

The Learning Sciences as a Setting for Learning

Michael A. Evans, Virginia Tech, School of Education, Blacksburg, VA, mae@vt.edu

Martin Packer, Duquesne University, Pittsburgh, PA & UNIANDES, Bogotá, packer@duq.edu

Reed Stevens, Northwestern University, School of Education and Social Policy, Chicago, IL, reed-stevens@northwestern.edu

Cody Maddox, Duquesne University, Pittsburgh, PA, codyloganmaddox@hotmail.com

Keith Sawyer, Washington University, Department of Education, St. Louis, MO, ksawyer@wustl.edu

Jorge Larreamendy, UNIANDES, Bogotá, jlaream@uniandes.edu.co

Abstract: This symposium offers a reflexive examination of the Learning Sciences. We draw upon a variety of empirical data to explore the way the Learning Sciences is a distributed phenomenon, built on assemblages of artifacts, in which cognition is distributed and constructed, and identities are constituted. Our analysis has three steps. First, we explore the learning sciences community as a space in which discourse circulates, concepts are put forward, and specific kinds of objects have become recognized. Central among these objects, of course, is 'learning.' Second, we look in detail at examples of the interactions in which learning scientists do their work. Third, we consider how a learning scientist is formed as a particular kind of person through participation in formative practices of the community.

Overall Focus of the Symposium

The Learning Sciences have been defined as an interdisciplinary approach to the study and the facilitation of learning in real-world settings (Bransford, Barron, Pea, Meltzoff, Kuhl, Bell, Stevens, Schwartz, Vye, Reeves, Roschelle, & Sabelli, 2006; Meltzoff, Kuhl, Movellan, Sejnowski, 2009). Learning Sciences programs frequently include faculty with diverse background and training, from fields that may include cognitive science, psychology, education, machine learning, neuroscience, sociocultural studies, and educational technology. But what kind of setting is the Learning Sciences itself? Through what kind of participation in real-world activities do learning scientists learn how to recognize learning, and what do they learn about it? How does someone learn to be a learning scientist?

This symposium undertakes a reflexive examination of the learning sciences. The presenters consider a range of empirical data to explore the Learning Sciences as a distributed phenomenon, an assemblage of artifacts, a space in which cognition is distributed and constructed, a community in which identity is forged. Our analysis has three steps. First, we examine the official discourse of the Learning Sciences, its texts and announcements, in order to reconstruct the space in which that discourse circulates, to articulate the concepts that are advanced, and to identify the specific kinds of objects that the Learning Sciences recognize. Central among these objects, of course, is 'learning.' Second, we look in detail at samples of everyday interactions among learning scientists in one selected program to see how they do their work. Third, we consider how, in this program at least, a learning scientist is formed as a particular kind (or kinds) of person through participation in formative practices of the discipline.

A number of learning scientists have pointed to the importance of reflexivity in learning. For example, Sawyer (2006) points out in the introduction to his *Handbook of the Learning Sciences*:

“Studies of experts show they are better than novices at planning and criticizing their work - both reflective activities.... Based on these findings, and similar findings regarding other school subjects, learning scientists often conceive of the problem of learning as a problem of transforming novices into experts by developing their ability to reflect on their own thinking in these ways” (p. 7).

It is appropriate, then, for learning scientists themselves to be reflective, and work to increase our reflective activities of, and capacities for, examining our own work. One way to do is this by applying some of the techniques of objectification of the Learning Sciences to these sciences themselves.

Indeed, it has been proposed that reflexivity is an important component of all social scientific inquiry, one that is necessary to avoid the “symbolic violence” of imposing the scientists’ conceptual framework on the people who are studied, or assuming an intellectual attitude when in fact people are engaged in embodied, practical activity (Bourdieu & Wacquant, 1992). This is not to ignore or deny the challenges involved in any self-reflexive activity. Blumenfeld, Kempler, and Krajcik (2006) note that teachers and students “may not respond well to the idea of reflecting on and revising their work” (p.475), and they point out the importance of finding the right motivators and forms of cognitive engagement to promote a reflexive frame of mind. We hope to demonstrate in this symposium that a reflexive investigation of the Learning Sciences has value.

Major Issues Addressed by the Collected Work

The three presenters will each report on one step of our analysis, though our work has been a collaborative division of labor. The first presenter (Evans) will describe the results of our activities of tracing and mapping the “community of practice” of the Learning Sciences as a dispersed and contested network in which concepts are mobilized to develop claims about specific objects of investigation. The second presenter (Stevens) will add a temporal dimension, reporting both on our reconstruction of this history of this network and on an interaction analysis of an episode of everyday activity in a selected Learning Sciences program. The third presenters (Packer and Maddox) will explore the “techniques of the self” in which students become learning scientists through their participation in such activity. Our intention is that these three steps will lead to a more profound understanding of the Learning Sciences as a form of life: a human activity system that produces knowledge, practices, and people that is, in turn, reproduced and transformed by these people as they apply their knowledge in action.

The Learning Sciences are frequently located in Pasteur’s quadrant, that is to say as bridging the division between ‘basic’ and ‘applied’ research, as seeking fundamental understanding of scientific problems and at the same time aiming to be beneficial to society at large (Stokes, 1997; Schoenfeld, 1999). The design studies and design experiments advocated by methodologists in our field hold up this “bridging” feature as unique, distinguishing us from disciplines more focused on theoretical conjectures and clinical work, such as cognitive science, neuroscience, and educational psychology (Confrey, 2006). The reflexive examination of the Learning Sciences in this session has the same dual goals. We hope to understand how our interdisciplinary enterprise is functioning - what makes it tick. But we also hope that by identifying key characteristics of the operation of the Learning Sciences - as well as perhaps pointing out some contradictions and obstacles - our analysis can be beneficial in practical ways, and have application to the training of the next generation of learning scientists. The presentations are not intended as external criticism, but rather as an example of circumspection from within, in which practitioners pause to look around at what we are always already doing, to articulate what we see to return to our practice with increased clarity. The three presentations will now be described in more detail in the next sections, a brief overview offered below:

- Presentation 1: Mapping the Network of the Learning Sciences: traces the network of the Learning Sciences and maps its territory, primarily by focusing on the dispersion of concepts in ‘official’ texts such as program descriptions, course syllabi, and published papers. The various Learning Sciences programs are then located on this map.
- Presentation 2: The History and Micro-Genesis of the Learning Sciences: reconstructs the history of this network and also describes its micro-genesis, through the interaction analysis of an episode of everyday interaction obtained through fieldwork at one Learning Science program selected from the map.
- Presentation 3: The Making of a Learning Scientist: describes how a student becomes a learning scientist, based on the same interaction analysis and interviews with newcomers and old-timers.

Presentation 1: Mapping the Network of the Learning Sciences

The first presentation will explore the Learning Sciences as a form of life and a setting for learning. This presentation traces and maps the networks or assemblages that define the Learning Sciences. Rather than assume from the outset that the Learning Sciences is a coherent, consensual or clearly defined intersubjective space, we treat it first as a geographically dispersed and temporally dynamic network of participants, artifacts, and institutions, and then map this network to see where consensus lies and where there is contestation. As Nespor (1994) has written:

“interactions and situations are... articulated moments in networks of social relations and understandings, in which our experiences and understandings are actually constructed on a far larger scale than we happen to define for that moment as the place itself, whether that be a street, a region, or even a continent” (p. 3)

Tracing the linkages of the network that is the Learning Sciences is a necessary first step, then, that should be prior to any examination of interpersonal relations or personal understandings. It is increasingly recognized that learning takes place in interactions that are mediated by designed artifacts (Stahl, 2006; Suthers, 2006), and that such artifacts are often arranged in a highly geographically dispersed manner, the extreme case being international virtual teams of academics, researchers, and collaborators (Bichelmeyer, Cagiltay, Evans, Paulas, & Soon, 2005; Evans & Schwen, 2006). There are now Learning Science programs in at least three universities outside the United States (in the Netherlands, the United Kingdom, and Australia), so the network has now grown to this scale. Given the interdisciplinary character of much research in the Learning Sciences it is quite likely that even the simplest arrangement will involve sophisticated linkages.

This first presentation will present the results of our analysis of data from at least twelve recognized Learning Sciences programs. Official program definitions, statements of program goals, syllabi of required courses, and other data provide evidence of the similarities and differences among these programs. In this way, the assemblages of the Learning Sciences can be said to define a space in which discourse circulates. In the form of published papers, oral presentations, research reports, informal messages, and so on, this discourse serves to propose claims about the specific kinds of objects recognized by the learning sciences, using concepts of various kinds. The concepts of the Learning Sciences serve as a vocabulary in which knowledge claims about these objects are proposed, contested, and accepted or abandoned. They offer ways for learning scientists to see the world. Tracing these concepts enables us to see where the Learning Sciences is dynamic and contested, and where it is unified and homogenous.

For example, one of the central concepts of the Learning Sciences is *cognition*, but it is interpreted in a variety of intersecting ways. *Cognition* can be understood as the structures and processes of knowledge, so that the principal goal of teaching and learning is the transformation of cognition. But cognition can also be understood as something situated, practical, and even ‘wild’ (Hutchins, 1995). On one side there are laboratory-based computer models that aim to simulate human knowledge and skills. On another side are ethnographic studies in which it is insisted that cognition should never be separated from culture. The metaphor of building knowledge is frequently used (Scardamalia & Bereiter, 1994), but individuals interpret this metaphor in different ways with different presumptions about cognition.

A second central concept is that of *social context*. The Learning Sciences tend to emphasize the dynamics of real situations of learning and teaching, in contrast to the laboratory studies of cognitive science. Attention is focused on the complexities of the real world, and on the need for ecological validity in scientific studies. But social context can be construed either as an external factor which has an influence or impact on cognition, or as an intrinsic aspect of cognition, something constitutive of thinking and learning. Social context can be a concept used to refer to specific circumstances, such as the workplace or classroom, or it can be used to refer to everyday life, to the essentially social character of all thought and action. In the latter case, even the laboratory is a social situation.

While these are concepts that surely are inherent to the Learning Sciences, so that without them it would not exist, there are others that one might say demonstrate how the network extends to other areas of the social sciences. One such concept is *mediation*. Mediation is a major tenet of Vygotsky’s (1986) account of learning and especially concept development in children, since he proposed that people interact with the world “indirectly” through the use of mediators. In the Learning Sciences the concept has been applied in this way to analyses of how children acquire understandings of the world around them. From this perspective, it is as children use cultural and psychological tools (i.e. signs and symbols) that they acquire higher psychological functions such as analysis and reasoning. This original conception of mediation, though, has been challenged (Wertsch, 2007) and extended to include rules, community, and division of labor (Barab, Evans, & Baek, 2004). What might be claimed is that mediation has taken on a broader, more complex place in the learning sciences, particularly in the digital age (Shaffer & Clinton, 2006).

Vygotsky’s texts on cultural-historical development also make use of the concept of *tool*. Vygotsky argued that society’s tools, language, signs, and technologies were closely intertwined with their collective levels of cognition. As a result of the integration, how things are done changes, perhaps forever:

“As soon as speech and the use of symbolic signs are included in this (tool) mediated operation, it transforms itself along entirely new lines, overcoming the former natural laws and for the first time giving birth to authentically human use of implements... speech and actions are in this case one and the same psychological function” (Vygotsky & Luria, 1930/1993, pp. 108-109)

But the concept of *tool* has another lineage in Learning Sciences, one that reflects interests in the cognitive potential and transformative power of technology. For example, Brown, Collins and Duguid (1989) recommended that knowledge be thought of as a set of tools. Tools can be learned only through their use, and in using them the user changes, in particular they come to adopt the belief system of the culture that produced the tools, because “tools and the way they are used reflect the particular accumulated insights of communities” (p. 33). In this way of talking and seeing, learning is a process of enculturation and apprenticeship, a result of being embedded in practical activity that, nonetheless, leads to abstract knowledge.

Finally, the core concept of the Learning Sciences, of course, is *learning*. Here too what we find is, understandably, not consensus but an intersection of efforts to carve out a plausible way of conceptualizing the complexity of people coming to do their work successfully together. To return to the example in the last paragraph, in Brown, Collins and Duguid’s way of talking and seeing, learning is a process of enculturation and apprenticeship, a result of being embedded in practical activity that, nonetheless, leads to abstract knowledge. In Vygotsky’s texts, in contrast, learning is a process of self-mastery, in which social tools are applied to self. These various positions and perspectives on learning in the Learning Sciences, at times complementary, at times

in opposition, reflect to some degree its interdisciplinary character. Is learning a neurobiological phenomenon? Is it a change in internal systems of mental representation? Is it transformation in embodied practical activity? Here the dynamic tension of the Learning Sciences is most evident, and the sources of its creativity and generativity are most apparent.

By tracing these concepts of *cognition*, *social context*, *mediation*, *tools* and *learning*, this first presentation will construct a map of the territory occupied by the Learning Sciences, and identify its shifting and contested boundaries. The various Learning Sciences programs can then be located on this map, enabling us to make a principled selection of a program to study in detail in the second and third steps.

Presentation 2: The History and Micro-Genesis of the Learning Sciences

The second presentation introduces a genetic or temporal dimension into our investigation, both historical and micro-genetic. It traces the history of Learning Sciences, reconstructing the genealogy of its origins in the Artificial Intelligence and Education conferences of the 1980s, the founding of the Northwestern University Institute of the Learning Sciences and the Xerox Institute for Research on Learning, the inauguration of the Journal of the Learning Sciences, the newly-named ICLS conference in 1991 and the subsequent alternation of ICLS and CSCL conferences, and the founding of ISLS in 2002.

Roger Schank has argued that it is in stories that humans store and organize knowledge (Schank & Abelson, 1994). The stories that participants tell about the origins of their community of practice offer important insights into the character of that community. This second presentation will draw both on published retrospective accounts of Learning Sciences and on interviews with selected learning scientists or, at least, those who would claim that their work addresses problems important to the learning sciences. One way of telling the story of the Learning Sciences, for example, is as a tale of frustration with cognitive science that led to the birth of the new journal JLS, a “big ideas” journal that has focused on learning in real-world situations, that has explored new perspectives and new methodologies as well as novel uses of technology, and from which a community has grown and matured (Kolodner, 2004).

Another example is Koschmann’s (1994, 1996) retelling of the history of “paradigmatic shifts” in learning theory, models of instruction, and research issues. His reconstruction of the origins of computer-supported collaborative learning describes the accumulations and dissolutions that took place as the field moved from its early roots in behaviorism, programmed instruction, and instructional efficacy to socially oriented theories of collaborative learning and instruction as enacted practice (Koschmann, 1996, p. 16).

Like any good evolutionary account, this presentation will pay attention to the fit and mutual constitution of organism and environment (in this case the various niches of the Learning Sciences and its various niches) as well as to the impact of rare but dramatic forces from outside the system. Or, to switch metaphors, like any genealogy, it will pay attention to the orderly arrangements of patrimony and birthright, as well as to the accidental encounters that bring strangers together and lead to unforeseen offspring.

At the same time, a second temporal aspect of the Learning Sciences is the moment-to-moment processes of learning scientists’ interactions. Study of face-to-face interaction has become an important methodology for the Learning Sciences (Jordan & Henderson, 1995), and “Many learning scientists study the moment-to-moment processes of learning” (Sawyer, 2009, p. 13). A reflexive investigation of Learning Sciences should not neglect this important aspect of understanding the discipline. Consequently, this second presentation will also report on analysis of a selected episode of everyday interaction. This episode will be obtained through fieldwork in a selected Learning Sciences program. As Nesper (1994) has pointed out, studies of face-to-face interaction need to be informed by knowledge of the network in which they are located, and this will be one way in which the second presentation relates to and is informed by the first.

In short, the second presentation will bring an explicitly temporal dimension to the network of discourse, concepts, and objects that was described in the first presentation, to explore both the history of how it came to assume its current form and the ongoing way in which the network is reproduced.

Presentation 3: The Constitution of a Learning Scientist

The third presentation describes the final step in our analysis. Having traced the network of arrangements that define the community of the Learning Sciences, and having studied in detail both the history of this network and the interactions in which learning scientists do their daily work, we turn to the specific techniques by which people become learning scientists. Here too we are able to turn the tools of the Learning Sciences around and apply them reflexively, for this too has been a topic of interest in the Learning Sciences. Whether it is “peripheral participation,” the move from “novice” to “expert,” or the formation of “identity,” learning scientists have been interested not only in the ways that learning involves construction of knowledge but also the ways it transforms the learner as a person.

Kolodner, for example, has written of LS as a “community of practice” in which a learning scientist is formed as a person with “deep and abiding” beliefs who can “harvest” theories in order to “design” environments. She has pointed out that although the first members of the Learning Sciences community were

“immigrants” from the shores of other disciplines and endeavors, new learning scientists are now home grown: “Over the past decade, we’ve added a generation of young researchers educated by immigrants to the learning sciences as first-generation learning scientists” (Kolodner, 2004).

Graduate training in programs in the Learning Sciences is frequently described in terms that reflect the local theoretical framework. For example, there may be a focus on apprenticeship, as students collaborate with teams working on funded research projects. Such teams are often interdisciplinary, so students have hands-on experience of design and methodology from a variety of perspectives. Coursework may emphasize practical work on projects, closely tied to faculty members’ ongoing research. Effort may be made to establish community, in part through informal meetings that are both academic and social, in part through participation in formal events such as conferences and colloquia. Both classroom and research activities may be situated in real-world settings such as workplaces and schools. Finally, students’ research may be directed towards the design of learning environments and to the transformation of activity in a real setting.

Such aspects of graduate training can be considered as ways the Learning Sciences has arranged for its reproduction over time, its continued existence through the production of new practitioners who have not only the appropriate knowledge and skills but also the practical know-how and everyday common-sense needed to act as a member. Since Lave and Wenger (1991) coined the phrase “legitimate peripheral participation,” if not before, learning scientists have conceived of group membership as the entry not only to new forms of knowledge but also new kinds of identity. As they put it, “one way to think of learning is as the historical production, transformation, and change of persons” (Lave & Wenger, 1991, p. 52), so that “learning thus implies becoming a different person with respect to the possibilities enabled by these systems of relations. To ignore this aspect of learning is to overlook the fact that learning involves the construction of identities” (p. 53). But *identity* is a concept that itself is used in differing ways by different branches of the Learning Sciences discourse. For example, when Greeno (1997) proposed that “students develop patterns of participation that contribute to their identities as learners,” Anderson, Reder and Simon (1996) complained, “We really do not know what Greeno means by a student’s ‘identity as learner,’ or to what extent he pictures identity as being subsumed in a ‘group identity’” (p. 19). An accord was soon reached (Anderson, Greeno, Reder & Simon, 2000), but still for some, identity is equivalent to self-concept: the conception a person has of him or herself. For others, identity is an aspect of membership, how other participants in a community identify a person. It has been suggested that we conceive of learning as a process in which both people and their form of life are transformed (Packer & Goicoechea, 2000), a transformation with an embodied character, an ontological rather than merely epistemological process.

Whether the transformation is thought of as a peripheral participant becoming non-peripheral, apprentice becoming master, or novice becoming expert, what is of central importance to us is that the work of becoming a learning scientist is public and practical, and so it can be studied. A particular application of interaction analysis, then, is the investigation of participation in those professional activities in which the person is transformed. The third presentation will draw on analysis of both episodes of interaction and interviews, the latter as opportunities to explore the “ontological complicity” that a participant comes to have with their community of practice.

An example of a technique for bringing a student into the Learning Sciences is provided by a research project co-led by undergraduate students at the University of Chicago. The aim of the project was to identify children’s communicative strategies when faced with the task of solving a geometric puzzle in a group setting, and so identify their potential for creating ‘distributed’ cognition in mathematics learning contexts. One data set included two groups of three 8-year-old children, one group of boys and the other of girls, each given a tangram puzzle to solve in two different settings: a physical set-up, using plastic pieces and a board; and a virtual set-up, using a computer and mouse to maneuver the pieces into place on the screen. By examining the children’s speech, gestures, gaze and actions, the student researchers explored the points of discursive cohesion that structured the groups’ collaborative reasoning throughout the process of solving the problems. Cohesive points were identified as “coreferences,” understood as the repeated expression of a single referent (Evans et al., 2009). In this study, the investigators wished to expand the concept of ‘coreference’ to include both verbal and non-verbal deixis. The result was an expansive rubric for classifying how action, gesture, and speech related to and built upon one another during the problem-solving process. Viewed in terms of the larger goal of developing advanced technologies to facilitate collaborative problem solving in mathematics, such results may lead to new requirements for instructional strategies, technologies, and interventions.

Our point in summarizing this research project is to emphasize that participation in such projects is one important way that students become seasoned scientists. Viewed reflexively, such a project amounts to a communication and learning task *for the researchers*. They must discover how to establish points of discursive cohesion as they observe and talk together about the video-recordings of children’s interaction. As they develop a system of classification of children’s actions, gesture, gaze and speech, their collective vision of the events they are studying is transformed. The researchers concluded that pivotal moments of interaction occurred when the children directed the development of their collaboration by using meta-commentary about the task itself.

Our reflexive analysis of this kind of example of learning science research amounts to just such a meta-commentary.

In short, this third presentation will focus on the material practices in which learning scientists are constituted, the embodied expertise or *habitus* they come to have, and how this provides them with the methods (such as interactional devices) that are necessary for them to be successful members of the community.

Connections Among Presentations

In summary, these three presentations work together to describe three aspects of the Learning Sciences considered as a site and activity of learning, and becoming. The first presentation maps the terrain that is defined by the network of people, artifacts and places that constitute the Learning Sciences, the second reconstructs the history of this network and describes the ongoing collaborative work in which it is maintained, while the third explores how one becomes a participant. The search for knowledge will be considered a process of interaction among members, and a practice in which newcomers become old timers. We hope that we have shown how the parts of this symposium fit together to create something that is more than their sum.

Potential Significance of the Contributions

Where are the Learning Sciences at this moment? In what direction is the field going? Which questions have been asked and answered successfully, and which questions apparently resist solution? What questions need to be addressed in future work? What is the problematic from which these questions arise?

These are *our* questions about the Learning Sciences, and in this symposium we will begin to answer them. In a paper titled “Learning for anything everyday,” Heath and McLaughlin (1994) discussed pedagogical authenticity and presented their ethnographic research on fields of informal learning. They offered two conclusions that are relevant to any focus on the inter-relationships of participation in diverse communities. The first is that authenticity cannot be artificially created. The second is that, nevertheless, it is possible to create supportive organizational or learning environments in which authentic activity is embedded, environments which may increase the likelihood of novice members moving into more sophisticated roles and communal ways of knowing.

Heath and McLaughlin concluded that pedagogical authenticity is to be found in the structure of tools and activities, both current and historical that define participation in a specific community. This suggests that authentic curricula should include access to “the social distribution of knowledge and skills through personal, interpersonal and community working together” (Heath and McLaughlin, 1994, p. 473), and that analyses of this distribution are necessary if we are to understand how people work together in a community. Taking participation seriously means thinking in spatial-temporal terms. Authentic curricula are explicit efforts to provide students entry into the experiences afforded by being part of the historical-material-social geographies of participation. Authenticity also requires relevancy; when institutions such as the Learning Sciences are certainly created, the goals, values, initiatives, and functions of the social organization must be relevant to the day-to-day needs of the participants and communities involved.

Heath and McLaughlin also identified structural features shared by successful, authentically embedded informal learning fields (cf. Schneider & Evans, 2008), features we will look for in our analysis of Learning Sciences:

1. Organizations serve as border zones: they support active participation in the community while brokering and preparing participants to participate in other organizations. The community’s participation shares values, skills, and roles with these other communities.
2. Successful organizations value novices as a resource that contributes much-needed talent, perspectives, and experience. The division of labor is non-hierarchical and there is a strong sense of belonging.
3. All participants contribute to defining problems and finding solutions or to the plan of action. There is intense collaboration, with activity organized around a relevant problem, project, or product.
4. Participants are accountable to each other and to the group.
5. There are few community rules of conduct, but these are strictly enforced.
6. Participants are continuously assessing themselves and each other, and are assessed by people outside the community that they perform for, provide products to, or interact with.

Participants (alphabetical order)

Michael A. Evans – Presentation 1: The Learning Sciences as a Community of Practice

Dr. Evans, an assistant professor in the department of learning sciences and technologies at Virginia Tech, teaches courses and conducts research focusing on the application of human learning theory to the design and development of instructional materials and systems. Graduate courses taught include games and simulations for education, instructional multimedia development, and, perhaps most relevant to the symposium, and

introduction to the learning sciences for advanced masters and doctoral students. His publications include *Facilitating guided participation through mobile technologies: Designing creative learning environments for self and others* (Journal of Computing for Higher Education), *Transforming e-learning into ee-learning: The centrality of sociocultural participation* (Innovate: Journal of Online Education), and *Conceptual and practical issues related to the design for and sustainability of Communities of Practice: The case of e-portfolio use in preservice teacher training* (Technology, Pedagogy, & Education).

Jorge Larreamendy, UNIANDÉS – Chair

Dr. Larreamendy is associate professor and chair of the Department of Psychology at the University of the Andes in Bogotá, Colombia. He was a visiting professor at the Learning Research and Development Center, Pittsburgh. His research interests center on scientific reasoning, informal learning, and learning in communities of practice. His publications include *Going the distance with online education* (Review of Educational Research with G. Leinhardt), *Learning, identity, and instructional explanations* (to appear in Stein & Kucan (Eds.), *Instructional explanations in the disciplines*).

Cody Maddox – Presentation 3: The Constitution of a Learning Scientist

Cody Maddox is a graduate student in the Department of Psychology at Duquesne University in Pittsburgh.

Martin Packer – Presentation 3: The Constitution of a Learning Scientist

Dr. Packer is an associate professor in the Department of Psychology at Duquesne University in Pittsburgh, and associate professor in the Department of Psychology at the University of the Andes in Bogotá, Colombia. He teaches courses in developmental psychology and qualitative research methodology. He is one of the founding editors of the journal *Qualitative Research in Psychology*, published by Taylor & Francis. He is author of *Changing Classes: School Reform and the New Economy*, and co-editor of *Cultural and Critical Perspectives on Human Development*. His book *The Science of Qualitative: Towards a Historical Ontology* will be published this year by Cambridge University Press.

Keith Sawyer, University of Washington, St Louis – Discussant

Dr. Sawyer is an Associate Professor of Education at Washington University, with additional appointments in the Department of Psychology and the School of Business. He is author of *Group Genius: The Creative Power Of Collaboration* and editor of *The Cambridge Handbook Of The Learning Sciences*. He studies creativity, collaboration, and learning.

Reed Stevens – Presentation 2: Interaction Analysis of the Learning Sciences

Dr. Stevens is Professor of Learning Sciences at Northwestern University. His research interests include learning and activity in a wide range of places and situations; design of learning tools — curriculum, activities, and technologies. Publications include (co-authors cited in reference below) *Foundations and opportunities for an interdisciplinary science of learning* (The Cambridge Handbook of the Learning Sciences).

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