

# A New Role in Facilitating School Reform: The Case of the Educational Technologist

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*School reform advocates have been frustrated over the slow pace of integrating proposed school improvements, hypothesizing that the resiliency of established roles contributes much to the conserving tendencies of educational institutions. In seeking to understand this issue, the school reform movement has paid close attention to established roles, such as teachers and principals, and the issues these individuals face as they seek to address change. They have paid relatively little attention, however, to the emergence of new roles. The educational technologist (ET) is a role that is growing rapidly within schools in conjunction with the widespread adoption of networked technology. Looking back over 6 years of research data from a qualitative research study of networked technology integration in one K–12 system, the author examines the emergence of the ET role from the classical sociological perspectives of social structure, space, and time and its relationship to the cluster of core positions. This study demonstrates the importance of role to school reform issues, indicating that it can be used as a critical lens for understanding the progress of reform and the nature of technology integration.*

A constant concern in school reform has been why it is so slow and painful. Why, despite the money, time, and effort expended, do we seem to see so little gain? In particular, why do educators' established roles seem to have such resilience?

A classical study in this arena, *How Teachers Taught: Constancy and Change in American Classrooms 1880–1990*, demonstrates how teachers have clung to their traditional instructional roles for a good century, despite numerous attempts by progressive educators to reshape instructional patterns (Cuban, 1993). The strength of the conserving function has also been noted in other studies of school reform (Conti, Ellsasser, & Griffin, 2000).

Educational reform requires much in regard to the roles of those who work within educational systems. Such changes are not always swift or easy to make because they entail issues of identity, the content and organization of the tasks that compose educational work, and the spatial, temporal, and social relationships in which the work is embedded.

Many of the examples available to us about school reform describe well-established roles in which individuals must shift or change a previously defined role that they have occupied. These include studies of teachers (e.g., Bliss & Mazur, 2002; Davidson, 2000; Fullan & Hargreaves, 1992) or principals (e.g., Bizar & Barr, 2001; Telem, 2001; Wanzare & Da Costa, 2001) as well as studies that look at the whole school, describing the ways that a combination of roles intersect in the work of school reform (e.g., Lieberman, 1995; Murphy & Lick, 1998).

An area of school reform that could prove equally informative, in regard to roles and their relationship to reform, is the area of emerging new roles. Networked technology offers one such opportunity in the emerging role of the educational technologist (ET). This is a position that is growing in numbers as schools and districts become increasingly reliant on networked technology. Although the position title and specific duties vary from district to district, in general, ETs are those individuals responsible within or across schools in a district for integrating technology into instruction at the classroom level. ETs are distinct from classroom teachers (responsible for one or more classes of students), computer lab teachers (responsible for teaching computer skills *per se*), computer technicians (with sole responsibility for the maintenance of machines), or curriculum specialists (holding district-wide responsibilities for the implementation of curriculum in specific disciplinary areas). The ET position often combines parts of each of these roles, if not several more as well. It is a position that did not exist before this decade but is becoming increasingly essential to schools with a well-integrated network capability.

Due to the newness of the position, there is, as yet, only a small handful of articles available on the topic of the ET (e.g., Davidson et al, 2001; Ely, 2000; McGillivray 2000a, 2000b). The title of one that kept appearing in my attempts at a literature review seems to sum up the situation well: "Wanted: Educational Technologist—Whatever that is" (Jenkins & Rossett, 2000).

New positions, such as the emerging ET position, may cause anxiety for school officials, but such places in organizational life, where tacit understandings are fragmented and numerous rules and meanings must be reformed, offer unique opportunities for researchers (Myerhoff, 1978; Turner, 1974). These conditions of rupture make role formation particularly fecund sites at which to observe an organization making sense of change (Finders, 1997; Goffman, 1959; Perinbanayagam, 1985). In considering the functions of roles, researchers have found three dimensions to be of particular importance: social structure, physical locality, and the organization of temporal life (Giddens, 1984; Hargreaves, 1992; Nespors, 1994).

In this article, it is my aim to use these three dimensions—social structure, space, and time—as a means of exploring the role of the ET as it

emerges in a particular school district, using this foundation as a means of thinking about the ET role in relationship to other core or preexisting roles within the school. This exploration is in service of my larger task of understanding the issues that large-scale educational change raises for individuals as it calls on them to construct or reconstruct their work roles. The case I rely on is the Hessen Model School Partnership, a technology integration project with which I have been involved since 1995.

### THE HESSEN MODEL SCHOOL PARTNERSHIP AND THE EMERGENCE OF THE EDUCATIONAL TECHNOLOGIST

The Hessen Model School Partnership began in 1995 in its first iteration as the Hanau Model School Partnership (1995–1998), a National Science Foundation (NSF)–supported project to create a test site for exploring the possibilities of networked schools. The project was a partnership between a four-school K–12 cluster (two elementary, one middle school, and one high school) on the Hanau American Army Base outside of Frankfurt, Germany, its larger parent district (Hessen School District) and a school system (the Department of Defense Educational Activities–DoDEA) and a not-for-profit research firm in Cambridge, Massachusetts–TERC. The aim was threefold: (1) to integrate technology across all grades and subject areas, (2) to ensure that technology was used with standards-based curriculum, and (3) to make the best possible use of new technologies for learning (McNamara, Grant, & Wasser, 1998).

In 1998, the school district expanded the local model to include all 17 schools in the Hessen District. Wider and deeper implementation in the context of scaling up became the focus of the following years. In June 2001, the Hessen District Office closed, and the 17 Hessen schools became part of the Heidelberg District. For the purposes of this article, I refer to the project as the Hessen Model School Partnership, the name used in its second iteration.

Implementation activities in both the first and second stages of the work focused on developing a robust technological infrastructure that would allow all members of the school community access to high-capacity networked computers and organizing a site-based management process that would include all stakeholders (administrators, teachers, parents, community, union, and district leaders). Particular attention was paid to providing comprehensive professional development opportunities and developing a comprehensive technical support program (Davidson, McNamara & McGillivray, 1999; McNamara & Grant, 1998; Wasser & McNamara, 1998).

The technology integration work was one reform initiative among many, as is typical in school districts today. For instance, at the time the project began, educators were also engaged in instituting a new math curriculum at the elementary level (curricula are periodically reviewed and new adoptions considered). Schools and districts were also active participants in the district-mandated School Improvement Plan (SIP) process. In addition to current reforms, there were also traces of reforms that had recently been undertaken, some successfully and some not. These ranged from a writing-across-the-curriculum initiative to a professional development model that sought to build teacher collegiality as it strengthened instructional skills. Each of these reform efforts, present and past, came to be intertwined with the technology integration work as it unfolded.

From the beginning of the project, it has been clear that a pivotal role in the work of integrating technology and curriculum belonged to those who were closest to the ground—the educational technologists (ET). The ET position has evolved rapidly since 1995 from its roots as multiple positions in diverse locations within the larger system. Antecedent to the ET position, there was a district technology consultant position, called a DESOC. Each school also offered stipends to a teacher with technology interests who would be available to assist other teachers with technical problems. In addition, each middle school and high school had a computer teacher, who provided students with technology training in special elective classes.

As a result of the NSF-supported work, a new position called an educational technologist (ET) was created specifically to support the work at Hanau. A communications liaison position to support the ET and assist with related technology work was also created. Recognizing the need for technical support to the rapidly burgeoning technical system, the DoDEA office in Washington created new positions called administrative technologists (AT). Over the past several years these various technologically related positions have been in flux as the duties and concerns have expanded and the system has struggled to figure out how best to deploy staff to meet these needs.

In the Hessen schools, this position in 2001 (the date of my last site visit) had changed considerably from what it was in 1995. In 2001, a team of seven ETs served 17 schools. The ETs, considered district-level personnel, were each assigned to a suite of schools, where they spent the majority of their time. ETs were assisted by a team of ATs, also district located but school embedded. Both teams were headed by a group leader. The ET who began with the Hanau Model School Partnership, Kevin McGillivray, now served as the director of the Hessen Model School Partnership and worked from the district office.

Since 1995 when the position was officially designated, the intent has been for it to focus on the integration of technology with content, forcing

content (curriculum and instruction), not technology tools, to drive the ET activities. As one ET put it, “There ought to be a mantra. ‘In order to increase the use of technology for learning . . . . In order to increase the use of technology for learning.’ You have to keep focusing people on our goal” (interview with ET, 2000).

The following question is at the heart of the ET role: What does it mean to support educators who are helping students to learn with technology? Being an ET is a constant search for the answer to this question.

### STUDYING THE EMERGENCE OF THE EDUCATIONAL TECHNOLOGIST

From 1995 to 1998, the period during which the original K–12 complex of four schools was launched as networked schools, I served as the researcher/formative evaluator for the Hanau Model School Project, making numerous fieldwork visits of 1 to 2 weeks to the site. My focus was on the nature and quality of the intervention and its impact on the school community. Using a comparison borrowed from the days of classical anthropology, I looked on the four schools as four linked villages of which the adults or elders were all members of the same tribe. During my visits I focused my attention on the 125 or so adult educators in the four buildings and the ways that networked technology affected the four domains of educational practice, professional culture, administration and policy, and family and community relations (Glesne, 1999; Miles & Huberman, 1994).

On every visit, I interviewed each principal and spent many hours observing throughout the school day in each location and met with teacher focus groups. I also observed key project events and interviewed individuals at the school and district level with a special relationship to the technology integration work. In addition, I have interviewed focus groups of students at each school, surveyed parents and students, and collected representative samples of drawing data from students (Schatz, Walker, & Widell, 1995). I took hundreds of photographs of technology in classrooms and schools as well as asked Hanau educators to provide photographs of events that they had taken. As a member of the implementation team fielded by TERC, I documented various meetings and activities, which were also rich sites of information on the technology integration work.

Data analysis was ongoing from the beginning of the project. After each visit, I reviewed all of the data collected, developing an initial set of memos and data representations, some of which were confidential for the use of the implementation team but many of which were shared with those at the site (Miles & Huberman, 1994).

I used the software program NUD\*IST for the organization of interview and observation data and to develop a consistent coding system that would allow me and my colleagues to look across a broad range of data to capture both convergent and divergent strands of thought. Our coding system was grounded in the four-part framework (educational practice, professional culture, administration and policy, family and community relations) designed to help us understand the systemic nature of various activities. In addition, I conducted separate analyses of photographic and drawing data (Collier & Collier, 1986). I reflected on these findings in an ongoing set of memos that helped me to sharpen my understanding of the technology-integration issues (Strauss, 1987).

Because the project extended over multiple years, I had the opportunity to develop my interpretations and then test them in subsequent interviews and observations. The role of the ET and the characteristics and activities of the individuals in that role were a topic that arose frequently in conversation with administrators and teachers over the years, and it was one that I probed and reprobated on different visits as I sought to build support for my conclusions (Maxwell, 1996).

Given the centrality of the ET to the success of the work, it is not surprising that I also spent a significant amount of time interviewing and observing individuals in this role. I was interested in the content of the work, the ways that individuals occupied the role, the reactions of educators across the schools to the individuals in this role, and the process by which the role evolved over time. I conducted 12 lengthy interviews over the first 3 years with the first individual to assume this role, Kevin McGillivray, plus several interviews in the subsequent years. In addition, I collected daily digital journals from McGillivray over a yearlong period, which I coded in the NUD\*IST database. I have also conducted several interviews (single and focus-group interviews) with McGillivray's peers in similar roles and gathered digital journals from his coworker Oren Eddy.

My work with McGillivray has provided me with a unique opportunity to explore the reflexive nature of the research process as I tested my conclusions for trustworthiness. Each interview was shared with him for his comments and corrections, as well as sharing the NUD\*IST coding of his digital journals, items for which he coined the term "NUD\*IST cookies." McGillivray's response to the NUD\*IST cookies provided me with a special lens by which to probe my interpretations of the role and its development (Wasser, 1998).

Although my role as researcher/formative evaluator and member of the implementation team from the stateside organization, TERC, offered me considerable access to the site and its activities, it also posed a number of problems in regard to ethics and trustworthiness that required constant vigilance on my part. With regard to the ET, this dual role raised its own set

of concerns. I had to be especially careful of the way that I positioned myself vis-à-vis technology and each individual ET, ensuring that I would be viewed as someone who could listen to all sides of various issues that emerged. Technology integration is not an uncontroversial process, and there were educators in the school who disliked technology and subsequently viewed their interactions with the ET in a negative light. Technology aside, personal likes and dislikes also dictated the success or failure of the relationships between educators and ETs.

I worked hard to solicit and hear a variety of views about the technology integration work and its good and bad points, deliberately spending time with people and in places that might offer an opposing view. That my interviews and observations include both the pros and the cons on a number of issues leads me to believe that I may have been successful, at least in part, in my efforts to represent the range of opinions available.

What is presented here represents a single case, which, in this case, comprises a single district. As is often true in qualitative research, breadth, the knowledge gleaned from multiple cases, is sacrificed to depth and duration, that is, the opportunity for an in-depth and long-term focus on one location.

This article is my attempt to answer fundamental questions about the position: What is an ET? How is the role constituted? To what degree is the process of constitution a reflexive process? To do so, I have drawn on basic sociological concerns of social structure, space, and time as the basis for an analysis of the role and the implications it raises for thinking about the emergence of roles that occurs as part of the process of school change.

### THREE LENSES ON THE EMERGENCE OF THE EDUCATIONAL TECHNOLOGIST: SOCIAL STRUCTURE, PHYSICAL LOCALITY, AND TEMPORALITY

In the following sections, I explore the ways the ET position came to be carved out within three dimensions: the social hierarchy and existing roles, the physical locality, and the temporal experience.

#### SOCIAL STRUCTURE

If the individual takes on a task that is not only new to him but also unestablished in the society, or if he attempts to change the light in which his task is viewed, he is likely to find that there are already several well-established fronts among which he must choose. (Goffman, 1959, p. 27)

The Hessen district, like most American school districts, is hierarchical in nature, with well-defined traditional positions. Within schools the dominating roles are those of principal and classroom teacher, and the persons carrying out these roles are surrounded by a cluster of specialists, ranging from school counselor and psychologist, nurse, and guidance staff to music, art, and shop specialists.

As ETs entered the schools, they needed to define not only who they were but also who they were not. Conversely, those with whom they worked, such as teachers and principals, also had to undertake a similar process. Thus, the emergence and stabilizing of the position was a highly reflexive process. “They [the school tech committee] are great at developing things for the [ET] to do, or think that the [ET] should do. They want [the ET] out scouting prices and I said ‘Whoa! Not his role! Not his role!’” (interview with principal, 1997)

There were four primary and competing definitions for understanding the ET position: the technician, the classroom teacher, the specialist, and the administrator. Later, a fifth competing definition arose: the ET as district curriculum specialist. Both the ETs’ understanding of these roles and the understandings that others held of these roles allowed these already existing roles to serve as imaginative resources for the creation of the new position, while at the same time they also served as restrictions to the development of the position. Interpretation, that is, creating meaning and definition around the ET position, built on these resources while confronting these barriers.

#### ET AS TECHNICIAN

The ET position had its roots in several positions—DESOC, school-based computer assistant, and computer teacher. Although instruction and professional support was a part of each of these earlier positions, the emphasis was heavy on the technical support of classroom technology. Thus, it was not surprising that in the early days of this project, most teachers and many administrators assumed that the role of the ET was to provide technical support. In those days, when teachers’ own technical skills were very limited, they expected ETs to set up their machines, find extension cords, and trouble-shoot minor technical problems.

The ETs had to find their own way toward elevating the issue of curricular planning as a part of their role as they emphasized greater self-reliance on the teacher’s part. “There’s not enough tech support. . . . I mean all this tinkering with configuring this . . . and ‘this doesn’t work’ . . . and ‘can you?’ . . . ‘I forgot my password’ . . . and those kinds of things are not really what I envisioned this job to be. . . . My only frustration, really my

only frustration with the job is how much time we have to spend with the tech stuff.” (interview with ET, 1997).

In the 2nd year of the project, the system developed the AT position. ATs have primary technical responsibility for the upkeep and running of the network and all its various technical extensions in each school. Originally located under the business wing of the system, this position migrated and eventually ended up with a stronger curricular emphasis under the umbrella of the superintendent. From 1998 to the present, sorting out the difference between an ET and an AT has been a major concern for ETs, ATs, and district and local administrators, not to mention classroom teachers trying to make use of their services.

#### ET AS TEACHER

Whereas in the beginning of the project the notion of ET as technician was a role that was overgeneralized, conversely the notion of ET as teacher was one that was undergeneralized. As technology integration moved forward, the interpretive work around the role of the ET forced to the surface a range of assumptions about teachers and teaching that had to be confronted if ETs were to be able to participate as teachers and curriculum leaders.

In most school systems there is a tacit belief that teachers of core subjects (math, literacy, science, and social studies) are the anchors of the school system, and those of specialty areas carry less weight. In elementary schools, classroom teachers are responsible for all core subjects, whereas in middle school and high school teachers specialize in one of the core areas. When one speaks of the role of teacher, it is often with reference to a core subject. Within the school hierarchy, technology falls outside of the core, and thus the technology teacher is located in the periphery of specialists. Although each ET had a subject area specialty (McGillivray, for instance, had 30 years of experience as a music teacher), their subject area was now being construed as technology, and technology was outranked by core subject area training. Indeed, for some classroom teachers, an antitechnology stance was sometimes part of one’s definition of oneself as a teacher in a particular disciplinary area. Understanding how an ET is a teacher has required reevaluation of one’s belief system in regard to one’s area of discipline.

Functioning as a kind of teacher, ETs hoped to work with teachers to plan technology integration for individual lessons as well as for an overall curriculum and to work side by side with teachers in the classroom and computer labs. Early on, however, it became apparent that few ETs or classroom teachers had sufficient knowledge or experience to work in this way. Building a climate of collegiality and the knowledge base for coteaching has been an ongoing process since 1995. To the credit of the

district and its educators, the notion of coteaching has taken deep hold and now flourishes (Wasser & McNamara, 1998).

The notion of the ET as a teacher was also influenced by the issue of school level. ETs worked across school levels, whereas many classroom teachers do not. Legitimate disagreements about content, procedure, or expectations between an ET and a classroom teacher were sometimes simplified by the classroom teacher into statements such as “They [the ETs] don’t understand my kids” or “They don’t understand how to work at this level.” At the same time, some ETs found themselves challenged by the requirement of working on a school level at which they lacked experience.

#### ET AS SCHOOL SPECIALIST

Whereas the teacher role in regard to the ET presented a number of difficulties, the role of the school specialist was, like the role of the technician, one that led itself to overgeneralization. School specialist positions, as they had been carved out in this district, fell into three areas: teachers of enrichment classes such as music, art, and physical education; teachers of remediation classes, such as reading, math, or special education; and health specialists, such as the nurse, school psychologist or counselor, and speech therapist.

The stereotype of enrichment or remediation class specialist was the role that ETs were most often forced to confront. The periods set aside for such classes are commonly referred to as off periods. Teachers reserve this time for attending to classroom and school administrative concerns, lesson planning and preparation, or personal needs. Teachers seldom, if ever, stay with the class for the specialty period. In making the assumption that the ET was such a specialist, teachers treated the ETs’ work with the same expectations; that is, they expected the ET to teach a separate computer class that would not require them to be present for that period. They also felt it was unnecessary to meet and plan the lesson with the ET. Many felt that the ET needed to claim and deliver the students at their door. When an ET suggested a different role for his or her work, some teachers were offended, even to the point of suggesting that the ET lacked the necessary professional skills for the position.

#### ET AS ADMINISTRATOR

Finally, ETs have also been compared to administrators. Like administrators, and unlike teachers, they are not confined to one classroom space throughout the day. Although ETs themselves do not have an individual budget, they command resources that have always been the province of the administrator (e.g., computers, cell phones, professional development

decisions). Also, like administrators, they must look school-wide at curricular needs, technical resources, and other issues. With respect to pay and civil service ranking, however, ETs are teachers.

Being compared to an administrator in a hierarchical system in which teachers and administrators are often at odds with one another was often not of benefit to the ET. Indeed, the comparison could be used to discredit the ET. Teachers, administrators, and the union used the red herring of the ET position as an administrative position to advance concerns of their own.

#### ET AS DISTRICT CURRICULUM SPECIALIST

As the mandate to integrate technology reaches deeper into issues of curriculum and instruction, the content of the ET position has raised contradictions about the role of the ET and the district curriculum and professional development counterpart—the curriculum liaison. What are the distinctions between these positions? What rights and responsibilities should each encompass?

These contradictions are exacerbated by the real issue of resource allocation. With technology ascending, many resources that might have once gone to curriculum liaisons (such as funds for outside consultants) may now go to ETs and their professional development activities. Thus, the interpretation of the ET position has led to a need to reinterpret the curriculum liaison position.

In the following two sections, I explore these issues of role definition in greater depth through an investigation of the ways space and time were shaped by the ET role and, conversely, how the emergence of the role reshaped space and time configurations within the schools.

#### *Space*

By space, I refer to the location of the interactions and activities that compose the content of the ET's role and the organization of those locales in relationship to each other in conjunction with the symbolic meanings given to those relationships. The ET's presence disrupted the use of various geographical and social spaces within and across schools. Because spatial organization is such a powerful media of symbolic communication, shaping the space that the ET role would occupy had critical institutional meaning (Dorst, 1989).

The ET role unfolded across multiple spaces. These included permanent work spaces, spaces devoted to the storage or location of technologies, temporary workspaces and work conducted in ephemeral spaces, that is, spaces that were assigned a particular meaning for the duration of an

activity. Moreover, ETs occupied real and virtual space. These spaces can be located in relationship to the range of arenas in which the ET was expected to have a part—technical, instructional, professional development, administrative, and community building, to name just a few. These activities take place in various regions of school life.

The space most closely identified with the ET was their home-base office in a particular school or schools. As DESOCs mutated into the ET role, the desk areas set aside for them in the district office also became associated with the ET role. For the ET, desk time is allocated to catching up on e-mail, searching out web resources, and solving technical problems through virtual mediation. Desk time is time spent in the back regions, in which ETs are not on stage front and center in active public performance of their role (Goffman, 1959).

In an interesting development, during the years McGillivray served as a Hanau area ET, his office in the Hanau High School, an area that was clearly designated as a back region, evolved into a social center for high school teachers. Furnished with a soft couch, coffee table, and rug and always stocked with cookies and his ever-brewing pot of coffee, year by year an increasing number of teachers found their way to the room to chat about a technology issue as they munched a cookie. McGillivray could generally be counted on to be there in the early hours before school started and often even after school.

During the day, ETs, however, spend relatively little time in the fixed location of their office or desk. Given that their primary mandate is the integration of technology into the curriculum, much of their time must be spent in classrooms working with teachers or in the computer labs or media centers with classes of children. The nature of the focus and interactions around curriculum varies with teacher and ET. In these settings, the ET must negotiate a role that recognizes the primacy of the classroom teacher and that teacher's so-called ownership of the students in the class, and, at the same time, acknowledges the validity of the ET's technical expertise and the value of technology to instructional activities.

The struggle to define the meaning of the role of ET as teacher was embedded in a powerful spatial image of the teacher as the owner of a classroom space and, equally important, the teacher's ownership or oversight responsibilities for the students in that class. Indeed, that the ET had an office, not a classroom, spatially associated the ET role with that of an administrator.

The ET role also came to be played out in what I have come to term ephemeral spaces, that is, spaces that have a designation for a short time around a particular activity associated with the ET role. ETs met with principals in their offices, ETs held training sessions for teachers or workshops for parents or community members after school in classrooms,

ETs attended implementation team meetings in school libraries, ETs assembled receptions in school cafeterias for visiting technology consultants, and ETs provided presentations to army leaders at the base commander's headquarters. In each of these spatial regions, ETs were required to negotiate their role under differing spatial conditions.

The ET role, although designed with an emphasis on the instructional side, because of its close relationship with networked technologies is closely connected with the spaces within the school and the district devoted to technical materials. Indeed, the nature of networking makes it like the invisible circulatory system of a school or school district. There are now hundreds of networked computers in the schools—at least two in every classroom and clumps of computers in labs and media centers. Behind the scenes, there are servers, wiring, cords, and stores of various technical components. These items reside in closets and other veiled locations. There are also army warehouses where technical materials come and go, repair centers, and various other outlets. ETs roam these technical domains with the special privileges associated with their emerging role.

In a role that requires numerous physical and mental transitions, corridors, that is, the places between places in which the ET was in transition, also became important to the notion of the ET. ETs were often hailed down in the halls as they moved from one location to another and asked to shift from one role (instructional perhaps) to another (technical). Conversely, an ET on the way from a meeting with parents concerned about technology uses (advocacy) might stop a teacher in the hallway to share information about a new Web site that would assist the teacher's curricular project (an instructional focus).

Another kind of transitional space that became uniquely associated with the ET role was that created by the cell phone. ETs worked across multiple locations. Even within one school, they moved from office to classroom and from classroom to media center, computer lab, and principal's office with great rapidity. Outside the school, they zipped around the large Hessen region, working in a range of different schools, as well as visiting warehouses, meeting at the district office, or transporting consultants or visitors to different locations. For this reason, cell phones became a necessity for locating ETs on a daily basis, and much of the coordination between ET and school administrators and faculty, as well as among ETs, occurred through the use of a cell phone.

ETs took varying stances toward the degree of access they permitted through the use of a cell phone. Some were always available, but others chose to limit access based on the kind of activity in which they were engaged. Thus, a technology that allowed ETs to close the gap of physical space with others could simultaneously, through the control of time, allow the gap to be maintained.

*Time*

As became evident in the prior discussion, the places that became associated with an ET's work had spatial and temporal dimensions. "Interactions of individuals moving in time-space compose 'bundles' (encounters or social occasions in Goffman's terminology) meeting at 'stations' or definite time-space locations within bounded regions" (Giddens, 1984, p. 112). Thus, one encountered an ET not only in a particular place but also at specific times in relationship to those places and the ET's role activities.

The temporal rhythm of the ET's day is unique to the position. An ET, like all individuals in a networked school, usually starts the school day by checking e-mail. From there, however, the day can include an hour with one teacher, an hour with a technical problem in the computer lab, a half hour of planning with the principal, and a couple of hours meeting with other ETs. On professional development days, ETs may spend the entire day in training teachers or planning technology integration. In the Hessen district, much time is devoted to driving because of the distance between schools. Day to day the schedule varies widely.

But like all K-12 schoolwork, the rhythms of this newly emerging work are coupled with the school day and the uses of time and space across that day. Even without a bell system, you can feel school time in school space—the pace of lessons (starting a lesson, collecting the exercises, conducting an experiment), the movement of children from homeroom to their daily special classes, the sounds of recess and dismissal. Because ETs work with multiple teachers across more than one school, they must be attentive to the rhythms of the individual and the school. They must also attend to the temporal rhythms of the school level at which they are working; an elementary school moves at different rhythms than a middle school.

For ETs, time also unfolds from an historical perspective. When ETs talk about the course of their work, they indicate the ways the content of the position has changed over time as the district networking mandate has expanded. Given the rapid evolution of the position, they are often frustrated with the tensions they experience from the nature and amount of expectations for their work and the ways that time-sensitive issues force their regular duties aside. As an example, during the 1999-2000 school year, which was the first year in which the ET position became district-wide and the district technology plan began to scale up what had been learned over the first 3 years of the project in Hanau, there were multiple implementations of administrative software entering the district. ETs were required to support the schools to ensure that the software was up and running and to help school personnel use the new programs for grading and other student personnel services. It required ETs to devote large

amounts of time away from their activities to support classroom learning, creating much tension within the ET group and between ETs and other groups. For the period of that year, these administrative implementations dominated the school calendar for the ETs, creating a special identity for that year in the history of the ET.

The rapidity of change, in the sense of pace, is a factor of time that ETs and their technical colleagues feel every day. "This is meatball surgery," said an AT, referring to an episode of the television program *Mash* to describe the hands-on, get-it-solved pressure under which all staff with technical responsibilities operate (interview, 2000).

### ROLE, REFLEXIVITY, AND SCHOOL REFORM

Up to this point, I have examined the ET role from within the realm of the ET, but this role was crafted from other roles, a process that occurred within a specific social milieu defined by specific time and space parameters. Thus, ET and non-ET, as well as foreground and background, were affected by the process of role formation described in the first part of this article. This reflexive development of role took place within and across individuals and schools and district/system concerns. Instances of role reflexivity therefore offer an important lens through which to view the impact of specific reforms and the relationship of those reforms to the system of roles within educational organizations.

One such instance of reflexivity was the development of coteaching.

### COTEACHING

Coteaching, referred to at an earlier point, is a homegrown form of professional development that emerged from within the technology integration work. In this approach an outside expert with expertise integrating technology in a core curricular area was invited to the schools to work with faculty both inside and outside classrooms. These visits would usually be initiated by a workshop in which teachers and ETs would be introduced to ways of using technology with that particular curricular area. The curricular topics were chosen to correspond to DoDEA. Following the workshop, teachers who had attended the workshop met with the consultant and planned a coteaching lesson, which would take place in real time with real students using the techniques discussed in the preworkshop. In preplanning teachers and consultant would work out the roles they would play in this work. Following the session, they would debrief on what worked and why. ETs supported the consultant, the workshop, and the coteaching experiences, providing technical and

logistical assistance as well as playing a variety of roles in the teaching experience, including coteaching. Teachers who had worked with the outside expert were then asked to share their knowledge and skills, becoming internal consultants and coteaching with others in the schools. Over the years principals and vice principals have also been included in this circle, and, like teachers, compensated for their participation.

As the project matured, the coteaching experience shifted away from being seen primarily as a technology-to-curriculum activity and was regarded more as a technology-and-curriculum activity. As this shift occurred, curriculum specialists came to take on a greater role planning the consultant visits with the ET leader and school-based ET staff. In fact, it would not be out of bounds to submit that coteaching, from many perspectives, has become the major professional development program of the district.

For teachers, long used to isolation in their teaching, coteaching was a powerful means of bringing them out from behind closed doors. As such, coteaching aided in the reshaping of teacher-teacher and teacher-administrator relationships within the schools, moving these roles from isolated and hierarchical to connected and more lateral. This and other experiences led one high school teacher to remark that the greatest impact of the technology integration work had been collegiality. Interestingly, whereas the presence of the ET in schools was initially viewed by some as a disruption to their role expectations, by the point in the study that this comment was made, the ET had come to be seen by many as the glue or link among many school roles and activities.

Coteaching and the opportunity to go back to the classroom and teach side by side with classroom teachers, led a principal to state to his administrative colleagues at a meeting: “[Y]ou principals who have not participated in the workshops and coteaching are missing the best part of this job—educational leadership! Get to a workshop right away!” (personal correspondence, February 22, 2002). Working side by side with ETs throughout the process of coteaching, many administrators came to view them as allies rather than as competing administrators, clearing the way for new partnerships, alliances, structures, and policies among ETs, administrators, and others in the schools.

As it succeeded, coteaching, initially developed as a response to professional development needs for technology integration, came to be intertwined with the range of district reforms underway, and, thus, the work around roles that was activated by coteaching also became connected with these new reforms. For instance, over time coteaching was taken up as the professional development approach for different curricular areas, extending its reach into such reform areas as standards-based curriculum, curriculum adoptions and the districts’ high-stakes

testing. As an aspect of school and district-wide approaches, coteaching, necessarily became a critical part of the school improvement plan (SIP) process, and documentation of the methods the district was using to meet targets and goals.

Coteaching offers a striking example of the ways by which role changes might accompany reform, and, indeed, might be seen as the enactment of specific reforms. It is important to note, however, that although role change and the interpretive work that accompanies that change appear to be critical to positive reform implementation, it is equally likely that role work is also a part of reform efforts with negative implementation processes and outcomes. It is not within the scope of this piece to describe how the nature of role work might differ between the two but simply to note the importance of role as an aspect of school change.

## MAKING SENSE OF ROLE AND REFORM

Two questions emerge from this review of the role of the ET: What can be learned here about role formation in school settings and is technology a special circumstance that cannot be generalized from when dealing with whole school issues?

### ROLE FORMATION IN SCHOOL SETTINGS

There are four critical points that emerge in regard to role formation from the case of the ET. First, the role of the ET was embedded in specific social, cultural, and historical contexts, and within these contexts, space, time, and social hierarchy represented the finite or defined resources from which individuals carved out their roles. In other words, roles were made out of roles. To create the ET role, ETs had to take bits and pieces that belonged to others. Often this meant appropriating the rights or responsibilities to social position, space, or time that were bundled within the role of another. In the case of the ET, the role of the teacher, administrator, technical assistant, school specialist, and district curriculum specialist were reworked to form the new position. The reworking of these roles required that they be in dialogic relationship with each other.

Second, role formation occurred within a narrativised landscape that unfolded over time. Much of the work around role formation was embedded in conversation, in which ideas about the work and the worker were illustrated through stories that connected the past to the present and the future. These narratives were related through numerous formal and informal conversations across the school. These chains of conversations can

be illustrated by the following example. An ET would work in a school one day, and the next day discussion of his work would come up in the lunchroom. Later in the day a teacher present at the lunchroom discussion would casually repeat a part of the evaluation for the secretary as she stopped in the office to copy some papers. The principal, working in her office with her door open, overhears the evaluation and stores it for future reference.

Third, roles are deeply entangled with the notion of identity. This means that roles are embodied, such that inner and outer worlds and physical and mental perspectives are comingled in role formation. ETs' efforts to make sense of their role had much to do with their struggle for an identity that would be acknowledged internally and externally. Power and status were critical pieces of this identity. In the development of the ET position, one could see underlying positions about the status of different disciplines in relationship to each other (was the ET a teacher of a core subject or an auxiliary subject such as music?), the status of different age/grades in relationship to each other (was the ET focused on upper grades or lower grades?), and the status or ranking that different individuals had accrued through personality or history within the system.

Finally, role formation was an individual and corporate activity. Each ET was unique in the cluster of technical skills and educational experience that he or she brought to the position, and each ET used these skills to develop a distinct identity and placement within the system. However, it was also true that ETs considered themselves and were considered by outsiders as a corporate group possessing an overall set of skills and attributes. ETs met frequently to work on shared projects or talk about their work, and these meetings provided many opportunities for them to work on their role and its definition and meaning. Conversely, non-ETs reflected on the ET from their various positions, using that perspective to share their understanding of the role and smoothing out a definition of the role that superseded the individuals occupying it.

The case of the emerging ET makes it abundantly clear that roles are resilient, in part, because they are never created out of wholly new conditions. Historically embedded, embodied, and defined from resources already owned by others, role change cannot help but be deeply challenging work for the individuals so engaged. Role creation or role repurposing causes dislocation in a primary sphere of activity, requiring much interpretive work from both individuals and groups. As the discussion on roles and reflexivity makes clear this role work is the work of reform, and, indeed, the success of reforms to take hold in different school cultures has much to do with the success of the interpretive work of those in roles related to the reform.

## CAN WE GENERALIZE FROM TECHNOLOGY TO BROADER SCHOOL REFORM ISSUES?

Technophobes would argue that the mere inclusion of technology makes our discussion a horse of a different color, that is, that it is incommensurable with discussions of school change in other arenas. Technology supporters, surprisingly, might agree with them, arguing that networked technology creates environments that are qualitatively different from non-networked environments and thus comparisons of school change across the two dimensions would be incommensurable. Each argument, however, has its limitations. Networked technology is one of many forms of technology to have entered the school system in the last century, earlier examples including the blackboard, the textbook, the film projector, the overhead projector, the ditto machine, and the stand-alone computer (Cuban, 1986; Davidson, 2001). There is simply no school that is not technologically contextualized (Ihde, 1990).

Indeed, what may single out the ET position as particularly interesting for the purposes of school reform is not its technology content but rather the ways it required vertical integration of the social hierarchy within schools. The ET role as described in this study required individuals in the ET position to work across all areas of a school in ways that resemble both an administrator and a teacher, roles that had previously been carefully separated from each other (Davidson & Olson, 2002). In this sense, the ET points the way to a new kind of educator role, one that integrates leadership and instruction and exists interdependently with school colleagues, much in the way that the new paradigm for leadership indicates will be critical for school improvement (Elmore, 2000; Gronn, 2000; Spillane, Halverson, & Diamond, 2001). These new perspectives on roles in school change emphasize the importance of practice as opposed to structure and the notion of interdependence among members of a school community.

## IMPLICATIONS: ROLE FORMATION IN SCHOOL REFORM

Systemic school reform comes in many guises from high-stakes testing and curriculum reform to site-based management and the growth of teacher leadership. Regardless of its form, such reform requires multiple kinds of role adjustments from those within schools. The issues raised here in relationship to the emergence of the ET role indicate many ways that we might look to role formation as a tool for more effective implementation of reform goals.

For instance, in discussing the success of school reform, the complexity of the role work involved is often masked by attention to narrow indicators of

success that can be expressed in simple formulas, such as those based on test scores (Cuban, 1998). The case of the emerging ET, however, points to the importance of role work as a process indicator in regard to the progress and sustainability of a reform effort. Indeed, the charting of role understandings and subsequent changes in these understandings could provide valuable information about the implementation of specific change and the likelihood that the change would become institutionalized.

The three classical dimensions—social structure, space, and time—offer useful perspectives in understanding the ways that change is incorporated within an organization, providing an almost inexhaustible store of riches to be mined. On a basic level one would need to ask, what are the existing roles—and bundled resources—that are being drawn on to develop this role? What are the space/time trajectories that become associated with the role? How is this role becoming contextualized within the system of existing roles, particularly roles seen as central to core instructional activities? These questions are the foundation from which one can then probe the relationship of role to reform in a particular site and the ways that emerging roles might be instrumental or not in the furtherance of reform. In so doing, one must, of course, guard against conceptualizing role as monolithic, which clearly it is not. Roles, like communities of practice, are overlapping and mutually constituting (Lave & Wenger, 1991).

Another important area is constituted by the narratives that accompany role formation and the various communication patterns in which narratives about the role are embedded. What stories are told about a new position and those with which it is interdependently woven? How has the role become embedded in the narrative of the school or district? How are these stories changing over time (Clandenin & Connelly, 2000)?

As I learned in studying the ET, there are multiple communication channels that weave throughout a school, and only a portion of them are direct, visible, and formal. There is an equal if not greater amount of communicative material moving through a school that is shared informally through more or less invisible channels, and these informal channels have great importance in understanding the success or failure of any attempt to reshape roles. In regard to roles, what narratives, for instance, flow on one channel and not the other, and why?

Up to this point, I have approached the issue of role as something fairly well contained within a school or district, but it is equally important to consider role as an aspect of relations with others who are virtually, but not physically, present in time or space (Nespor, 1994). The presence of networked technology in a school is particularly symbolic of a host of far-flung relationships among such global technical concerns as hardware and software manufacturers, energy firms, and policy makers, not to mention

advocacy groups, curriculum developers, and parent concern groups. School renewal represents internal changes that intersect with social issues and concerns in the world surrounding schools. In thinking about the evolution of a role, it will be important to describe its shape, form, and content in relation to outside demands such as politics, social theory, and other critical intersecting paths, as well as the inside demands exerted by students, colleagues, and school structure.

The sociology of science literature with its concerns about the intersection of social organizations and large technical systems offers special resources for exploring these issues (Davidson & Olson, 2002). In particular, the notion of translators “who function at the interfaces between the interacting systems, translating the information generated in one system into a form intelligible to participants in other systems” (Gokalp, 1992, p. 7) could be of use in the work of mapping and understanding role change in schools. Although this concept is readily applicable to the ET, it might also prove interesting to apply it in broader circumstances to a range of roles. For instance, how might a reading teacher serve as a translator between the technical systems represented by publishers and the social organization of schools, and what would be the implications of developing this role within a school (Davidson, 2000)?

Role work can serve as a rich form of professional development. In studying the ET, I found that my interviews—conducted with the same individuals over a period of years—came to serve as a form of professional development in which role questions, and the accompanying tensions and concerns of reformulating a role, were explored and worked through. Busy school schedules allow educators little time to stop and reflect on such topics, and, indeed, taking time to talk about such issues can be seen as self-indulgent. Yet many of my interviewees have remarked on the importance of this opportunity to reflect on their changing roles.

As was stated earlier, this study is constrained by the fact that it represents understandings gleaned from a single case. The conclusions presented here should be explored in a range of locations that present different conditions, structures, and reform trajectories. The questions listed previously offer many possibilities for this future research. Roles are social locations in the geography of schooling—the nodes where the personal and the structural intersect within an organization. As we seek to change or improve schooling, certain positions will inevitably need to be relocated or eliminated, while other positions emerge.

The Hanau Model School Partnership, and the emergence of the ET as a force within the schools, provided an opportunity to take a close look at a new role emerging within a district and to consider the relationship of this role to the ongoing school reform efforts represented by technology integration. The exploration of role in complex school settings can teach a

great deal about how fundamental change must be integrated in any meaningful school reform.

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