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TECHNOLOGY IN THE CLASSROOM: THE ROLE OF DISPOSITIONS IN TEACHER GATEKEEPING

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As sophisticated electronic learning technologies become standard features of schooling, advocates envision a wider, richer range of educational experiences and more student-centered learning. Enthusiasts predict such uses will change the roles of students and teachers.(FN1) Before such claims can be evaluated, however, teachers must accept and use technology in their classrooms.

We do not yet understand how teachers interpret the prospect of technological innovation. Summarizing a series of studies on classroom computer use, Sheingold, Hawkins, and Char conclude that more research is needed to understand the processes that determine change in the classroom culture.(FN2) Ehman and Glenn find little research that examines the impact of technology on the teacher's role.(FN3) They advocate studies featuring in-depth teacher interviews and observations. This study uses such methodologies to explore secondary teachers' perceptions of educational technology and its role in their classrooms.(FN4)

Schools have been resistant to curriculum innovations. Although researchers have identified school organizational structures and societal expectations about schooling as significant barriers to innovation, many studies highlight the key role that teachers play as the gatekeepers of classroom change.(FN5) Research suggests that teachers will accept only changes that they perceive will help them do their job as they have defined it.(FN6)

Authorities in curriculum development have recognized the key role of teachers in curriculum reform. For example, Schwab identified four curricular commonplaces that must be addressed in all curriculum development: learners, subject matter, milieu, and teachers.(FN7) Caswell argued that the primary means of changing the curriculum is changing teachers.(FN8) Both of these individuals understood the difficulty of gaining teacher support. They stressed the importance of involving teachers in defining needs and planning implementation. Recognizing that the mainstream teacher culture is conservative and adverse to risk, Caswell emphasized the need for security and recognition if teachers were to entertain the uncertainty of change.(FN9)

Although theorists recognized the problematic nature of curriculum implementation, researchers did not begin to focus on understanding the process of school change until the late 1960s.(FN10) Three perspectives typified curriculum implementation research for the next two decades: the technological, the political, and the cultural. House argued that although these perspectives coexist, the research emphasis has shifted over time from focus on the innovation itself, to the innovation in context, to the context itself.(FN11)

The technological perspective gained prominence in the 1960s and was based on systematic development, dissemination, and adoption of knowledge. The research focused on the degree of fidelity to the original implementation plan. Assuming that the teacher was a passive consumer who shared their values, developers expected disseminated information to stimulate any reasonable, intelligent teacher to try new ideas. As it became obvious that teacher behavior did not fit the rational adopter model, strategies shifted to efforts to bypass teachers with teacher-proof materials.(FN12)

In the 1970s, the political perspective of curriculum implementation gained credence. This framework views implementation as a process of mutual adaptation among factional groups such as developers, teachers, and parents. Negotiation and compromise between innovators and local interest groups are expected.(FN13)

The cultural or ecological perspective emphasizes the context in which the innovation takes place. It considers the values, norms, and assumptions of various cultural groups and the ways those concepts are shaped by the social setting. By understanding contextual impediments to change, its advocates

expect that more effective implementation policies can be planned.(FN14)

More recently, some researchers have begun to advocate a fourth theoretical framework: the personal perspective. They argue that research that concentrates on the innovation process but neglects the expected innovator provides a limited view of curricular change. The personal perspective focuses on individual teachers' careers, belief systems, and thinking about their practice.(FN15)

Studies from the personal perspective have found substantial differences in how individuals respond to classroom change. Much of the variation seems associated with differences in beliefs and dispositions. Teachers' professional knowledge seems to be deeply experiential and personal rather than theory based.(FN16) When teachers lack adequate information to make a decision, beliefs about education and teaching appear to guide their actions.(FN17) Nespor argues that beliefs are not open to argumentation and evidence.(FN18) Research suggests wide variations in teachers' beliefs--even among those working in the same schools, subjects, and general instructional schemes.(FN19)

Smith, Kleine, Prunty, and Dwyer maintain that innovators exhibit personality dispositions that differ from those of other teachers.(FN20) Schlechty argues that different types of teachers have different needs that must be considered in curriculum restructuring. He conceptualizes five teacher types varying in their tolerance for risk: trailblazers, pioneers, settlers, stay-at-homers, and saboteurs.(FN21) Some work by psychologists supports such notions. For example, Rokeach found that individuals with closed-minded personalities were extremely resistant to change. He theorizes that their behavior was a defense against the threat of the uncertainty. Unlike individuals with open-minded personalities, they did not demonstrate a great need to understand the unfamiliar.(FN22) Day and Berlyne conclude that individuals vary in their tolerance for uncertain situations and their willingness to expose themselves to change. Those with curious personalities seek stimulation and challenges and are willing to face adversity and take risks.(FN23) Studies using the Myers-Briggs Type Indicator (MBTI) have found strong relationships between MBTI psychological type scores and the way teachers teach. These studies suggest that the majority of teachers prefer order and adherence to established norms and resist spontaneity and change.(FN24) In a finding related to technological innovation, Katz claims that computer use is associated with a tolerance for risk and proposed a personality profile for the typical computer user.(FN25)

How amenable beliefs and dispositions are to change is unclear. Specifically problematic is how the two factors interact to influence teachers' responses to innovation. Little is known about how teacher beliefs develop, how they are reinforced or weakened, and how they can change.(FN26) Day and Berlyne could not determine whether curiosity is inborn or is developed but noted that some studies have found differences in curiosity among infants.(FN27) Both Rokeach and Day and Berlyne found that personality traits were not related to intelligence.(FN28) However, Rokeach noted that individuals with "closed" personalities have greater difficulty forming new conceptual and perceptual systems. Some researchers have concluded that teachers' underlying educational philosophy must already match that of the proposed innovation before they can accept, or even truly understand, a curriculum change.(FN29) However, beliefs alone may not be sufficient for some teachers to embrace particular curricular reforms. With respect specifically to educational technology, Honey and Moeller found that even teachers who shared progressive pedagogical views differed in their willingness to risk the uncertainty of technological innovation.(FN30)

If the chances of educational reform are to be enhanced, understanding more about how innovative teachers differ from their peers is particularly important. Technological, political, and cultural research perspectives consider teachers in aggregate groups and seek common tendencies. Because they focus on norms, they offer little insight into individual variation. This study adopted a personal perspective to

explore the meaning of technological innovation for individual secondary school teachers and their classrooms.

STUDY DESCRIPTION AND METHODOLOGY

From 1979 through 1991 I was a teacher and a member of the technology planning group at Glenbrook, a secondary school engaged in technological innovation.(FN31) As an advocate of student-centered learning, I expected that technology would encourage the establishment of empowering learning environments. Such environments offer choices in how information may be accessed and manipulated such that students can solve problems and construct personal meaning in ways that make them more competent, independent decision-makers.(FN32)

Casual observations left me uncertain about how teachers used technology in their classrooms. My curiosity evolved into a three-year (1992-1994) study of Glenbrook teachers' uses of technology. Although the Glenbrook innovation effort centered on computer-mediated technologies, I considered electronic technology more broadly to include relatively "low-tech" tools such as calculators and VCRs as well as sophisticated "high-tech" multimedia machines. The study is premised on the assumption that the sophistication of the hardware does not determine its potential for educational reform. Teachers may use either simple or complex technologies to assist them to achieve their individual visions of good educational practice.

During the early phases of the study, I discovered two quite different patterns of technology use. Some teachers welcomed technology as a vehicle for empowerment. In their classrooms, technology facilitated active, student-centered investigations. A greater number of teachers employed technology to reinforce traditional, teacher-centered practices. This report documents efforts to understand the substantial differences in teachers' technology decisions. It has two purposes: (1) to describe teachers' perceptions and uses of technology and (2) to suggest a teacher typology to explain some of the observed differences among teachers.

SITE SELECTION: A CRITICAL CASE STRATEGY

Glenbrook is a small boarding school (6-12) in a rural area of the southeastern United States. Its students display a wide range of abilities and come from varying home environments and hometown settings. Many are underachievers. Few come from households shared by both natural parents. Several philanthropic organizations provide the school with generous funding. The school has focused these resources on high-priority goals: scholarships for the majority of its students, low staff-to-student ratios, and a substantial installation of educational technology.

When a research study is limited to a single site, its selection may be justified by the choice of a critical case, a close approximation of an ideal case profile. Such a case may be identified by the logic, "If it won't work here, it won't work anywhere."(FN33) Because many of the elements identified as critical to successful technology programs were present, I considered Glenbrook to be a critical case.(FN34)

DATA COLLECTION

Using multiple collection methods, data was triangulated from a variety of sources (see Table 1). Initial and follow-up teacher interviews focused on perceptions and uses of technology, life experiences, and beliefs about teaching and learning. Student and administrator interviews, classroom observations, and teacher surveys tested interpretations of teacher responses.(FN35)

All 10 teacher respondents were Caucasian and ranged in age from 31 to 55. Seven were male. Eight had been teaching for at least five years. Death and job change caused the loss of two respondents before observations and follow-up interviews.

Initial teacher interviews suggested two very different patterns of technology use among teachers. Three of the eight remaining teachers were selected for in-depth observation based upon that analysis.

Oscar and Felix were chosen as the strongest exemplars of each pattern. Sam was included because his responses indicated no dominant pattern. He served as a discrepant case to test the viability of categorizing teachers based upon the two patterns of technology use.

I observed at least two classes of each of the five teachers not scheduled for in-depth study. One lesson emphasized technology and one did not. Additional spot checks verified that both technology and nontechnology lessons were representative of each teacher's practice.

DATA ANALYSIS

I tabulated survey data and analyzed field notes and transcriptions of audiotaped interviews. This analysis sought to identify how and why teachers accepted or did not accept and use educational technology. I used a form of analytic induction to develop theoretical categories and the relationships among them. In analytic induction, the investigator scans all data from initial cases and develops working categories and hypotheses. These emergent constructs guide further data collection strategies (theoretical sampling). Successive data collection and analysis should test emergent hypotheses by a deliberate search for confirmatory cases and for disconfirming cases that do not fit established patterns or interpretations. Each time a discrepant case is found, the categories are adjusted to account for the discrepancy.(FN36)

I reviewed as a unit all data from first (Phase I) interview transcripts and developed relationships and patterns. As broad outlines of the analysis emerged, I considered how the emerging patterns might be related. I grouped data from initial cases based on the questions I had asked about technology use. I considered as a category each statement that identified a use factor and then coded interview transcripts for categories. Once provisional categories were established, enumeration of the frequency of their occurrence clarified, focused, and refined the typology. Because emerging constructs may be contaminated by prior literature review,(FN37) I did not begin an active search of relevant studies in the literature until substantive theory had been generated from Phase I data.

Subsequent study phases (II-IV) used several strategies to challenge initial explanations and correct for teacher and investigator bias by checking information against the accounts of other respondents and against my observations. Data analysis and an ongoing literature review raised questions about theoretical constructs that guided sampling in successive data collection phases. To enhance confidence in the emergent theory, I gave deliberate attention to the identification of discrepant cases and to the generation and testing of alternative or rival explanations for patterns in the data.(FN38) Finally, I used follow-up conversations and a teacher survey to seek respondents' confirmation of constructs and theoretical explanations.

My association with teacher respondents raises reasonable concerns about validity and reliability.(FN39) Although I stressed that my research was independent of the school, my former roles as teacher and colleague may have affected respondents' answers. I have been very conscious of the necessity to base conclusions on the data; however, coloration by my past school experiences cannot be discounted. On the other hand, my past roles offer the benefit of a long-term perspective on the study setting.

FINDINGS AND DISCUSSION

Initial analysis of exploratory study (Phase I) data suggested a model for the process of teacher acceptance and use of technology. That model emphasizes differences in teachers' dispositional tolerances for uncertainty. Based on initial interview responses, I conceptualized a dispositional typology for teachers. Data from subsequent phases demonstrated strong internal consistency and supported major expectations arising from the emergent dispositional typology.(FN40) A second group of faculty (Phase II) reflected the tendencies of the first. Observed teacher behavior supported major expectations arising from interviews and the emerging model. Teacher survey rankings of technology goals

substantiated the interpretations made from teacher interviews and conformed to observed behavior. Students confirmed faculty reports of technology use.(FN41)

Despite its general appearance, the model represents only an initial step in a theory-generation process, not a verified product. The data on which the model is based come from a small group of teachers in a particular setting. The study findings are not generalizable; they are suggestive only. Consequently, the model must be understood to represent a set of tentative explanations that merit future exploration in other situations.

Figure 1 depicts the model for teacher acceptance and use of technology. The Glenbrook data suggest that when the possibility of technological innovation is raised, teacher decisions pass through two stages: first, certain general conditions must be met before teachers will admit technology into their practice. Once teachers have accepted technology, individual teacher characteristics will determine how technology is used in each classroom.

GENERAL FACTORS AFFECTING TECHNOLOGY USE

Teacher responses suggest that four prerequisites must be met before teachers will accept and use technology. Specifically, adequate informational, material, and leadership resources must be present, and teachers must have some sense of obligation to prepare their students for an increasingly technological workplace.(FN42) Beyond provision of material support and assistance from technology specialists, the key resource that teachers seek from leadership is release time to master and experiment with technology and to plan for incorporating it into their practice. Other studies support the importance of such factors.(FN43)

The prerequisites that teachers seek are largely structural and organizational needs that are controlled by decision makers outside the classroom. The model acknowledges the power of such ecological variables on teachers' beliefs and behavior.(FN44) However, operating within the same environment, individuals respond to technological innovation in quite different ways. Teachers differ in when--or if--they perceive prerequisite factors to have been met. More importantly, individuals may differ greatly in the goals they pursue with technology once they have decided to use it.

GOALS FOR TECHNOLOGY USE

All Glenbrook respondents accepted technology to some degree. Four goals for technology emerged from analysis of teacher interviews and were confirmed by observations and surveys: control, empowerment, enrichment, and efficiency (see Table 2). Controlling and empowering uses are mutually exclusive. Enriching and efficiency uses may serve simultaneoulsy either control or empowerment functions. All teachers pursued enrichment and efficiency goals. However, clear patterns of preference emerged for either control or empowerment.

Control vs. Empowerment. Felix and Oscar exhibited the greatest differences in their goal emphases. Felix emphasized control and efficiency:

The less time I have to turn and put things on the board, I think that helps me control the class.... With the LCD display panel, a lot of things I put in the computer, then I could just display that up.... Then I have control of it and everybody can see it.

Oscar was the strongest advocate for empowerment:

In my social studies classes, I don't even have a classroom right now. They go to the library ... Half of them will go to the computer lab, while others are in the AV room trying to rehearse and record a script. It [technology] has changed my classroom from just them sitting at their desks being lectured to or working on maps, to where they are spread out over the whole building to whichever room they need most that day.... To me, that's so much a better way to do education: getting a child involved.

The other teachers' emphases fell between those of Felix and Oscar on the control-empowerment

continuum. For example, June's thoughts typify the teachers' internal conflicts about the best uses of technology: "It responds so quickly to what they [students] are doing, and they are curious--which I think is good--but there are times when that [independent exploration] is not what you want them to do."

Efficiency. Teachers commonly valued the efficiency of technology. They most frequently cited word processing and increasing research productivity as examples. Felix envisioned that drill and practice programs would extend his instruction time. William showed videos of Shakespearean plays because "you can do so much more ... This year we did [studied] eight plays."

Enrichment. All teachers perceived enrichmentas a powerful use of technology. Several reported seeing students "light up" when they heard and saw the sounds and pictures available on CD-ROM and laser discs. Again, the greatest difference was observed between Felix, who almost always conceived enrichment uses in a controlling context, and Oscar, who routinely conceptualized enrichment in an empowering environment.

SUMMARY

Contrary to the expectations of many advocates, study data suggested that acceptance of educational technology may not imply a radical shift in educational practices. Although some teachers appeared to have embraced its potential for alternative approaches to schooling, others adapted technology to bolster traditional, teachercentered instruction. Between the extremes, some teachers seemed to remain ambiguous about their perceptions of the most appropriate uses of technology. What might account for such different decisions about technology's role in the classroom? Efforts to understand this phenomenon resulted in the generation of a teacher classification scheme: Accidental Tourists and Voyageurs.

SEEKING COMFORT: ACCIDENTAL TOURISTS AND VOYAGEURS

Exploration of respondents' thinking about technology and teaching revealed patterns of difference that may affect their preferences for controlling or empowering uses of technology. In the analysis of initial teacher interviews, I was struck by how teachers consistently explained their technology decisions in terms of personal comfort. Each respondent noted a particular mix of technology goals that seemed to provide a necessary comfort level for that teacher.(FN45) Although each mix appeared to be unique, individuals' statements suggested clusters of teachers with similar goals. Theorizing that those patterns were related to a dispositional tolerance for uncertainty, I conceptualized a dispositional continuum bounded by ideal types that I labeled Accidental Tourists (AT) and Voyageurs (VG).

The Accidental Tourist metaphor comes from Anne Tyler's novel about reluctant travelers who desperately seek to domesticate any unfamiliar destination.(FN46) They appear to need predictable familiarity. AT teachers, when confronted with educational technology, seek to minimize potential disruptions in their normal, comfortable routines. If technology must come into their classrooms, they will find uses for it that reinforce, rather than challenge, their established patterns of classroom interaction.

Voyageurs were French adventurers in 18th century Canada who ferried people and goods into the wilderness and back again. Chafing at the structure of civilized society, they relished risk and unpredictability. VG teachers exhibit a similar need for personal challenge. Educational technology stimulates them to explore and experiment with new approaches to expand the possibilities of schooling.

The AT-VG typology summarized in Table 3 emerged from analysis of initial interviews and was refined over the course of observations, surveys, and follow-up interviews. However useful, the AT-VG continuum should not be understood to reduce the complex responses of teachers to simple, dualistic categories. Rather, this continuum provides a heuristic tool to use when considering similarities and differences in participants' responses to technology and classroom change.

Initially, I placed teachers on the AT-VG continuum on the basis of their interview responses. Classroom observations tested these decisions. Using the characteristics predicted by the AT-VG model,

I focused my observations on lesson format, lesson content, and classroom climate and subsequently adjusted placements to account for discrepancies between responses and behavior. Observations tended to move most teachers closer to the AT end of the continuum than their reports predicted. Despite a general shift toward the AT pole, the relative placement of teachers along the continuum underwent no radical changes.

Three teachers demonstrated tendencies that suggested strong AT commitments. Only Oscar seemed committed fully to the VG perspective. Although two other teachers exhibited substantial VG tendencies, they did not seem as committed to that perspective as the strongest AT respondents. The remaining teachers clustered toward the middle of the continuum, with all demonstrating substantial ambivalence toward the Voyageur style. Although the teachers varied in subject specialties, teaching experience, age, and gender, none of these variables appeared related to AT-VG tendencies.

Several underlying factors are incorporated into my conceptualization of the AT-VG typology. The following sections describe evidence of substantial differences between AT and VG teachers in their perceptions of teaching and learning and in internalization of schooling norms and standards.

Perceptions of Teaching and Learning. Consistent with their AT-VG rankings, respondents showed varying degrees of support for one of two general orientations toward teaching and learning: Serious Business and Learning as Adventure. The first orientation reflects the formalistic, expert-centered perspective of what may be called the traditional paradigm for education. The second suggests the experimental, learner-centered assumptions of a competing vision, the constructivist paradigm.(FN47)

Felix, the strongest Accidental Tourist, was the foremost advocate of Serious Business:

They expect so much more because of the things that computers can do, sometimes real science is almost blasé to them.... Because computers can do so much more as far as putting on a show for them.... I don't look for the technology to help motivate or help entertain students. That's not my goal.

Other AT teachers reflected similar tendencies. For them, technology use did not possess the legitimacy of traditional--serious--learning. Sam worried that it might take away time from content coverage. Barry was concerned that technology would "get away from what I think education is: getting people to learn how to read and write."

Oscar, the strongest Voyageur, evidenced Learning as Adventure in describing a multimedia project in which students developed a simulated newscast:

It just piqued their interest enough to where they ... were excited about their work.... It's almost like education came secondary in their minds, but it served my purposes as a teacher. They were learning the material, but it was in a way that was fun to them ... I think they will really learn it. It won't be just learning something for a test that they'll forget.

Similarly, Lucy envisioned technology use as

more and more them [students] taking the ball and going with it as far as--I give them a theme, or maybe they even come up with the way they're going to present it, whether it's a debate or a play.

June observed that technology "speeds up what kids can do; it enables them to explore."(FN48)

AT teachers' uses of technology were clearly delineated, utilitarian applications: essentially content transmission, drill and practice, word processing. In part, these teachers legitimated technology use by its contribution to vocationally transferable skills. Common to Voyageur uses of technology was an element of playfulness. Voyageurs recognized technology's attraction to students and sought to use that excitement to link play and learning in unconventional educational experiences. In contrast to AT use of technology as a control and productivity tool, VG teachers sought to harness technology as a tool for thinking and adventuring. For example, Oscar sought software "where students are working through almost like the first scientist: start at the beginning and discover knowledge for themselves."(FN49)

Conserving Behavior. AT and VG teachers demonstrated substantial differences in their engagement in conserving behavior. This type of behavior values time-tested methods and traditions without questioning whether or not such procedures may be obsolete or inefficient. Sam (AT) identified conserving behavior when he spoke of teachers who "have had success in certain things for a number of years, and they're wondering why they should change." Felix demonstrated such thinking when he observed: "From the standpoint of pure science there's really very little to gain from using computer technology, I guess." Pressed for an optimal use of technology, he envisioned a monitor linked to a microscope so that he and the student could view the same slide. He explained that "the student would still adjust everything [on the microscope]." Although he had seen videodiscs showing enhanced views of microorganisms, Felix did not consider the possibility that new technology might offer better quality or more interactive instructional views of microscopic matter for students. He assumed learning to manipulate a microscope would remain a necessary skill for success in high school biology. Reflecting similar tendencies and a view of the centrality of the teacher, William routinely used grammar drills in his courses but would not consider drill and practice software because "they would get bored without the human touch." Other studies of teachers have noted conserving tendencies similar to those reported here.(FN50)

In contrast, Voyageurs expressed dissatisfaction with current practice. Although most were not as student-centered as they stated they wished to be, technology was part of their vision for evolutionary growth toward student empowerment. Nancy's criticisms of traditional procedures were the most pointed. She advocated unrestricted use of calculators after 7th grade such that teachers could focus attention on higher mathematics. She did not worry about the possible deskilling of students who had not mastered arithmetic:

I'd rather have them walk with a crutch than not walk at all. The downside is the way we test them. If we are going to give them the tools that change the way they act and behave, then certainly we ought to test them that way, or else not test them at all!

REFINEMENTS IN THE AT-VG TYPOLOGY

This typology predicts that Accidental Tourists will avoid ambiguous, inquiry-oriented classroom interactions that raise uncertainty levels. Teacher dispensation of lower-order rote learning creates less exposure and risk for all parties. Consistent with expectations, observations of teachers at work confirmed substantial differences in the classroom choices of Accidental Tourists and Voyageurs. However, such observations also suggest important variations among those with similar general orientations. Felix and Oscar are closest to the model's ideal types. Contrasting their classrooms with those of three teachers with less pronounced tendencies illustrates differences between and among members of the AT and VG groups.

Felix: The Accidental Tourist. Felix's class featured an almost pure form of teacher-centered, lower-order transmission of facts. Lecture, seatwork, and recall quizzes typified his lessons. Few questions were asked by students or the teacher. Each class was predictable and orderly. Felix was the only teacher not observed using technology with students. His sole student technology activity for the quarter was one day set aside for the word processing of laboratory notes.

Technology stood apart from his instruction. Although he spent at least 90 percent of class time in the classroom, his computer was located in his science lab. I observed him using that computer during his planning period more often than any other teacher. He used technology as a professional productivity tool to keep grades and to make lesson plans, tests, and worksheets.

Oscar: The Voyageur. Even when they were teacher-centered, Oscar's classes were highly interactive. He incorporated student responses into evolving lesson structures that required students to

go beyond recall to the application of principles and the testing of hypotheses. Students in all of his classes pursued independent projects as Oscar advised rather than dispensed content. For example, several groups worked in the computer lab on hypermedia presentations. Activities became hectic as groups worked through conceptual frustrations and collaboration problems. Oscar appeared unruffled as he circulated among groups to mend fences and to nudge students toward alternative solutions.

In Oscar's classes, students were responsible for solving project problems. One group inadequately conceptualized a screen designed to assist the user. Rather than telling them what was wrong, Oscar modeled user thinking. He read through the screen instructions aloud and performed the required operations. Because instructions were incomplete, the next screen did not appear. He repeated the process, talking his way through the procedures. After a third try, he smiled at the group, shrugged, and walked away. Such episodes suggest a high tolerance for uncertainty and an expectation that students can and should learn in ambiguous, experimental, student-directed settings.

VARIATIONS WITHIN AT AND VG GROUPS

Observations of three other teachers demonstrated substantial variation within groups of teachers sharing general orientations. Sam's teacher-centered classes featured structured lectures, but, unlike Felix, Sam attempted student involvement through questioning. However, his recall-based questioning lacked the flexible incorporation of student responses evident in Oscar's lessons. In several cases, students sought to go beyond factual recitation to discussions of problematic issues. Each time, Sam blunted any potential for controversy and returned students to recall tasks. Sam's lessons suggest a stronger AT orientation than his initial interview responses. He claimed that he valued higher-order analysis and evaluation. Perhaps dispositional tendencies dampened his goals and steered Sam from the uncertainty implicit in higher-order activities.

Unlike Felix, Sam incorporated technology into his presentations. Most typically, his use of videotape or videodiscs simply replaced the teacher as transmitter of content. Students used viewing guides that emphasized discrete facts, and the video ran from beginning to end. He never used the nonlinear and instant-access capabilities of the machines. In fact, Sam actively resisted such uses. For example, on a day that the class resumed viewing a videodisc begun the previous day, Sam repeatedly tried to find the place at which the previous day's viewing had ended. A student offered to show him how to go to the exact spot on the disc. Sam firmly refused the student's assistance and persisted in his time-consuming search.

Although Oscar also used the enrichment potential of laser discs and CD-ROM, his uses of video and hypermedia for student empowerment suggest radically different goals from those pursued by Sam. In Oscar's class, technology provided a diffused, second instructional stream that was directed by individual students. In Sam's class, technology substituted for the teacher in the transmission of a single, structured, factual stream. His technology choices seem consistent with his avoidance of substantive discussions. Earlier, Sam voiced concerns about classroom management. Such anxiety may have shaped or reinforced his desire to remain in control as the clear knowledge authority and class leader. Both serious discussion and open-ended uses of technology introduce ambiguity that blurs those roles. Teachers with high control needs may find such uncertainty unacceptable.

In contrast to Sam, both Lucy and Nancy exhibited some strong VG tendencies. However, each manifested individual requirements that restrained her from maximizing the empowering potential of technology. Lucy seemed to be restrained by her perception of the teacher as knowledge expert. Like Oscar, Lucy engaged her students in cooperative, student-centered projects. However, projects used only low-tech applications (e.g., tape recorders, camcorders, simple word processing). She was reluctant to experiment with more sophisticated technology applications in her teaching until she felt that she had

complete understanding and mastery of all of the equipment and software her students might use. She regarded the need for prior mastery as a weakness: "Why can't we all learn it together, instead of me feeling that I have to be so proficient and number one, and then I can teach them?" Lucy's frustration suggests the degree to which tolerance for uncertainty may influence teacher behavior. Like Oscar, she values adventurous learning; she questions traditional methods. However, her reluctance to risk her role as expert reduced her options to harness technology for students' empowerment.

Nancy used scientific calculators and a computer with a projection display as efficient tools for inquiry. This gave students time to experiment with more instances, to discover patterns, and to test hypotheses. Their learning was experimental and ambiguous. Her tolerance for the possibility of exposing her own knowledge to risk and for learning with her students seemed greater than Lucy's. She observed that it was "so much more fun [for her and her students] doing math with a scientific calculator" because students discovered things that no one in the class--including she--knew.

However, unlike Oscar's or Lucy's class, Nancy's class explored as a group. Willing to share the expert's and the learner's roles with students, Nancy was uneasy about sharing class leadership to the degree required by independent learning. She explained that she was uncomfortable with independent projects and wanted everyone in the class to advance together.

Her responses suggest that some teachers with VG tendencies may give higher priority to goals other than academic empowerment. Like Oscar and Lucy, Nancy wanted her students to experience the excitement of learning. On the other hand, her primary goal seemed to stress communal sharing of a teacher-controlled adventure rather than individual empowerment and experimentation. She recognized that technology allows individuals to "just go off and build on what they've done." She did not encourage it: "It's not something I've suggested." When such venturing occurred, she tolerated it, but she did not integrate such experiences into her instruction.

Technological empowerment for Nancy was group empowerment. She valued technology because it lowered risks for poor performers: "Now they're not afraid to call out an answer. If they make a mistake ... they can just say, 'I didn't enter it right.' ... It equalizes everybody." Technology brought everyone into the group and allowed shared learning adventures.

The variation exhibited among those within the AT and VG groups emphasizes the complexity of tolerance for uncertainty. Beyond a tolerance for ambiguous classroom interactions, we must consider willingness to risk professional roles. Nancy's and Lucy's differing responses highlight the distinctiveness of two areas of risk for teachers and suggest that some teachers have different risk tolerances for expertise and authority. Further, Sam's and Nancy's technology uses imply that other, possibly more important, goals may interact with technology goals to determine technology's role in the classroom.

These complex interactions seem likely to affect even the level of prerequisite support needed by each teacher. Oscar was the only respondent without a classroom computer. Still, he went out of his way to incorporate innovative technology into his classes with minimal support. Sam taught in a classroom equipped with three computers, each loaded with a range of software. He had attended several sessions demonstrating nonlinear uses of laser discs. He knew what they could do. He did not translate that knowledge into his practice. Even with more structural supports than Oscar, San incorporated only the most conservative applications.

CONCLUSIONS AND IMPLICATIONS

This study examined 10 teachers over an extended time period to discover how they used technology and why they used it as they did. Like conclusions from other studies, the conclusions of this study support the centrality of the teacher in curriculum change and illustrate the challenges of introducing curriculum innovation into the classroom.(FN51)

Many technology enthusiasts have theorized that teacher acceptance of technology begins an evolutionary movement toward empowering students for learner-centered, higher-order inquiry.(FN52) They attribute resistance or co-optation of technology to teachers' failure to apprehend technology's potential and cite lack of positive empowering models as a contributing factor to this resistance.

The present findings indicate that adoption of empowering technology goals likely requires much more than information and structural supports. Adoption decisions may hinge on individual teachers' personalities and beliefs. Responses of Glenbrook teachers support findings from other studies that suggest that progressive or empowering educational beliefs of teachers may be necessary, but not sufficient, for them to embrace adventurous teaching.(FN53) Teachers with similar beliefs seem to vary in the amount of risk, ambiguity, and adventure they admit into their classrooms. Dispositional comfort with uncertainty may play a central role in teachers' decisions about technology.

Some advocates have argued that technology does not create major changes in instruction, but that it serves as a symbol for change that invites teachers to reexamine their general educational beliefs and practices.(FN54) These findings raise the possibility that individual teachers' receptivity to such an invitation may be part of their larger and personal patterns of response to uncertainty and change. If a VG disposition is a prerequisite for empowering educational adventure, the implications for revitalizing the curriculum through technology or other means are formidable. Can any curriculum implementation strategy be devised that is likely to convince substantial numbers of teachers to adopt empowering practices?

Findings corroborate conclusions by other researchers that teachers accept only changes that support good teaching as each teacher defines it.(FN55) Even though teachers' decisions may be deeply personal and individualized, individuals who are attracted to the profession are more likely to have beliefs and dispositions that cause them to define good teaching in a manner that conserves tradition rather than in a manner that challenges the status quo.(FN56) The slant toward the conservative, Accidental Tourist perspective exhibited by the majority of respondents in this study supports this interpretation.

Curriculum implementation initiatives based solely on the provision of information and organizational supports are unlikely to be adequate in moving many teachers to decide that "empowering adventure" is desirable. Individual differences in beliefs and dispositions reasonably mean that some teachers need very little support to undertake constructivist curriculum innovations. Other teachers, however, may never have enough support to begin such journeys because for them to teach in such a way would violate their essential needs and beliefs.(FN57)

This study was exploratory. Therefore, its findings are illuminative, not generalizable. The analyzed experiences of Glenbrook teachers reveal relationships, however, that merit exploration in other settings so that richer understandings about teacher responses to technology and other curriculum innovations may be developed. This case study also demonstrates the difficulties involved in the achievement of such understandings. Those difficulties notwithstanding, the teacher's continuing role as curricular gatekeeper necessitates continued exploration of the influences on teachers' innovation decisions. Without greater understanding of those decisions, educational leaders cannot address responsibly the complex issues surrounding efforts to foster students' adventurous learning.

Added material

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Research Association, Hilton Head, S.C.

Table 3. Characteristics of Teachers as Accidental Tourists and Voyageurs

	Accidental Tourists	Voyageurs
Personality characteristics	* Desire for predictability, control, structure * "I am the teacher; the student is the learner." * Serious Business orientation: no-nonsense mastery of practical, basic skills * Conserve time-honored standards for schooling	* High tolerance for uncertainty, experimentation * "We are all teachers; we are all learners." * Learning as Adventure orientation: learning as lifelong activity that occurs in all contexts * Question traditional methods and procedures
Classroom characteristics	* Lesson focus: Teacher-centered Lower-order thought Coverage-oriented Discrete facts * Climate: Structured Orderly Predictable Quiet	* Lesson focus: Student-centered Higher-order thought Process-oriented Integrated knowledge * Climate: Open Flexible Experimental Playful

Figure 1. Model of the Process of Teacher Acceptance and Use of Technology

FOOTNOTES

1 See C. Mojkowski, "Developing Technology Applications for Transforming Curriculum and Instruction," in Technology in Today's Schools, ed. C. Warger (Reston, VA: Association for Supervision and Curriculum Development, 1990), pp. 13-21; K. Sheingold, J. Hawkins, and C. Char, "'I'm the Thinkist, You're the Typist': The Interaction of Technology and the Social Life of Classrooms," in Computers and Learning, ed. O. Boyd-Barret and E. Scanlon (Workingham, England: Addison-Wesley, 1990), pp. 174-185; U.S. Congress, Office of Technological Assessment, How Teachers Use Technology: Power On! New Tools for Teaching and Learning (Washington, DC: U.S. Government Printing Office, 1988), pp. 89-90; R. Van Horn, "Educational Power Tools: New Instructional Delivery Systems, Phi Delta Kappan 72 (March 1991): 527-533.

2 K. Sheingold, J. Hawkins, and C. Char, "'I'm the Thinkist, You're the Typist': The Interaction of Technology and the Social Life of Classrooms," in Computers and Learning, ed. O. Boyd-Barret and E. Scanlon (Workingham, England: Addison-Wesley, 1990), pp. 174-185.

3 L. Ehman and A. Glenn, "Interactive Technology in Social Studies," in Handbook of Research on Social Studies Teaching and Learning, ed. J. Shaver (New York: Macmillan, 1991), pp. 513-522.

4 Educational technology is defined broadly to include electronic technology ranging from tape recorders to computer-based multimedia.

5 See D. K. Cohen, "Educational Technology and School Organization," in Technology in Education: Looking Toward 2020, ed. R. Nikerson and P. Zodhiates (Hillsdale, NJ: Lawrence Erlbaum Associates, 1988), pp. 231-264; D. K. Cohen, "Teaching Practice: Plus que ca Change ...," in Contributing to

Educational Change, ed. P. Jackson (Berkeley, CA: McCutchan, 1988), pp. 27-84; L. Cuban, How Teachers Taught (New York: Longmans, 1984); D. Lortie, Schoolteacher: A Sociological Study (Chicago: University of Chicago Press, 1975); K. Sheingold, J. Hawkins, and C. Char, "'I'm the Thinkist, You're the Typist': The Interaction of Technology and the Social Life of Classrooms," in Computers and Learning, ed. O. Boyd-Barret and E. Scanlon (Workingham, England: Addison-Wesley, 1990), pp. 174-185.

6 L. Cuban, Teachers and Machines: Classroom Use of Technology Since 1920 (New York: Teachers College Press, 1986); W. Doyle and G. Ponder, "The Practicality Ethic in Teacher Decision-making," Interchange 8 (1977-78); 1-12; T. Guskey, "Attitude and Perceptual Change in Teachers," in International Journal of Educational Research 13 (1989): 439-453; P. Jackson, Life in Classrooms (New York: McGraw -Hill, 1968); D. Lortie, Schoolteacher: A Sociological Study (Chicago: University of Chicago Press, 1975); R. Parish and R. Arends, "Why Innovative Programs Are Discontinued," Educational Leadership 40 (January 1983): 62-66; W. Waller, The Sociology of Teaching (New York: Russell and Russell, 1961); H. Wolcott, Teachers Versus Technocrats: An Educational Innovation in Anthropological Perspective (Eugene, OR: University of Oregon Press, 1977).

7 J. J. Schwab, "The Practical 3: Translation into Curriculum," School Review 81 (April 1973): 501-522.

8 H. L. Caswell, Curriculum Improvement in Public School Systems (New York: Teachers College Press, 1950).

9 Ibid. Similar conclusions about the teacher culture have been drawn in W. Waller, The Sociology of Teaching (New York: Russell and Russell, 1961) and D. Lortie, Schoolteacher: A Sociological Study (Chicago: University of Chicago Press, 1975).

10 See J. Snyder, F. Bolin, and K. Zumwalt, "Curriculum Implementation," in Handbook of Research on Curriculum, ed. P. Jackson (New York: Macmillan, 1992), pp. 402-435.

11 See E. House, "Technology Versus Craft: A Ten Year Perspective on Innovation," Journal of Curriculum Studies 11 (January 1979): 1-15; J. Olson, Understanding Teaching (Philadelphia: Open University Press, 1992); L. Smith, P. Kleine, J. Prunty, and D. Dwyer, "School Improvement and Educator Personality: Stages, Types, Traits or Processes?" in Studying Teachers' Lives, ed. I. I. Goodson (New York: Teachers College Press, 1992), pp. 153-166.

12 See, for example, M. Fullan and A. Pomfret, "Research on Curriculum and Instruction Implementation," in Review of Educational Research 47 (Spring 1977): 335-397; G. Hall and S. Loucks, "A Developmental Model for Determining Whether the Treatment Is Actually Implemented," American Educational Research Journal 14 (Fall 1977): 263-276; M. Huberman, "School Improvement Strategies That Work: Some Scenarios," Educational Leadership 41 (December 1983): 23-27.

13 See, for example, T. Becher and S. Maclure, The Politics of Curriculum Change (London: Hutchinson, 1978); P. Berman and E. Pauley, Federal Programs Supporting Educational Change. Vol. II: Factors Affecting Change Agent Projects (Santa Monica, CA: Rand, 1975); E. House, The Politics of Educational Innovation (Berkeley, CA: McCutchan, 1974).

14 See, for example, S. Sarason, The Culture of the School and the Problem of Change (Boston: Allyn and Bacon, 1971); L. Smith and P. Keith, Anatomy of Educational Innovation (New York: John Wiley, 1971); H. Wolcott, Teachers Versus Technocrats: An Educational Innovation in Anthropological Perspective (Eugene, OR: University of Oregon Press, 1977).

15 See, for example, R. Butt, D. Raymond, G. McCue, and L. Yamagishi, "Collaborative Autobiography and the Teacher's Voice," in Studying Teachers' Lives, ed. I. I. Goodson (New York: Teachers College Press, 1992), pp. 51-98; L. Smith, P. Kleine, J. Prunty, and D. Dwyer, "School Improvement and Educator Personality: Stages, Types, Traits or Processes?" in Studying Teachers'

Lives, ed. I. I. Goodson (New York: Teachers College Press, 1992), pp. 153-166.

16 See, for example, W. Doyle and G. Ponder, "The Practicality Ethic in Teacher Decision-making," Interchange 8 (1977-78): 1-12; F. Elbaz, "The Teacher's Practical Knowledge: Report of a Case Study," Curriculum Inquiry 11 (January 1981): 43-71; D. Kagan, "Ways of Evaluating Teacher Cognition: Inferences Concerning the Goldilocks Principle," Review of Educational Research 60 (Fall 1990): 419-469; J. Nespor, "The Role of Beliefs in the Practice of Teaching," Journal of Curriculum Studies 19 (April 1987): 317-328.

17 J. Nespor, "The Role of Beliefs in the Practice of Teaching," Journal of Curriculum Studies 19 (April 1987): 317-328; R. Shavelson and S. Stern, "Research on Teachers' Pedagogical Thoughts, Judgments, Decisions, and Behavior," Review of Educational Research 51 (Winter 1981): 455-498.

18 J. Nespor, "The Role of Beliefs in the Practice of Teaching," Journal of Curriculum Studies 19 (April 1987): 317-328.

19 See, for example, A. Bussis, F. Chittenden, M. Amarel, Beyond Surface Curriculum (Boulder, CO: Westview, 1976); C. Clark and P. Peterson, "Teacher Thought Processes," in Handbook of Research on Teaching, ed. M. Wittrock (New York: Macmillan, 1987), pp. 255-296; G. Duffy, "A Study of Teacher Conceptions of Reading" (paper presented at the National Reading Conference, New Orleans, 1977).

20 L. Smith, P. Kleine, J. Prunty, and D. Dwyer, "School Improvement and Educator Personality: Stages, Types, Traits or Processes?" in Studying Teachers' Lives, ed. I. I. Goodson (New York: Teachers College Press, 1992), pp. 153-166.

21 P. Schlechty, "On the Frontier of School Reform with Trailblazers, Pioneers, and Settlers," Journal of Staff Development 14 (Fall 1993): 46-51.

22 M. Rokeach, The Open and Closed Mind (New York: Basic Books, 1960).

23 H. Day and D. Berlyne, "Intrinsic Motivation," in Psychology and Educational Practice, ed. G. Lesser (Glenview, IL: Scott Foresman, 1971), pp. 294-335.

24 D. Keirsey and M. Bates, Please Understand Me: Character and Temperament Types (Del Mar, CA: Prometheus Nemesis Books, 1984); G. Lawrence, People Types and Tiger Stripes (Gainesville, FL: Center for Applications of Psychological Type, 1984); I. Myers and M. McCaulley, A Guide to the Development and Use of the Myers-Briggs Type Indicator (Palo Alto, CA: Consulting Psychological Press, 1985).

25 Y. Katz, "Toward a Personality Profile of a Successful Computer-using Teacher," Educational Technology 32 (February 1992): 39-41.

26 J. Nespor, "The Role of Beliefs in the Practice of Teaching," Journal of Curriculum Studies 19 (April 1987): 317-328.

27 H. Day and D. Berlyne, "Intrinsic Motivation," in Psychology and Educational Practice, ed. G. Lesser (Glenview, IL: Scott Foresman, 1971), pp. 294-335.

28 Ibid.; M. Rokeach, The Open and Closed Mind (New York: Basic Books, 1960).

29 A. Bussis, F. Chittenden, M. Amarel, Beyond Surface Curriculum (Boulder, CO: Westview, 1976); J. Snyder, F. Bolin, and K. Zumwalt, "Curriculum Implementation," in Handbook of Research on Curriculum, ed. P. Jackson (New York: Macmillan, 1992), pp. 402-435.

30 M. Honey and B. Moeller, Teachers' Beliefs and Technology Integration: Different Values, Different Understandings, Technical Report No. 6 (New York: Center for Technology in Education, 1990).

31 Pseudonyms are used for the school and for all respondents.

32 Numerous theorists have advanced rationales for student empowerment. See, for example, J. Dewey, Experience and Education (New York: Macmillan, 1938); F. Newmann, "Higher Order Thinking in the Teaching of Social Studies: Connections Between Theory and Practice," in Informal Reasoning and

Education, ed. J. Voss, D. Perkins, and J. Segal (Hillsdale, NJ: Lawrence Erlbaum, 1991), pp. 381-400; G. Brooks and M. Brooks, The Case for Constructivist Classrooms (Alexandria, VA: Association for Supervision and Curriculum Development, 1993).

33 M. Patton, How to Use Qualitative Methods in Evaluation (Newbury Park, CA: Sage, 1992), p. 55.

34 See L. Finkel, "Moving Your District Toward Technology: It's a Bit Easier Now That We Know Many of the Don'ts!" in Computers in Education, ed. J. Hirschbuhl and L. Wilkinson (Guilford, CT: Dushkin, 1992), pp. 130-131. A full discussion of the Glenbrook technology program and its critical success factors appears in J. Saye, Teachers, Technology, and the Acceptance of Innovation (unpublished doctoral dissertation, University of Georgia, 1994).

35 For complete descriptions of interviews and copies of interview guides, see J. Saye, Teachers, Technology, and the Acceptance of Innovation (unpublished doctoral dissertation, University of Georgia, 1994).

36 For discussion of these techniques, see B. Glaser and A. Strauss, The Discovery of Grounded Theory: Strategies for Qualitative Research (Chicago: Aldine, 1967); J. Goetz and M. LeCompte, Ethnography and Qualitative Design in Educational Research (San Diego, CA: Academic Press, 1984); M. Patton, How to Use Qualitative Methods in Evaluation (Newbury Park, CA: Sage, 1992).

37 B. Glaser and A. Strauss, The Discovery of Grounded Theory: Strategies for Qualitative Research (Chicago: Aldine, 1967).

38 M. Patton, How to Use Qualitative Methods in Evaluation (Newbury Park, CA: Sage, 1992), p. 55.

39 J. Goetz and M. LeCompte, Ethnography and Qualitative Design in Educational Research (San Diego, CA: Academic Press, 1984).

40 For a full description of pattern analysis of Phase II (teacher) and Phase III (student) interview data, see J. Saye, Teachers, Technology, and the Acceptance of Innovation (unpublished doctoral dissertation, University of Georgia, 1994).

41 While supporting the initial model, confirmatory phases also suggested other influences on teacher technology decisions. Ultimately, the generative process led beyond the model reported here to the consideration of several areas of teacher beliefs and to a broader theory for teacher practice decisions. See J. Saye, Teachers, Technology, and the Acceptance of Innovation (unpublished doctoral dissertation, University of Georgia, 1994); J. Saye, Teacher Response to Innovation: A Theoretical Model for Explaining Differences in Teachers' Classroom Decisions (manuscript submitted for publication, 1996).

42 For a fuller discussion of these factors, see J. Saye, Teachers, Technology, and the Acceptance of Innovation (unpublished doctoral dissertation, University of Georgia, 1994).

43 See, for example, P. Chandra, J. Bliss, and M. Cox, "Introducing Computers into a School: Management Issues," Computers and Education 12 (1988): 57-61; M. Honey and B. Moeller, Teachers' Beliefs and Technology Integration: Different Values, Different Understandings, Technical Report No. 6 (New York: Center for Technology in Education, 1990); J. Olson, Schoolworlds/Microworlds: Computers and the Culture of the Classroom (New York: Pergamon, 1988); M. Reed, "Teachers' Attitudes Toward Educational Computing: Instructional Uses, Misuses, and Needed Improvement," Computers in the Schools 3, no. 2 (1986):73-80; M. Wiske and P. Zodhiates, How Technology Affects Teaching (Cambridge, MA: Educational Technology Center, Harvard Graduate School of Education, 1988).

44 See, for example, W. Doyle and G. Ponder, "The Practicality Ethic in Teacher Decision-making," Interchange 8 (1977-78):1-12; D. Lortie, Schoolteacher: A Sociological Study (Chicago: University of Chicago Press, 1975); J. Nias, "The Life Cycle of the Teacher," in Teachers' Lives and Careers, ed. S. Ball and I. Goodson (London: Falmer Press, 1985), pp. 27-60.

45 W. Doyle and G. Ponder, in "The Practicality Ethic in Teacher Decision-making," propose a similar

influence on teacher decisions as one aspect of a construct they label congruence: the compatibility of an innovation with "self-image and preferred mode of relating to students."

46 A. Tyler, The Accidental Tourist (New York: Alfred A. Knopf, 1985).

47 See D. K. Cohen, "Teaching Practice: Plus Que ca Change ...," in Contributing to Educational Change, ed. P. Jackson (Berkeley, CA: McCutchan, 1988), pp. 27-84; A. Collins, "The Role of Computer Technology in Restructuring Schools," in Restructuring for Learning with Technology, ed. K. Sheingold and M. Tucker (New York: Center for Technology in Education and the National Center on Education and the Economy, 1990), pp. 29-46.

48 See W. Doyle and G. Ponder, "The Practicality Ethic in Teacher Decision-making," Interchange 8 (1977-78): 1-12. The explanations of both AT and VG teachers are consistent with a second element of Doyle and Ponder's construct of congruence: the extent to which a proposed innovation fits the way a teacher normally conducts classroom activities.

49 J. Saye, Teacher Response to Innovation: A Theoretical Model for Explaining Differences in Teachers' Classroom Decisions (manuscript submitted for publication, 1996).

50 For example, W. Doyle and G. Ponder, in "The Practicality Ethic in Teacher Decision-making," note that all elements of their congruence construct serve a conserving function in maintaining traditional classroom procedures. D. Lortie, in Schoolteacher, argues that most teachers exhibit a conservative frame of mind: a preference for doing things as they have been done in the past.

51 See, for example, H. L. Caswell, Curriculum Improvement in Public School Systems (New York: Teachers College Press, 1950); D. K. Cohen, "Teaching Practice: Plus Que ca Change ...," in Contributing to Educational Change, ed. P. Jackson (Berkeley, CA: McCutchan, 1988), pp. 27-84; L. Cuban, How Teachers Taught (New York: Longmans, 1984); D. Lortie, Schoolteacher: A Sociological Study (Chicago: University of Chicago Press, 1975); J. J. Schwab, "The Practical 3: Translation into Curriculum," School Review 81 (April 1973): 501-522; K. Sheingold, J. Hawkins, and C. Char, "'I'm the Thinkist, You're the Typist': The Interaction of Technology and the Social Life of Classrooms," in Computers and Learning, ed. O. Boyd-Barret and E. Scanlon (Workingham, England: Addison-Wesley, 1990), pp. 174-185.

52 See, for example, A. Collins, "The Role of Computer Technology in Restructuring Schools," in Restructuring for Learning with Technology, ed. K. Sheingold and M. Tucker (New York: Center for Technology in Education and the National Center on Education and the Economy, 1990), pp. 29-46; D. Dwyer, C. Ringstaff, and J. Sandholtz, "Changes in Teachers' Beliefs and Practices in Technology-rich Classrooms," Educational Leadership 48 (May 1991): 45-52.

53 See, for example, M. Honey and B. Moeller, Teachers' Beliefs and Technology Integration: Different Values, Different Understandings, Technical Report No. 6 (New York: Center for Technology in Education, 1990).

54 See, for example, C. Ringstaff, J. Sandholtz, and D. Dwyer. "Trading Places: When Teachers Utilize Student Expertise in Technology-Intensive Classrooms" (paper presented at the annual meeting of the American Educational Research Association, Chicago, 1991).

55 See, for example, L. Cuban, Teachers and Machines: Classroom Use of Technology Since 1920 (New York: Teachers College Press, 1986); W. Doyle and G. Ponder, "The Practicality Ethic in Teacher Decision-making," Interchange 8 (1977-78): 1-12; T. Guskey, "Attitude and Perceptual Change in Teachers," International Journal of Educational Research 13 (1989): 439-453; P. Jackson, Life in Classrooms (New York: McGraw-Hill, 1968); D. Lortie, Schoolteacher: A Sociological Study (Chicago: University of Chicago Press, 1975); R. Parish and R. Arends, "Why Innovative Programs Are Discontinued," Educational Leadership 40 (January 1983): 62-66; W. Waller, The Sociology of Teaching

(New York: Russell and Russell, 1961); H. Wolcott, Teachers Versus Technocrats: An Educational Innovation in Anthropological Perspective (Eugene, OR: University of Oregon Press, 1977).

56 See, for example, H. Day and D. Berlyne, "Intrinsic Motivation," in Psychology and Educational Practice, ed. G. Lesser (Glenview, IL: Scott Foresman, 1971), pp. 294-335; D. Keirsey and M. Bates, Please Understand Me: Character and Temperament Types (Del Mar, CA: Prometheus Nemisis Books, 1984); D. Lortie, Schoolteacher: A Sociological Study (Chicago: University of Chicago Press, 1975); M. Rokeach, The Open and Closed Mind (New York: Basic Books, 1960); S. Sarason, The Culture of the School and the Problem of Change (Boston: Allyn and Bacon, 1971); L. Smith, P. Kleine, J. Prunty, and D. Dwyer, "School Improvement and Educator Personality: Stages, Types, Traits or Processes?" in Studying Teachers' Lives, ed. I. I. Goodson (New York: Teachers College Press, 1992), pp. 153-166; H. Wolcott, Teachers Versus Technocrats: An Educational Innovation in Anthropological Perspective (Eugene, OR: University of Oregon Press, 1977).

57 See, for example, A. Bussis, F. Chittenden, and M. Amarel, Beyond Surface Curriculum (Boulder, CO: Westview, 1976); C. Clark and P. Peterson, "Teacher Thought Processes," in Handbook of Research on Teaching, ed. M. Wittrock (New York: Macmillan, 1987), pp. 255-296; M. Honey and B. Moeller, Teachers' Beliefs and Technology Integration: Different Values, Different Understandings, Technical Report No. 6 (New York: Center for Technology in Education, 1990); D. Kagan, "Ways of Evaluating Teacher Cognition: Inferences Concerning the Goldilocks Principle," Review of Educational Research 60 (Fall 1990): 419-469; D. Keirsey and M. Bates, Please Understand Me: Character and Temperament Types (Del Mar, CA: Prometheus Nemisis Books, 1984); J. Nespor, "The Role of Beliefs in the Practice of Teaching," Journal of Curriculum Studies 19 (April 1987): 317-328; L. Smith, P. Kleine, J. Prunty, and D. Dwyer, "School Improvement and Educator Personality: Stages, Types, Traits or Processes?" in Studying Teachers' Lives, ed. I. I. Goodson (New York: Teachers College Press, 1992), pp. 153-166.

TABLE 1. DATA COLLECTION FOR THE GLENBROOK STUDY

Phases I and II:

Ten teachers and two administrators were interviewed for one hour using an interview guide. All high school teachers of language, science, social studies, mathematics, and computer science took part. Five teachers and two administrators were interviewed in the exploratory study, Phase I; the remainder of the teacher set was interviewed in Phase II.

Phase III:

A purposive sample of nine seniors was selected for interviews based upon length of enrollment (at least three years). An interview guide similar to that used with teachers was employed.

Phase IV:

Three teachers' classes were observed over a three-month period to compare observed practice with teacher reports. Five other teachers were observed in at least two class sessions. One-hour follow-up interviews and a brief survey were conducted with all eight teachers.

Examination of Documents:

Mission statement, handbooks, schedules, handouts, student evaluations, projects, etc., were examined throughout the study.

TABLE 2. TEACHERS' GOALS FOR TECHNOLOGY USE

Control--Helps teacher maintain order and structure. Teacher controls the sequence, pace, and presentation of material.

Empowerment--Encourages exploration, creativity, and discovery. Student is given control of sequence, pace, and presentation of material.

Enrichment--Presents material that otherwise could not have been presented, or not presented as

dramatically or realistically. Shows concepts and abstractions more vividly. Unifies, ties ideas together.

Efficiency--Reduces the amount of time devoted to administrative tasks. Replaces teacher in drill and practice routines. Increases speed and reliability of student performance.

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