized by days that included *running records*, *event maps*, *classroom transcripts*, and other *artifacts* (e.g., handouts). Baker also charted when the teacher invited speakers from earlier iterations of the course (e.g., alumni) to share stories and confirm discipline-based practices with the students. This process of *indexing* different records as they were collected provided a historical grounding for (re)visiting the developing history of the class as well as for adding reflexive notes (links to theory, hypotheses, methodological processes, among others) for further consideration and analysis both in and over time.

Figure 3 presents a multi-layered map of the history of the teacher and the placement of Baker's years in her class as part of the teacher's personal history as well as the history of students participating for the first time each year (timeline 1). This figure (the teacher's and program's history timeline) formed an anchor for situating the 2 years of Baker's ethnographic study of the class within this visual arts program (indicated by years that are shaded in gray).

[Insert Figure 3 here]

This level of analysis led Baker to seek deeper understandings of how students with different histories (years in the class, 1-4 years) understood and presented their work as artists during the cycle of activity in November entitled *public critique*, an event in which students as artists engaged with others in the class in a form of public evaluation of their work.

Such critique, as Baker and the students learned over developing cycles of critique (presented in Figure 3) is a common practice of the studio art world as framed by the teacher as she introduced intertextually tied cycles of activity (Bloome & Egan-Robertson, 1993), across

the first three months of the class (see timeline of cycles in Figure 3). In these intertextually tied events, she framed for students how what they were engaging in was part of the world of studio art that they were seeking to enter. In this way, the teacher made the walls of the class permeable to support students in developing visions of future sites for their work as artists.

What is also visible in the *swing out timelines* (a term in Baker's ME/DA community) is how Baker (re)presented the interconnections of the developing events in particular cycles of activity at particular levels of analytic scale. The swing-out timelines constitute a process for *situating part-whole relationships of times and events* to *locate* the point in the history of the class being analyzed. This *zooming in* and *zooming out*, creates a process that maintains the laminated (multi-layered) and historical contexts of particular events, and frames empirical ways of interconnecting particular levels of analysis (Green et al., 2012).

As indicated in Figure 3, Baker added a *running record* of the developing phases of actions that the teacher presented to students on the first day of school as practices for being artists. In this analysis, he focused on the teacher's ways of initiating a discourse of studio art as well as foreshadowing future events in which students would participate, thus, creating *intertextual* (Bloome & Egan-Robertson, 1993) and *intercontextual* (Floriani, 1993; Yeager, Floriani & Green, 1998; Bloome et al, 2005) (re)presentations of processes and events. Baker also included quotations within this timeline to foreground observed *intertextual/intercontextual references* as well as *material resources* that the teacher drew on (e.g., a video of an art event as well as letters from previous students) to introduce what counted as, and constituted, being an artist in this intergenerational program (cf., Durán & Szymanski, 1995; Putney, Green, Dixon, Durán & Yeager, 1999). Additionally, Baker (re)presented cycles of critique that included the *public critique* in November.

In his original study, Baker (2001) had identified differences in student performance during public critique of two students, and through a conversation with the teacher, he learned that these students were both first-year students in the class. As indicated in Figure 3, the two students, Maya and James (pseudonyms), were both seniors in high school but first-year students in this class and program. As also indicated in this timeline of the cycles of critique, through a *backward* and *forward* mapping of the critique cycles, Baker identified Maya's point of entry into the class as 1 month into the school year, while James entered on the first day. This process of tracing *points of entry* provided information that was not observable in Baker's live observation of the students' performance or in his initial analysis of what he was hearing or seeing. This multi-level process of analysis led Baker to a deeper understanding that what he had heard and observed in each performance was related to the two students' levels of access to developing processes of drawing techniques, materials, and practices of critique. That is, Baker learned that Maya did not have the same level of experience with critique as a practice as James.

A complete analysis of the differences in their performances is beyond the scope of this chapter (see Baker, 2001). What is important to report about the analysis is that when Baker engaged with the teacher in a conversation of the two students' performances, and the differences in the teacher's observed responses to them, the teacher made visible that she was aware of what Maya had, and had not, experienced and that her interactions with Maya were designed to support Maya in undertaking critique for the first time (see Baker in Green, Brock, Baker & Harris, in press). Furthermore, Baker also learned that James was only a first-year student, although Baker had presumed that James was a more experienced student based on the discourse and actions Baker observed during James' presentation of his drawings. That is, James' discourse reflected the teacher's discourse that Baker, as observer participant (Spradley,

1980/2016), had initially analyzed from the beginning of the school year. Because Baker had been transcribing and mapping the flow of activity for each day from the beginning of the school year, he expected to hear discourse of the drawing techniques that the teacher had introduced, descriptions of the creative process, and other practices modeled by the teacher that students had experienced within and across earlier intertextually-tied cycles of activity.

Baker's growing understanding of the roots of the differences between Maya's and James' performances of public critique was further extended, when, at a later point in time, he engaged with the teacher in a *conversation of process* that focused on his interpretation of observations of the performance of different students across the three days of critique. The teacher led Baker to understand the need to know the history of the students, not simply to base his interpretations on what he saw and heard in the moment, particularly given that some students had been there for four years and he had only been part of this intergenerational studio art class for two years. In other words, Baker, like the students, was developing understandings of, and knowledge about, what was being proposed, recognized, acknowledged and interactionally accomplished by students with different years of experiences with the processes, practices, and discourse of studio art (cf., Bloome et al, 2005).

For Baker, this growing awareness of what was observable by the teacher in contrast to Baker as a researcher (outsider) raised a similar of *access* framed by Smith (1978). That is, it raised questions about *access to what?* Access, Baker learned, involved developing understandings of the history of participants in observed events, and discourse from different points of view, often information not directly recorded in field notes, on video, or during interviews. Baker's telling case study, therefore, provides a grounding for examining and questioning what constitutes insider (i.e., emic) knowledge (cf., Heath, 1983; Heath & Street,

2008). Although Baker was alerted by a student to the importance of critique for the class, his telling case further demonstrated how a ME/DA logic-of-inquiry supported multiple levels of analysis, and, at times, new data collection and (re)analyses, which proved critical to developing theoretically grounded interpretations of developing processes and practices within the studio art class.

Thus, Baker's and Kelly's telling case studies demonstrate why no single analysis, or theoretical perspective, is sufficient to understanding how students develop disciplinary knowledge of concepts, processes and practices through educational opportunities afforded them in classrooms (Kelly, 2016a). That is, Baker's, like Kelly's, telling case study frames the importance of understanding the goals of the research and what each study provides educators and researchers (cf., Nuthall, 2007; Kaur, 2012; Morine-Dershimer, 2013). This issue, as Candela et al (2004) and Kumpulainen et al. (2009) argue, constitutes the basis for a new research agenda, one that supports deeper understandings of the complex and developing lives of learners in different educational contexts.

Closing and Opening: On What Was Learned from Telling Case Studies

Kelly's and Baker's telling case studies provide a basis for understanding the ongoing and developing nature of micro-ethnographic and discourse-based knowledge construction as framed by Smith (1978) and Guthrie & Hall (1983), and others. Kelly and Baker also demonstrate the critical need to understand the history of the participants as well as the relationship of the researcher with members of the ongoing community, in which the researcher seeks to gain entry. Through these processes, the ethnographer-as-learner seeks to understand what members need know, understand and interpret in order to participate in *culturally relevant*

ways in a developing culture-in-the-making (cf., Heath, 1982; Collins & Green, 1992; Walford, 2008; Heath & Street, 2008; Green et al., 2012; Bloome et al., 2018).

By presenting these two telling case studies, we created a foundation for understanding the need for *triangulating different angles of vision* on a particular event (participants, researchers, teacher) as well as undertaking multiple levels of analyses to construct warranted understandings of what was being observed and understood by the researcher (Heap, 1995; Green & Chian, 2018). We also made transparent the chains of decisions, actions, and theories that were guided by an ME/DA logic that constituted the particular approach to micro-ethnography, i.e., Interactional Ethnography (IE) undertaken by Kelly and Baker (cf Castanheira et al, 2000; Green & Bridges, 2018; Kelly & Green, 2019).

From the *Interactional Ethnographic* perspective, each level of analysis, as Smith (1978) and Mitchell (1984) argue, forms a basis for tracing a particular sequence of events at some level of society (an individual, a small group, a class) to learn from members what is required to participate in, what Hymes (1972; 1977) framed as a “bit of life”. Moreover, this complex iterative, recursive and abductive logic-of-inquiry supports identification of previously unexamined dimensions of classroom life as experienced by particular participants. It also provides a basis for engaging different participants in *conversations of processes* that need to be understood, to gain emic or insider understandings of what is being heard, seen and thus observed. These telling case studies, therefore, make visible how micro-ethnography is an *epistemological approach*, which supports researchers in studying a particular group, or phenomenon within a particular social context (e.g., literacy practices, epistemic processes and practices that constitute disciplinary knowledge, and equity of access to particular opportunities for learning in local contexts as well as across national contexts)(Smith, 1978; Green & Bloome,

1997; Garcez, 2008; 2017; Heath & Street, 2008; Anderson-Levitt & Rockwell, 2017; Skukauskaite, Rupsiene, Koro-Player & Beach, 2017; Bloome et al, 2018).

Furthermore, the fact that Baker and Kelly had extensive archives, which supported multiple levels of (re)analysis, makes transparent how archived records can support multiple studies at different points in time and thus, the development of deeper theories of learning through multi-faceted iterative, recursive and abductive research processes (Green et al., 2015; Green et al., 2017). These telling case studies make visible how one study may lead to the need for further analyses and the construction of new data sets to construct an intertextual *web of understandings* that lead to deeper theoretically and empirically grounded claims (Heap, 1995) about what counts as learning processes and practices for particular participants engaged in particular events with particular configurations of actors at particular points in time within particular communities of learners.

Finally, by tracing the historical roots of microethnography and discourse studies of the functions of language in classrooms, we also make visible the depth of recurrent issues in research that have led to current epistemological approaches. In this way, we reiterate the editors' call for this volume of the RRE to address how ME/DA, as an emergent approach over the past four decades builds on, and extends, ways of studying recurring issues of student access to learning opportunities in the changing educational worlds of the 21st Century.

Table 1: Analytic Constructs Derived from Guthrie and Hall (1983)

Phenomena to explore to understand how language functions in classrooms include:

- Examining effects of situation and context on human speech performance in different contexts of use
- Examining situation constraints on language use and how they influence performance of children
- Identifying ways to more fairly assess abilities of the child/student
- Identifying and delineating social factors contributing to variability in speech and school performance
- Exploring conditions in which formality of situation influences observed performance
- Identifying social context of situation
- Identify the social context of interactions
- Identify whether the situation represents rather stable patterns constructed across times, events and configurations of participants
- Social context may be thought of as the immediate environment of interactions or as a more dynamic level of situation

Conceptual Perspectives That Guide Research from a Micro-ethnographic Perspective

- Participant structures are patterned or expected ways in which interactions are arranged and undertaken in
 - Whole-group patterns of instruction
 - Small-group patterns of instruction, or seatwork
 - Individual interactions with material resources constructed in and/or brought to the classroom
- Participation structures are developing in particular local and situated contexts and will differ in terms of ways of speaking, getting to speak, getting turns at talk, who can speak, etc.
- Constructs defining interactions in classroom may differ in terms of
 - Whether context is, or is not, conceptualized as created by the ways in which people organize their interactions
 - How interactions and/or discourse is transcribed, analyzed, and interpreted and (re)presented in writing
 - How People are viewed as contexts for each other, or not
 - How the conceptual framework guiding the research examines everything people say and do in the course of interaction to identify ways that they signal changes in context
- Contextualization cues that support meaning construction include
 - paralinguistic (pitch, stress, intonation, pause, juncture)

- nonverbal actions, proxemics, kinesics, gesture, eye gaze, and spatial orientations
 - references to present, past and future processes, events and actions/interactions, etc.
 - visual dimensions, including multi-modal resources used by, referenced, constructed in the interactions
- Social interaction is a multidimensional process and subject to constraints on several levels (social, cultural and situational)

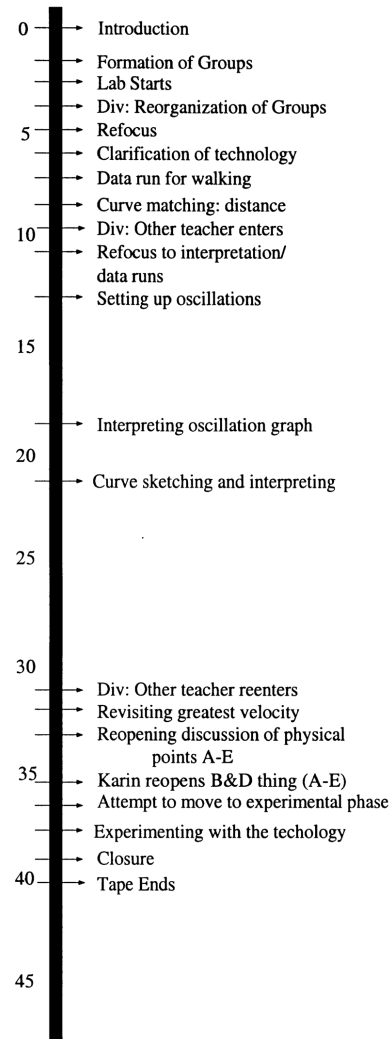
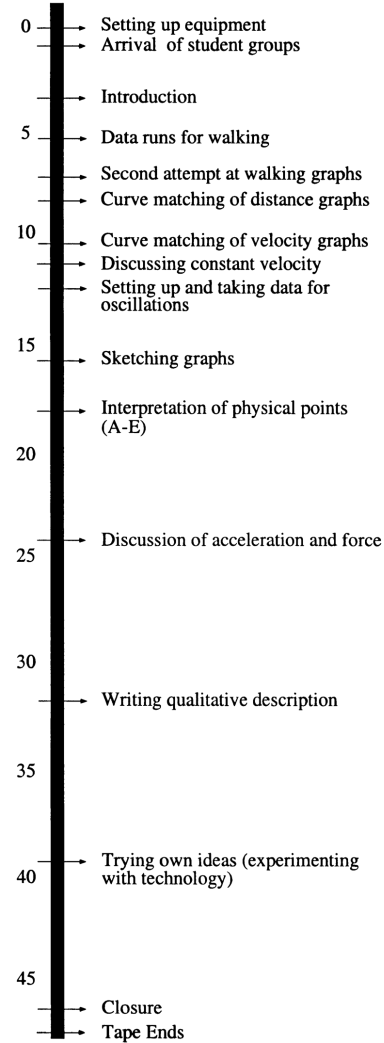
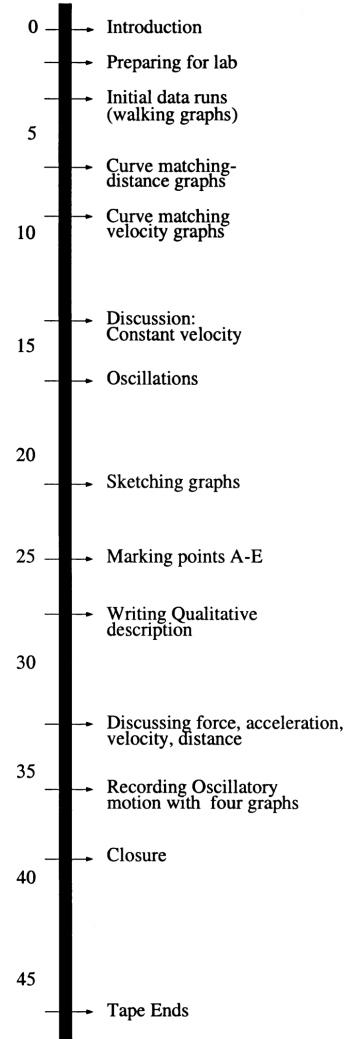
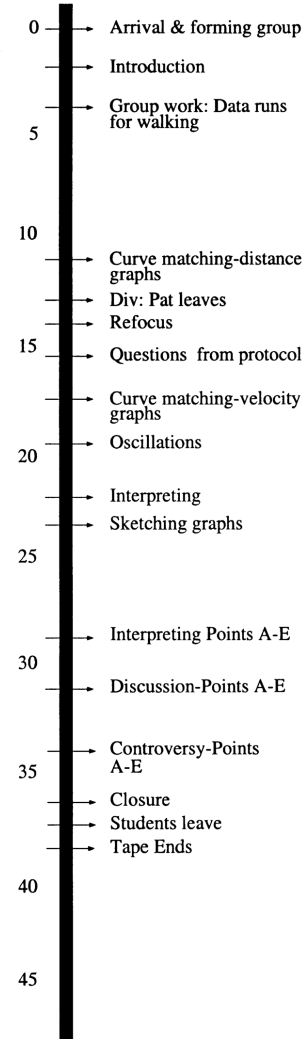
GROUP 1**GROUP 2****GROUP 3****GROUP 4**

Figure 1. Timelines of four physics student groups with phase unit activities marked (From Authors, 2001).

1088	Sue	=yeah =but you	gesturing and pointing to the	
1089		it'd have to be a straight=	computer	
1090	Pat	=it would be going=		
1091	Sue	it would have to be	tracing a possible graphical	hypothetical data
1092		that way	representation	
1093		this way	and pointing to the	
1094		that way	computer screen	
1095		that way		
1096	Pat	yeah		
1097	Fran	so it		physics knowledge
1098		would always have to be a straight		
1099		line it couldn't be anything		
1100	Sue	it couldn't be curved		physics knowledge
1101		that's like		
1102		changing		
1103	Pat	well		
1104		you know		
1105		but you could		
1106		go		
1107		da	moving hand back and forth to show possible movement (no data collected)	physical movement
1108	Sue	like on her		
1109	Pat	and then come back		
1110		and still be going		
1111	Sue	=but no=		
1112	Fran	=but that =	moving hand and pointing	physics knowledge
1113		moment of change	to notebook	
1114		when you go to turn it		
1115	Sue	that's acceleration		physics knowledge
1116		change in direction		
1117		is acceleration		
1118		this is		
1119		what		
1120		you're		

(00:10:02-00:13:56)	2. T instructing students to pick up two index cards and select a workbench	at door (80-134)
(9:22-9:30) (00:13:57-00:21:04)	1. Students writing two questions, etc. 2. T giving each student an envelope 3. Students passing back index cards	3. T taking roll and initiating “index card activity” (134-235)
(9:30-9:44) (00:22:32-00:36:14)	1. *T presenting overview day and program 2. Introducing Disney video 3. Playing Disney video 4. Explaining links with video	4. T welcoming, presenting agenda and introducing self and program (236-686)
6 min. (00:28:28-00:34:28)		4a. Disney video (442-621)
9:44-9:55 (00:36:15-00:47:24)	1. T reading letters from: D, M, A, C 2. T explaining connections	5. T reading and commenting on excerpts from letters of past students (687-1063)
9:55-10:00 (00:47:26-53:01)	1. T assigning letter of intent 2. Handout; quoting Z. Hurston 3. “Student agendas”	6. T assigning: Read letter from past student and write letter of intent (1064-1243)
10:00-10:09 (00:53:03-01:01:40)	1. T introducing sketchbooks 2. Notebooks: connection to AP and areas of concentration 3. Folders: Value of handouts 4. Fee: Cost of some of the materials	7. T presenting four needs for class (1234-1568)
10:09-10:15 (01:02:04-01:08:18)	1. Mini-chalk festival with kids 2. Visit from superintendent 3. Presentations from students who attended art summer school 4. "Film Festival"; 5. "Breakfast Club"; 6. “Fashion Show”	8. T discussing “Highlights” of upcoming year (1569-1792)

HISTORY OF CYCLES OF CRITIQUE

Framing class 9/2: James enters	<i>Friendly Sharing</i> 9/10, 13	<i>Gentle Critique</i> 9/22-24	Maya enters 10/11	<i>Deep Critique</i> 11/16-19
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Figure 3. Timelines leading to cycles of activity of public critique (Modified from Baker & Green 2007)

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